



**C&S Engineers, Inc.**  
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# Remedial Investigation Work Plan

**Former Erie Rail Yard Site  
250 Baitz Avenue and 1000 Bailey Avenue  
City of Buffalo, Erie County, New York  
BCP Site No. C915416**

**Prepared for:**  
UDC-BCC North Buffalo, LLC  
100 Corporate Parkway Suite 500  
Amherst, NY 14226

April 2026

C&S Project No. 179B001001



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**Prepared by:**  
C & S Engineers, Inc.  
Elm Street  
Buffalo, New York 14203

I, H. Nevin Bradford, III, certify that I am currently a NYS Registered Professional Engineer and that this Remedial Investigation Work Plan was prepared in accordance with applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

H. Nevin Bradford III  
State of New York Professional Engineer No. 086008

STAMP

April 10, 2026

C&S Project#: 179B001001

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## ACRONYMS

<b>AGV</b> – Air Guidelines Value	<b>PBS</b> – Petroleum Bulk Storage
<b>ASP</b> – Analytical Services Protocol	<b>PCB</b> – Polychlorinated biphenyl
<b>AST</b> – Aboveground Storage Tank	<b>PCE</b> – Tetrachloroethene
<b>ASTM</b> – American Society for Testing Materials	<b>PFAS</b> – Per- and polyfluoroalkyl substances
<b>AUL</b> – Activity and Use Limitation	<b>Phase I ESA</b> – Phase I Environmental Site Assessment
<b>BCP</b> – Brownfield Cleanup Program	<b>Phase II ESA</b> – Phase II Environmental Site Assessment
<b>BGS</b> – Below Ground Surface	<b>PID</b> – Photoionization Detector
<b>CP-51</b> – Commissioner Policy 51	<b>PPB</b> – Parts Per Billion
<b>DER</b> – Department of Environmental Remediation	<b>PPM</b> – Parts Per Million
<b>DUSR</b> – Data Usability Summary Report	<b>PVC</b> – Polyvinyl Chloride
<b>BTEX</b> – Benzene, Toluene, Ethylbenzene, Xylene	<b>QA/QC</b> – Quality Assurance / Quality Control
<b>EDD</b> – Electronic Data Deliverable	<b>REC</b> – Recognized Environmental Condition
<b>ELAP</b> – Environmental Laboratory Accreditation Program	<b>SC</b> – Site Characterization
<b>EP</b> – Environmental Professional	<b>SCO</b> – Soil Cleanup Objective
<b>FEMA</b> – Federal Emergency Management Agency	<b>SCWP</b> – Site Characterization Work Plan
<b>GIS</b> – Geographic Information System	<b>Site</b> – 250 Baitz Avenue and 1000 Bailey Avenue, Buffalo, NY
<b>GPR</b> – Ground Penetrating Radar	<b>SSDS</b> – Sub-Slab Depressurization System
<b>GPS</b> – Global Positioning Satellite	<b>SVOC</b> – Semi-volatile Organic Compound
<b>HASP</b> – Health and Safety Plan	<b>TAL</b> – Target Analyte List
<b>HFM</b> – Historic Fill Material	<b>TCE</b> – Trichloroethene
<b>HREC</b> – Historical Recognized Environmental Condition	<b>TCL</b> – Target Compound List
<b>IRM</b> – Interim Remedial Measure	<b>TCLP</b> – Toxicity Characteristic Leaching Procedure
<b>MS / MSD</b> – Matrix Spike / Matrix Spike Duplicate	<b>TOGS</b> – Technical and Operational Series Guidance
<b>MSL</b> – Mean Sea Level	<b>TPH</b> – Total Petroleum Hydrocarbon
<b>MW</b> – Monitoring Well	<b>ug/l</b> – Micrograms per liter
<b>NAPL</b> – Non-Aqueous Phase Liquid	<b>µg/M<sup>3</sup></b> – Micrograms per Cubic Meter
<b>NFA</b> – No Further Action	<b>USDA</b> – United States Department of Agriculture
<b>NYSDEC</b> – New York State Department of Environmental Conservation	<b>USEPA</b> – United States Environmental Protection Agency
<b>NYSDOH</b> – New York State Department of Health	
<b>PAH</b> – Polycyclic Aromatic Hydrocarbon	



**USGS** – United States Geological Service

**UST** – Underground Storage Tank

**VI** – Vapor Intrusion

**VIA** – Vapor Intrusion Assessment

**VOC** – Volatile Organic Compound



## EXECUTIVE SUMMARY

This document presents the Remedial Investigation (RI) Work Plan for the Former Erie Rail Yard Site Brownfield Cleanup Program Site located at 250 Baitz Avenue and 1000 Bailey Avenue, Buffalo, New York (the "Site"). The project details are summarized below:

### Contaminant Source and Constituents

Environmental information currently exists for the Site from a Phase I Environmental Site assessment dated December 2023, Geotechnical Investigation Report dated April 2024, and a Pre-BCP Investigation conducted in August 2024. The subsurface investigations have identified semi-volatile organic compounds (SVOCs) and metals in concentrations that exceed commercial end use soil cleanup objectives (SCO). The elevated concentrations appear to be associated with historic railroad activity and historic fill material (HFM) on the Site.

### Extent of Known Contamination

Based on the information gathered to date, HFM is present from three to eight feet below ground surface (bgs). Documented contamination is present across the Site in both surface soil and subsurface soil from approximately two inches to one foot bgs. Surface soil contamination is fairly homogeneous across the Site while subsurface soil contamination appears to be more prevalent in western portion of the Site.

### Proposed Site Redevelopment

The anticipated post remediation use of the site is a new Department of Public Works for the City of Buffalo. This will include two large garages, an auto impound building, multiple areas of mechanical service, a sanitation garage, a yard waste area, a snow dump area, a salt barn, asphalt pavement parking, and roadway areas. Future expansion includes two solar farms in the western portion of the Site.

### 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 surface soil, native soil, fill material, and groundwater.

### Interim Remedial Measures

Interim Remedial Measures (IRM) may be proposed based on the results of the RI.

### Cleanup Track



UDC-BCC North Buffalo, LLC proposes to remediate the Site by pursuing a Track 4 cleanup to Commercial Use criteria using the Soil Cleanup Objectives at 6 NYCRR Part 375-6.

## INTRODUCTION

This Remedial Investigation (RI) Work Plan provides a description of the procedures that will be implemented to characterize the nature and extent of contamination at the Former Erie Rail Yard Site (the “Site”) and the proposed methods to address that contamination. This RI Work Plan has been prepared consistent with Division of Environmental Remediation “Technical Guidance for Site Investigation and Remediation” (DER-10). To effectively characterize the environmental conditions, this RI 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

On October 31, 2025, UDC-BCC North Buffalo, LLC, as a Brownfield Cleanup Program (BCP) Volunteer, submitted a BCP Application to investigate and remediate the Site. A fully executed Brownfield Agreement (BCA) was provided on March 23, 2026.

The Site was previously used as a series of rail lines and rail car maintenance from approximately 1894 to 1974. The roundhouse and other structures on the Site have been demolished and the Site is now vacant except for a small, dilapidated shed in the southeastern portion of the Site and some remaining rail lines and ties throughout. The development of the Site will consist of a new Department of Public Works for the City of Buffalo. This will include two large garages, an auto impound building, multiple areas of mechanical service, a sanitation garage, a yard waste area, a snow dump area, a salt barn, asphalt pavement parking, and roadway areas.

An RI will be implemented to further evaluate the extent of the contamination and to aid in the preparation of an Alternatives Analysis Report (AAR). **Section 4.0** describes the scope of the investigation during remediation.

### 1.1 Site Description

The Former Erie Rail Yard Site is located at 250 Baitz Avenue and 1000 Bailey Avenue in the City of Buffalo, Erie County, New York. The Site is comprised of two contiguous tax parcels (Tax Map ID Nos. 112.18-1-1.12, and 112.18-1-1.13) which are bounded by Bailey Avenue, Clinton Street,

William Street, and New Babcock Street. The Site is approximately 60.322 acres and is owned by Norfolk Southern Railroad Company.

The Site is located in an urban portion of the City of Buffalo. The Site is currently vacant except for a small, dilapidated shed in the southeastern portion. Land uses immediately adjacent to the BCP Site include a mix of commercial, industrial, and residential uses.

**Figure 1** shows the location of the Site and **Figure 2** shows the Project Area and Site Boundaries.

## 1.2 Site History

According to historical records and past assessments, the Site has been used for railroad activity since at least 1894. Site operations included a rail corridor and rail car maintenance. Numerous rail lines, coal storage areas, support buildings, and a large roundhouse for rail car repair existed on the Site until approximately 1974, at which point the roundhouse and other larger structures were demolished.

The following table summarizes the historical and current operations on the Site based on the Phase I ESA:

**Table 1-1: Historical Site Occupants**

Years	Occupants
6/1/1999 – 8/9/2024	Pennsylvania Lines LLC
3/31/1976 – 6/1/1999	Consolidated Rail Corporation
6/20/1929 – 3/31/1976	Erie Railroad Company
12/13/1924 – 6/20/1929	Erie Land and Improvement Company)
1/26/1906 – 6/20/1929	Erie Land and Improvement Company
4/1/1901 – 6/20/1929	Erie Land and Improvement Company

The UDC-BCC North Buffalo, LLC took ownership of the Site on August 9, 2024.

## 1.3 Site Geography, Geology, and Hydrogeology

The Site is generally flat and is at an approximate elevation of 604 feet above mean sea level. The Site is approximately 2.5 miles east of Lake Erie. It is assumed that groundwater in the area moves to the west towards Lake Erie.

Surface soil on the Site consisted of brown to black sand and silt, ash, coal, and slag. The Site contains HFM from approximately three to eight feet bgs. HFM appeared to consist of black or brown fine to coarse-grained sand and gravel with varying amounts of silt, clay, slag, concrete, brick, construction lumber, and roots/organic matter. However, fill material can also contain any one or mixture of the following materials:

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

Additionally, a significant amount of old railroad ties were found a few inches bgs.

Native soil is located below HFM from eight feet bgs, down to at least 14 - 20 feet bgs and consists of plastic silty clay with trace amounts of sand and gravel.

Buffalo Drilling Company installed three monitoring wells as part of a geotechnical investigation at the Site. Groundwater levels were recorded following installation on February 6, 14, and 15, 2024, and ranged from approximately 12 to 18 feet below ground surface (bgs).

Monitoring well development was conducted on March 26, 2024, at which time static groundwater levels were observed at depths ranging from approximately 2 to 12 feet bgs. These observations suggest a southeasterly groundwater flow direction and indicate the presence of two distinct groundwater regimes.

The first consists of a shallow, perched water table associated with an upper granular fill layer overlying a less permeable silty clay unit. This condition appears to be localized and potentially seasonal, and is represented by monitoring wells MW-01 and MW-25.

The second groundwater regime, identified at monitoring well MW-30, occurs at greater depth near the till/bedrock interface and exhibits minor artesian conditions. This deeper groundwater zone was not evident until the dense to hard glacial till unit was fully penetrated.

**Table 1-2** presents water level measurements.

**Table 1-2: Groundwater Elevations**

Well No.	Ground Elevation	Depth	Elevation
<b>Date</b>	--	<b>3/26/2024</b>	
<b>MW-01</b>	607.0	4.8	602.2
<b>MW-25</b>	601.0	2.0	599.0
<b>MW-30</b>	599.0	12.3	586.7

Notes:

- All units in feet.
- NP = Not Present
- NS = Not Sampled



The primary drinking water source for the City of Buffalo is Lake Erie. Water processed in the City of Buffalo Water Authority potable water plants for the City of Buffalo undergoes varying levels of treatment to ensure that drinking water meets NYSDEC and United States Environmental Protection Agency (USEPA) standards. Groundwater in the City of Buffalo is prohibited from being used for public drinking water supply.

## 2.0 SUMMARY OF ENVIRONMENTAL CONDITIONS

### 2.1 Environmental Reports

Environmental information currently exists via the completion of the following reports:

- C&S Engineers, Inc., *Phase I Environmental Site Assessment*, December 2023
- Barron & Associates, P.C., *Geotechnical Engineering Report*, April 2024
- C&S Engineers, Inc. *Pre-BCP Investigation*, August 2024

The following summarizes those efforts. These reports are provided in **Appendix A**.

#### **C&S Engineers, Inc. Phase I Environmental Site Assessment - December 2023**

The Phase I ESA was prepared by C&S Engineers, Inc. to identify any potential Recognized Environmental Conditions (RECs) associated with previous industrial activity at the Site. The Phase I investigation identified the following:

- The Site was primarily used as a series of rail lines and rail car maintenance hub from at least 1894 until 1974. The following were determined to be RECs:
  - The historical use of the Site for railroad purposes, especially maintenance related facilities occurring in the roundhouse.
  - The historical use of adjoining and proximate properties for industrial facilities including manufacturing, shipping and transportation companies, auto repair and filling stations, and tire shops.
  - Federal databases identified a record of a train derailment on the Site resulting in more than 2,000 gallons of fuel spilled as the train continued travelling over 100 feet.
- Although not designated as RECs, C&S deemed the following de minimis conditions worth mentioning:
  - The use of arsenic-based herbicides for vegetation control along historic rail lines as well as creosote-based treatment for the railroad ties to prevent decay due to the possibility of polyaromatic hydrocarbons (PAHs) leaching.
  - Multiple leaking storage tanks, spills, and Brownfields near the Site that have been cleaned up and closed.
  - Piles of railroad ties, various metal railroad materials, and large amounts of miscellaneous debris across the Site.
- There were six entries identified in the federal database on the Site. They are as follows:

- New Buffalo Industrial Park located at South Ogden, Dingens, Bailey - SHWS
- U.S Sugar located at 692 Bailey Ave. – LST, FINDS / FRS, GEN MANIFEST, RCRA SQG
- Pride Transport located at 692 Bailey Ave. – NY SPILLS
  
- There were 506 entries identified in the federal database within a one-mile radius of the Site. Some of the databases with higher numbers of entries are below:
  - 103 NY SPILLS entries
  - 61 LST entries
  - 31 GEN MANIFEST entries
  - 29 HSWDS entries
  - 27 UST entries
  - 24 SWF/LF entries
  - 17 PFAS IND entries
  - 16 CERCLIS entries
  - 16 SHWS entries
  - 6 BROWNFIELDS entries

#### **Barron & Associates, P.C., Geotechnical Engineering Report - April 2024**

In January 2024, Buffalo Drilling Company performed a geotechnical investigation of the Site. A total of 30 soil borings were advanced from ground surface to the top of bedrock. An ATV-mounted CME-550 rotary drill rig was used to auger each soil boring to refusal using 2-1/4 inch inside diameter (ID), continuous flight hollow stem augers. Samples were recovered by driving a standard split-spoon sampler (2-foot long by 1-3/8 inch inside diameter) 24 inches with a 140-pound hammer falling 30 inches per blow per the American Society of Testing and Materials (ASTM) Standard D1586. Samples were analyzed for particle size, moisture content in soil, and liquid limit, plastic limit, and plasticity index of soils.

Surface soil consists of a thin, indistinguishable topsoil layer. Below the surface soil, there is approximately three to eight feet of HFM appearing the consist of coarse-grained sand and gravel with trace amounts of silt, clay, slag, brick, lumber, and roots/organic matter. Below HFM, there is a layer of silty clay extending to approximately 14 feet bgs and glacial till extending to auger refusal, which was encountered from nine to 21 feet bgs.

Following the advancement of the borings, three monitoring wells were installed in borings B-1, B-25, and B-30. A few weeks later groundwater levels were measured and ranged from 12 to 18 feet bgs.

C&S was onsite to observe the drilling activities and scan the soils with the photoionization detector (PID). At the time, the railroad owned the property and C&S was not allowed to collect any samples on the Site during the railroad's ownership. No elevated PID readings were observed during drilling.

## **C&S Engineers, Inc. Pre-BCP Investigation - August 2024**

The Pre-BCP Investigation was completed by C&S Engineers, Inc. in August 2024 as a preliminary measure to identify contamination that may exist in the surface and subsurface soil on the Site. The Pre-BCP Investigation included the following efforts:

- The collection of 12 surface soil samples.
- The advancement of 12 soil borings.
- The collection of 12 subsurface samples.

Of the twelve surface soil samples collected, nine contained one or more SVOC / PAH in concentrations exceeding Commercial Use SCOs or higher and all twelve contained one or more metal in concentrations exceeding Commercial Use SCOs or higher. Of the twelve subsurface samples, six contained one or more SVOC / PAH with concentrations exceeding Commercial Use SCOs or higher and nine contained one or more metal with concentrations exceeding Commercial Use SCOs or higher.

Site characterization efforts conducted to assess contaminant concentrations at the Site are summarized on **Figure 3A** and **3B**.

### **2.1.1 Prior Remedial Events**

No remedial events are known to have been completed prior to Brownfield Cleanup Program sampling.

## **2.2 Nature and Extent of Contamination**

Based on historical information and previous environmental investigations, the Site and surrounding properties were used for commercial and industrial purposes from at least 1894 through 1974. Historical uses included rail lines and rail car maintenance on-Site, with adjacent properties supporting manufacturing, fabrication, transportation, automotive repair, fueling stations, and tire-related operations. These activities, along with the placement and redistribution of historic fill material (HFM) during site redevelopment, are considered likely sources of contamination.

### **2.2.1 Subsurface Soil**

Investigations indicate that subsurface soils are impacted primarily by semi-volatile organic compounds (SVOCs), including polycyclic aromatic hydrocarbons (PAHs), and metals. Impacts are generally encountered at shallow depths, beginning at approximately 1 foot below ground surface (bgs), and are more pronounced across the larger parcel.

SVOCs were detected at concentrations exceeding applicable Soil Cleanup Objectives (SCOs) for Residential, Restricted Residential, Commercial, and Industrial use. The most significant impacts were identified in borings BH-07 through BH-11, with BH-10 and BH-11 exhibiting the highest concentrations. Detected compounds include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene, among others, with exceedances ranging from marginal to several orders of magnitude above Industrial Use SCOs.

Metals are also widespread in subsurface soils, with arsenic, copper, and lead frequently exceeding Restricted Residential, Commercial, and Industrial SCOs. Elevated concentrations of these metals were identified across multiple borings, indicating broadly distributed impacts consistent with historic industrial activities and fill material.

### **2.2.2 Surface Soil**

Surface soils (0 to 2 inches bgs) exhibit similar contaminant profiles, with widespread impacts from SVOCs/PAHs and metals. SVOC concentrations exceed Restricted Residential, Commercial, and Industrial SCOs across multiple sample locations, with the highest concentrations generally observed in samples SS-07 through SS-10. The same suite of PAHs identified in subsurface soils is present at the surface, indicating consistent contamination throughout the soil column.

Metals, including arsenic, copper, lead, and cadmium, are also present at concentrations exceeding applicable SCOs in surface soils. Arsenic exceedances are widespread across the Site, while elevated lead and copper concentrations are more localized but reach levels significantly above regulatory thresholds.

Overall, contamination at the Site is characterized by widespread PAH and metal impacts in both surface and shallow subsurface soils. Concentrations frequently exceed applicable SCOs across multiple SCOs, with the highest impacts associated with areas of historic industrial activity and HFM placement. The distribution and magnitude of contamination indicate that impacts are both laterally extensive and present at shallow depths, representing a consistent site-wide condition.

### 3.0 OBJECTIVES, SCOPE AND RATIONALE

The objectives of the scope of work described in this Work Plan are to evaluate contaminant impacts for the subsequent identification and evaluation of appropriate remedial actions necessary to redevelop the Site. The investigation work will include evaluating the nature and extent of contaminant 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 and subsequent AAR.

The RI is based on information previously gathered regarding historical operations conducted at the Site, the results of the subsurface investigations, and the project objectives. The RI will include the following:

#### 3.1 Soil Investigation

This task will consist of the following elements: surface soil, historic fill, and underlying native soil characterization.

- Surface soils will be characterized to assess the nature and extent of contamination in areas that are proposed to be pervious (e.g. grass and landscaped areas, or other areas not covered by pavement).
- HFM will be characterized to identify the nature and extent of contamination within the fill. Soil borings will be advanced on the exterior of the Site.
- The underlying native soils will be characterized to determine the depth of impacts from the overlying HFM and / or Site operations. Soil borings will be advanced on the exterior of the Site.

The locations of the proposed surface soil samples and soil borings are shown in **Figure 4**.

#### 3.2 Groundwater Investigation

Subsequent to completing soil investigation tasks, groundwater monitoring wells will be installed. Proposed well locations are shown on **Figure 5**. If field conditions observed during the RI require a significant change to the proposed locations, their adjusted locations will be discussed with the NYSDEC.

The RI activities will be completed consistent with NYSDEC Part 375-6 and NYSDEC Division of Environmental Remediation: Technical Guidance for Site Investigation and Remediation dated May 2010 (DER-10).

## 4.0 REMEDIAL INVESTIGATION

This part of the RI Work Plan describes the scope of investigative work necessary to collect sufficient data to determine the extent of contaminated fill material which will support a subsequent AAR and RWP in achieving **Commercial Use SCOs under Track 4**. This section of the RI Work Plan includes:

- Field Investigation
- Sampling Program
- Laboratory Analysis

### 4.1 Field Investigation

The RI is intended to supplement the previous subsurface investigation information by advancement of soil borings, installing monitoring wells, and collecting and analyzing soil and groundwater.

#### 4.1.1 Surface Soil Sampling

Surface soil samples will be collected and analyzed as follows:

**Table 4-1: Surface Soil Samples**

Matrix	Sampling Locations	Depth	Analysis	No. of Samples	Sampling Location Rationale
Surface Soil	Spatially across the Site as shown in <b>Figure 4</b> .	0 to 2 inches	Full Suite *	6	Areas not proposed to be "capped" with pavement or buildings.

\* Full suite = TCL VOCs, TCL SVOCs, pesticides, herbicides, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals including mercury, cyanide, and hexavalent chromium, per- and polyfluoroalkyl substances (PFAS), and 1,4-dioxane

QA / QC samples will be collected, and the following describes the number and type of samples.

**Table 4-2: Surface Soil QA / QC Samples**

No. Blind Duplicates	No. Equipment Blanks	No. Matrix Spikes (MS)	No. Matrix Spike Duplicates (MSD)
1	0	1	1

Blind Duplicates are at a rate of 1 per 10 samples (10%). Only 1 required for less than 20 samples.

Matrix Spikes are at a rate of 1 per 20 samples (5%) per matrix.

Matrix Spike Duplicates are at a rate of 1 per 20 samples (5%) per matrix.

Equipment blanks not required when utilizing disposable sampling / sample collection equipment (nitrile gloves, disposable sample spoons, etc.).

### 4.1.2 Soil Boring Program

The soil borings will be utilized for the construction of groundwater monitoring wells. Proposed exploration locations are shown on **Figure 4**.

Subsurface areas showing signs of impacts (staining, odors, free product, and measurable volatile vapors) will be further investigated. Soil sampling analytical data will be assessed, in consultation with NYSDEC and New York State Department of Health (NYSDOH) to determine the need for additional SVI sampling.

Each soil boring will be advanced into native material, up to 16 feet (ft) bgs or to the top of bedrock (whichever is shallower), or at the discretion of the project geologist and with consultation from NYSDEC. Borings will be advanced to assess the full depth of HFM or other contamination of impacted soils. Exploration locations will be located with a hand-held global positioning system (GPS) device or tape measured from existing site features.

Three soil boring locations will also be used for the construction of groundwater monitoring wells, as discussed in **Section 4.1.1**.

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 be continuously sampled in four- or five-foot intervals using a two-inch by four- or five-foot stainless 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 (e.g. staining), olfactory indications of impairment, evidence of non-aqueous phase liquids (NAPLs), and / or indication of detectable VOCs over 10 ppm with a 10.6 eV PID. Such evidence is collectively referred to as "evidence of impairment" and the results will be recorded on boring logs. The soil boring logs will also include soil description, PID readings, etc. The boring logs will be included in the RI Report.

### 4.1.3 Test Pit Program

Test pits will be excavated across the Site to facilitate the characterization of surface and shallow subsurface materials, including HFM and underlying native soils where present. Test pits will

supplement the soil boring program by providing direct visual observation of subsurface conditions and allowing for bulk soil sampling of shallow materials.

Test pits will be excavated using a conventional track-mounted excavator. Each test pit will be advanced to a maximum depth of approximately 10 feet below ground surface (bgs) or to the top of native soil, refusal, or groundwater, whichever is encountered first. Test pits will generally extend up to approximately 10 feet in length, as necessary to allow safe observation of subsurface conditions.

During excavation, soils will be continuously evaluated by a qualified environmental professional for evidence of potential contamination. Field screening will include visual and olfactory observations for staining, discoloration, stressed soils, petroleum odors, or other indicators of contamination. In addition, soil headspace will be screened for VOCs using a calibrated PID. Positive indications identified through visual observation, odor, or elevated PID readings will be collectively referred to as evidence of impairment.

Where evidence of impairment or other areas of concern are identified, additional observations and sampling may be conducted to further characterize the impacted material. Soil sampling from test pits will be biased toward material horizons exhibiting gross contamination, staining, discoloration, odors, or elevated PID readings. Supplemental samples may also be collected where field observations indicate potential impacts within the soil profile.

Test pit locations will be documented using a hand-held GPS device or by measurement from existing Site features. Following completion of excavation and sampling activities, test pits will be backfilled with the excavated material in the order removed, unless field conditions require alternative management.

Detailed test pit logs will be prepared for each excavation and will include, at a minimum, soil descriptions, estimated depth to native material, field screening results (including PID readings), and documentation of any observed evidence of impairment. Test pit logs will be included in the RI Report.

#### **4.1.3.1 Fill Sampling**

Fill samples will be collected from test pits based on evidence of impairment and to provide characterization across the Site. Fill samples will be collected based on evidence of impairment, spatial distribution, and fill type. At least one sample will be collected from each test pit where fill is encountered. Additional fill samples will be collected if separate fill layers or differing soil nature is encountered in the test pits. The fill samples will be collected and analyzed as shown in the table below.

#### **4.1.3.2 Native Soil Sampling**

Native soil will be visually assessed in each of the locations from its upper extent to at least 15 feet below ground surface in soil borings and up to a least 10 feet below ground surface in test pits. In order to assess the impact of fill and / or Site operations on the underlying native soil, soil samples will be collected from the top of native material. The soil samples will be collected and analyzed as shown in the table below.

Subsurface soil samples will be collected and analyzed as follows:

**Table 4-3: Subsurface Soil Samples**

<b>Matrix</b>	<b>Sampling Locations</b>	<b>Depth</b>	<b>Analysis</b>	<b>No. of Samples</b>	<b>Sampling Location Rationale</b>
Fill Material	Refer to <b>Figure 4.</b>	1-8 feet	Full Suite *	28	From test pits only. Site-wide focusing on the former roundhouse and ancillary railroad buildings
Native Soil	Refer to <b>Figure 4.</b>	9-10 feet	Full Suite *	5	Two locations around the former roundhouse. Three locations throughout the rest of the Site.
Fill Material / Native Soil	Refer to <b>Figure 4.</b>	5-12 feet	Full Suite *	3	Collected from the three new monitoring wells at the approximate water table.

\* Full suite = TCL VOCs, TCL SVOCs, pesticides, herbicides, PCBs, TAL metals including mercury, cyanide, and hexavalent chromium, PFAS, and 1,4-dioxane.

QA / QC samples will be collected, and the following describes the number and type of samples.

**Table 4-4: Subsurface Soil QA /QC Samples**

<b>No. Blind Duplicates</b>	<b>No. Equipment Blanks</b>	<b>No. Matrix Spikes (MS)</b>	<b>No. Matrix Spike Duplicates (MSD)</b>
1	0	1	1

Blind Duplicates are at a rate of 1 per 10 samples (10%). Only 1 required for less than 20 samples.

Matrix Spikes are at a rate of 1 per 20 samples (5%) per matrix.

Matrix Spike Duplicates are at a rate of 1 per 20 samples (5%) per matrix.

Equipment blanks not required when utilizing disposable sampling / sample collection equipment (macrocore liners, nitrile gloves, disposable sample spoons, etc)

#### **4.1.4 Groundwater Monitoring**

To characterize groundwater conditions at the Site, three new monitoring wells will be installed and three existing monitoring wells will be sampled. The wells will be installed from soil borings discussed in **Section 4.1.2** and sampled.

Overburden wells will be constructed to intersect the top of the water table. Each well will be completed with an appropriate length 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.

Following installation, the monitoring wells will be developed through the removal of up to ten well volumes using dedicated bailers or a peristaltic or submersible pump. Additional well volumes will be extracted, if necessary to document stabilization of water quality. The effluent will be monitored for temperature, dissolved oxygen, conductivity, oxidation / reduction potential, and turbidity and the effluent will be considered stabilized per the following criteria:

**Table 4-5: Groundwater Stabilization Criteria**

Parameter	Units	Stabilization Criteria
pH	Standard Units	± 0.1
Conductivity	mS/cm	± 3%
Turbidity	NTU	10% or < 10 NTU
D.O.	mg/L	10% or < 0.5 mg/L
Temperature	°F / °C	± 3%
ORP	mV	± 10

Groundwater sampling will follow well development and be conducted using low-flow purging and sampling techniques. Before purging the well, water levels will be measured using an electric water level sounder capable of measuring to the 0.01-foot accuracy. Peristaltic or bladder pumps using manufacturer-specified tubing will be used for purging and sampling groundwater. Sampling protocol and equipment will comply with the most current version of NYSDEC “Groundwater Sampling for Emerging Contaminants” guidance. In addition, calibration, purging and sampling procedures will be performed as specified by the USEPA<sup>1</sup> for low-flow sampling. Decontamination will be conducted after each well is sampled to reduce the likelihood of cross contamination. Calibration times, purging volumes, water levels and field measurements will be recorded in a field log and will be provided in the Remedial Investigation Report.

Samples will be collected and analyzed as follows:

**Table 4-6: Groundwater Samples**

Matrix	Sampling Location	Analysis	No. of Samples	Sampling Location Rationale
Groundwater	Refer to <b>Figure 4.</b>	Full Suite *	6 field samples	New well locations may be biased to the south of the Site. Final locations will be

<sup>1</sup> U.S. EPA Low Stress (low-flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, September 19, 2017.

			determined based on the test pit program.
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\* Full suite = TCL VOCs, TCL SVOCs, pesticides, herbicides, PCBs, TAL metals including mercury, cyanide, and hexavalent chromium, PFAS, and 1,4-dioxane.

Total and dissolved metals will be analyzed if the well effluent is greater than 50 NTUs.

100% of the wells will be analyzed for these parameters during the first round of sampling. If detected above a DEC guidance value, PFAS will be tested during the second round of sampling in the respective well.

QA / QC samples will be collected, and the following describes the number and type of samples.

**Table 4-7: Groundwater QA / QC Samples**

No. Blind Duplicates	VOC Trip Blank	PFAS Equipment Blanks	No. Matrix Spikes (MS)	No. Matrix Spike Duplicates (MSD)
2	1 per shipment, per day	1	2	2

Blind Duplicates are at a rate of 1 per 10 samples (10%). Only 1 required for less than 20 samples.

Matrix Spikes are at a rate of 1 per 20 samples (5%) per matrix.

Matrix Spike Duplicates are at a rate of 1 per 20 samples (5%) per matrix.

Equipment blanks not required when utilizing disposable sampling / sample collection equipment.

A second round of groundwater sampling will be performed one to two months after the first round. Except as noted above, the second round of groundwater samples will be analyzed for the same analytes as in the first round.

Drilling decontamination, development, and purge fluids will be collected, containerized, sampled and disposed consistent with DER-10 (Refer to **Section 4.3**).

## 4.2 Laboratory Analysis and Data Validation

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. The EDD for all media will be uploaded to the EQulS software application.

## 4.3 Investigation Derived Waste

Investigation-derived wastes (IDW) (i.e., grossly-contaminated soil cuttings and purge water) will be containerized or stockpiled and staged on-site, pending proper disposal at an offsite facility. Soil cuttings with no apparent staining, odors, or elevated PID readings will be used to backfill boring holes except for backfilling monitoring wells. Soil to be disposed off-site will be placed in steel 55-gallon drums or on poly sheets. Decontamination fluids, if necessary, will be placed in steel 55-gallon drums with closed tops. Drums will be properly labeled, sealed, and characterized



as necessary. Samples may be analyzed for toxicity characteristic leaching procedure (TCLP) VOCs, SVOCs, pesticides, herbicides, and metals; PCBs; pH (corrosivity), flash point (ignitability); reactivity; and paint filter (free liquids).

Discarded personal protective equipment (PPE) (i.e., latex gloves, Tyvek, paper towels, etc.) and disposable sampling equipment (i.e., bailers or stainless-steel spoons) will be placed in sealed plastic garbage bags and disposed of as municipal solid waste.

## 5.0 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. The project Quality Assurance Project Plan (QAPP) is provided in **Appendix E**.

During the RI the NYSDEC may split any waste, soil, groundwater, or air sample.

### 5.1 Sampling Methods

Sampling procedures will be conducted consistent 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.

#### 5.1.1 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 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 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 two to 16 ounce wide-mouth, plastic or glass jars, as provided by the lab. Sample jars will immediately be placed on ice in a cooler. The soil will be analyzed on a standard turnaround time.

The following are the container and holding requirements for solids.

**Table 5-1: Solid Samples – Container and Holding Requirements**

Analysis	Analytical Method(s)	Sample Volume	Containers	Preservation Requirements	Maximum Holding Time
VOCs	Method 5035	15 grams	(3) encore samplers	meOH, Cool to 4°C	48 hours to freeze, 14 days to analyze
SVOCs	Method 8270	8 oz.	8-ounce amber glass with Teflon-lined cap	Cool to 4°C (no preservative)	7 days to extract, 40 days to analyze
Metals	Method 6010/7000	8 oz.	8-ounce amber glass with Teflon-lined cap	Cool to 4°C (no preservative)	180 days (Hg 28 days; Cr 30 days)
Pesticides	Method 8081B	4 oz	4-ounce amber glass with Teflon-lined cap	Cool to 4°C (no preservative)	14 days to extract
Herbicides	Method 8151A	4 oz	4-ounce amber glass with Teflon-lined cap	Cool to 4°C (no preservative)	14 days to extract
PCBs	Method 8082	4 oz.	4-ounce amber glass with Teflon-lined cap	Cool to 4°C (no preservative)	14 days
PFAS	Method 1633	8 oz.	8-ounce plastic	Cool to 4°C (no preservative)	90 days

### 5.1.2 Groundwater Sampling

Groundwater sampling will be conducted consistent with NYSDEC and USEPA guidance for low-flow purging and sampling, as described in **Section 4.1.4**.

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 used, if any, will be based on the requirements of the analytical methods.

The following are the container and holding requirements for aqueous samples.

**Table 5-2: Aqueous Samples – Container and Holding Requirements**

Analysis	Analytical Method(s)	Sample Volume	Containers	Preservation Requirements	Maximum Holding Time
VOCs	Method 8260D	80 ml	(2) 40 ml VOA vials with HCL	HCL, pH < 2 Cool to 4°C	14 days
SVOCs	Method 8270E	500 ml	(2) 250 ml amber glass, Teflon lined	Cool to 4°C (no preservative)	7 days to extract
Pesticides	Method 8081B	500 ml	(2) 500 ml amber glass, Teflon lined	Cool to 4°C (no preservative)	7 days

<b>Analysis</b>	<b>Analytical Method(s)</b>	<b>Sample Volume</b>	<b>Containers</b>	<b>Preservation Requirements</b>	<b>Maximum Holding Time</b>
Herbicides	Method 8181A	1000 ml	(2) 1000 ml amber glass, Teflon lined	Cool to 4°C (no preservative)	7 days
PCBs	Method 8082	1 liter	1-Liter amber glass, Teflon lined	Cool to 4°C (no preservative)	14 days
Metals	Methods 200.7, 200.8, 6010D, 6020B, 7000A	500 ml	500 ml plastic with nitric acid	Nitric acid, pH < 2 Cool to 4°C	180 days
PFAS	Method 1633	250 ml	(2) 250 ml plastic	Cool to 4°C (no preservative)	28 days

## 5.2 Analytical Procedures

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

Soil, groundwater, SVI and wipe samples sent to a certified laboratory will be analyzed in accordance with EPA SW-846 methodology. A combination of the following contaminants will be analyzed:

- TCL VOCs (EPA Method 8260);
- TCL SVOCs (EPA Method 8270);
- TCL Pesticides (USEPA 8081);
- Herbicides (USEPA 8151);
- PCBs (USEPA 8082);
- TAL Metals (EPA Method 6010);
- Cyanide (EPA 9010C / 9012B)
- Hexavalent Chromium (EPA 7196A)
- 1,4-Dioxane (EPA Method 8270-SIM)
- PFAS (EPA Method 1633)
- SVI VOCs (EPA TO-15)

Category B deliverables will be requested to be used in a third-party data validation. A DUSR will be prepared by a third-party data consultant using the most recent methods and criteria from the USEPA. The DUSR will assess all sample analytical data, blanks, duplicates and laboratory control samples and evaluate the completeness of the data package. Waste characterization samples will not be validated.

## 5.3 Documentation

### 5.3.1 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.

### 5.3.2 Community Air Monitoring

Air monitoring will be conducted for on-site health and safety. Air monitoring will be conducted during active invasive activities periods, such as test boring advancement, test pitting, and well installation. The monitoring will include dust and VOC screening. Air sampling locations will be determined in the field and adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and downwind monitoring station. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

The specifics of the air monitoring procedures and criteria are detailed in the Community Air Monitoring Plan (CAMP) in **Appendix C** and Health and Safety Plan (HASP) in **Appendix D**. If particulate levels at the site exceed the thresholds listed in the CAMP or if visible airborne dust or nuisance odors / VOCs are observed on the site or leaving the site, then dust and / or odor / VOC suppression techniques listed below will be employed. The intent of the CAMP is not to preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around work areas. The remedial party will also take measures listed below to prevent dust production on the site. A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

Odors generated from RI activities, which are discernable offsite are not expected. The proposed intrusive work is minor and limited to soil borings and groundwater monitoring well installation. The maximum exposed area is approximately 4.5 inches in diameter for the monitoring well borehole. After extraction and initial screening, soil will be stored in Ziploc bags for further screening and then be placed in sampling glassware. Excess soil will be containerized. The boring will be backfilled. As such, soil causing odors will be quickly addressed and mitigated as part of routine handling procedures. If needed, odor neutralizing sleeves such as Atmos RusScent Sleeves or equivalent will be placed at the Site perimeter.

## 6.0 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 a PID and an aerosol particle meter. Details on air monitoring are provided in the CAMP. The CAMP is provided in **Appendix C**.

## 7.0 FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS

The NYSDEC Online EAF Mapper was utilized to determine if there are significant natural communities, endangered species, or threatened species on the Site. The land approximately one-quarter of a mile in each cardinal direction from the Site was searched. According to the EAF Mapper, there are no threatened or endangered species on the Site.

According to the NYSDEC Environmental Resource Mapper, there is a Freshwater Emergent Wetland in the northeastern portion of the Site. In December 2025, a wetland scientist determined the potential wetland shown on the Environmental Resource Mapper lacks the necessary criteria which defines a Federal or State wetland. The wetland determination is provided in **Appendix F**.

Based on the above, there are no ecological resources present on the Site and, consequently, no fish and wildlife resource impacts have been identified.

## 8.0 REPORTING

A daily field report will be prepared to document Work Plan activities and will be submitted to the Department Project Manager by the end of the following day. At a minimum, the report will include:

- A summary of work performed and progress made during the reporting day.
- The locations of Work Plan activities, identified on a site map where applicable.
- A summary of findings from the Community Air Monitoring Plan (CAMP), including any exceedances.
- Documentation of notable site conditions encountered during the work.
- Identification and explanation of any deviations from the approved Work Plan.

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

- Investigative methods;
- Observations and findings;
- Comparison of soil sample results to SCO's;
- Comparison of groundwater sample results to USEPA Technical and Operational Guidance Series (TOGS) values;
- Comparison of SVI sample results to NYSDOH air guideline values;
- Results of the community air monitoring program;
- Analytical results;
- A qualitative human exposure assessment;
- Map providing all public and private drinking water sources if emerging contaminant concentrations exceed TOGS values;
- Fate and transport analysis of contaminants; and
- Conceptual Site model.



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

## 9.0 SCHEDULE

It is assumed that NYSDEC will promptly review and provide comments on this RI Work Plan within 45 days of submission. Below is an anticipated schedule of milestones for the remediation of the Site.

### 9.1 Estimated Project Schedule

April 2026	Remedial Investigation Work Plan (RIWP) Submission
August 2026	RIWP Approved
September 2026	Remedial Investigation (RI) commenced
December 2026	RI Report Submission
March 2027	RI Report Approval
January 2027	Alternative Analysis Report (AAR) and Remedial Action Work Plan (RAWP) Submission
April 2027	AAR / RAWP Approval
June 2027	Decision Document

The schedule does not account for the possibility of Interim Remedial Measures (IRMs). If during the RI, impacts are identified that can readily be addressed by IRMs, the schedule will be updated accordingly.


## Figures

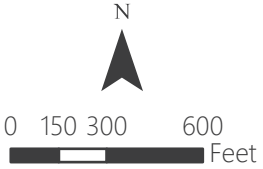
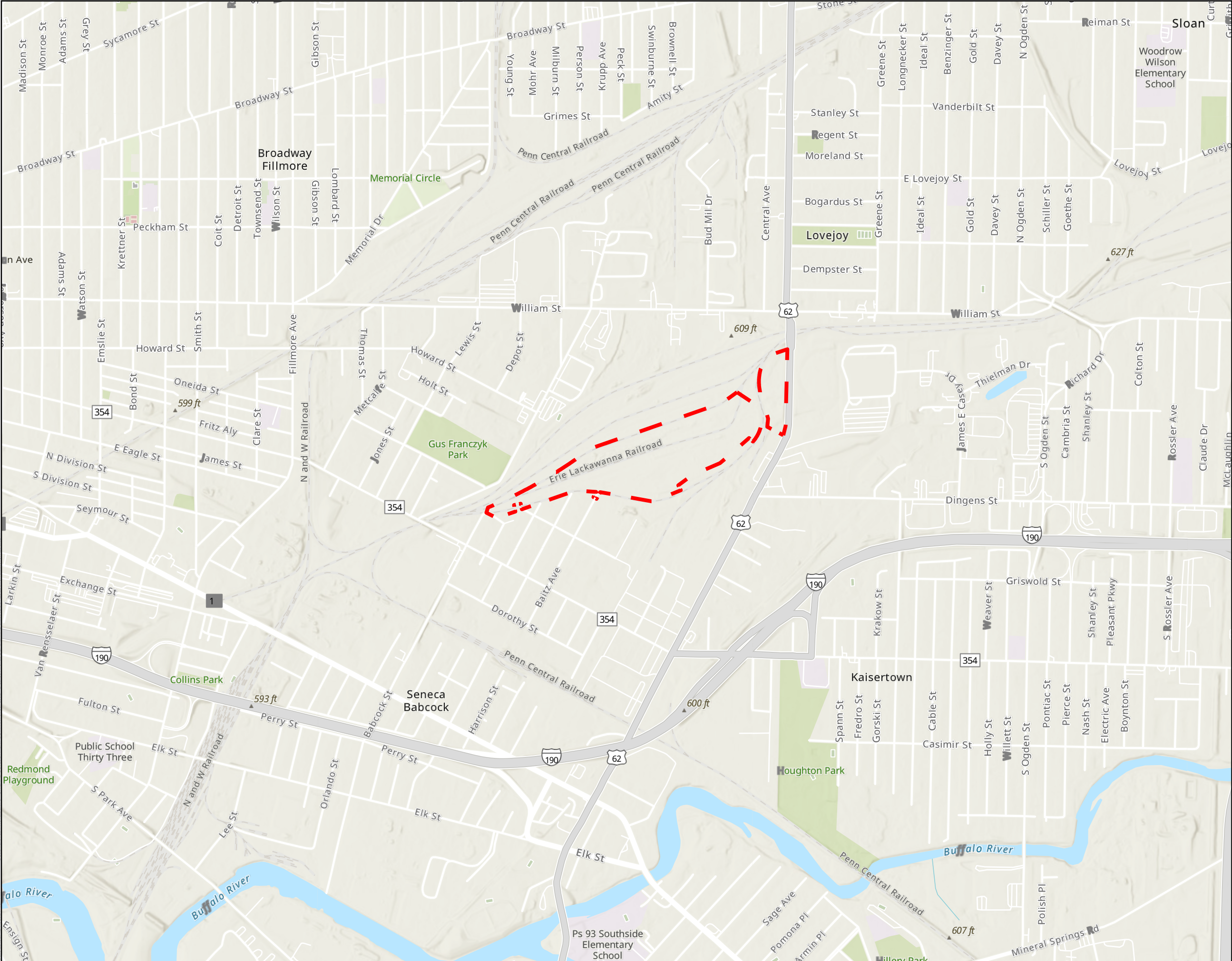
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Figure 1

Site Location

 Brownfield Cleanup Program (BCP) Boundary



When printed at 11 in. by 17 in.


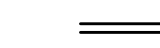
Former Erie Rail Yard Site  
Brownfield Cleanup Program

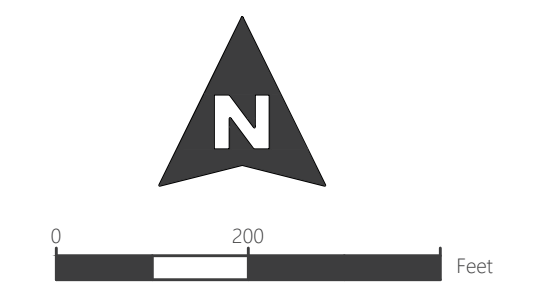
Sources: . Created by C&S Engineers, Inc.



Figure 2

Site Detail

-  Brownfield Cleanup Program (BCP) Boundary
-  Access Roads



1" = 200'

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Former Erie Rail Yard Site  
Brownfield Cleanup Program

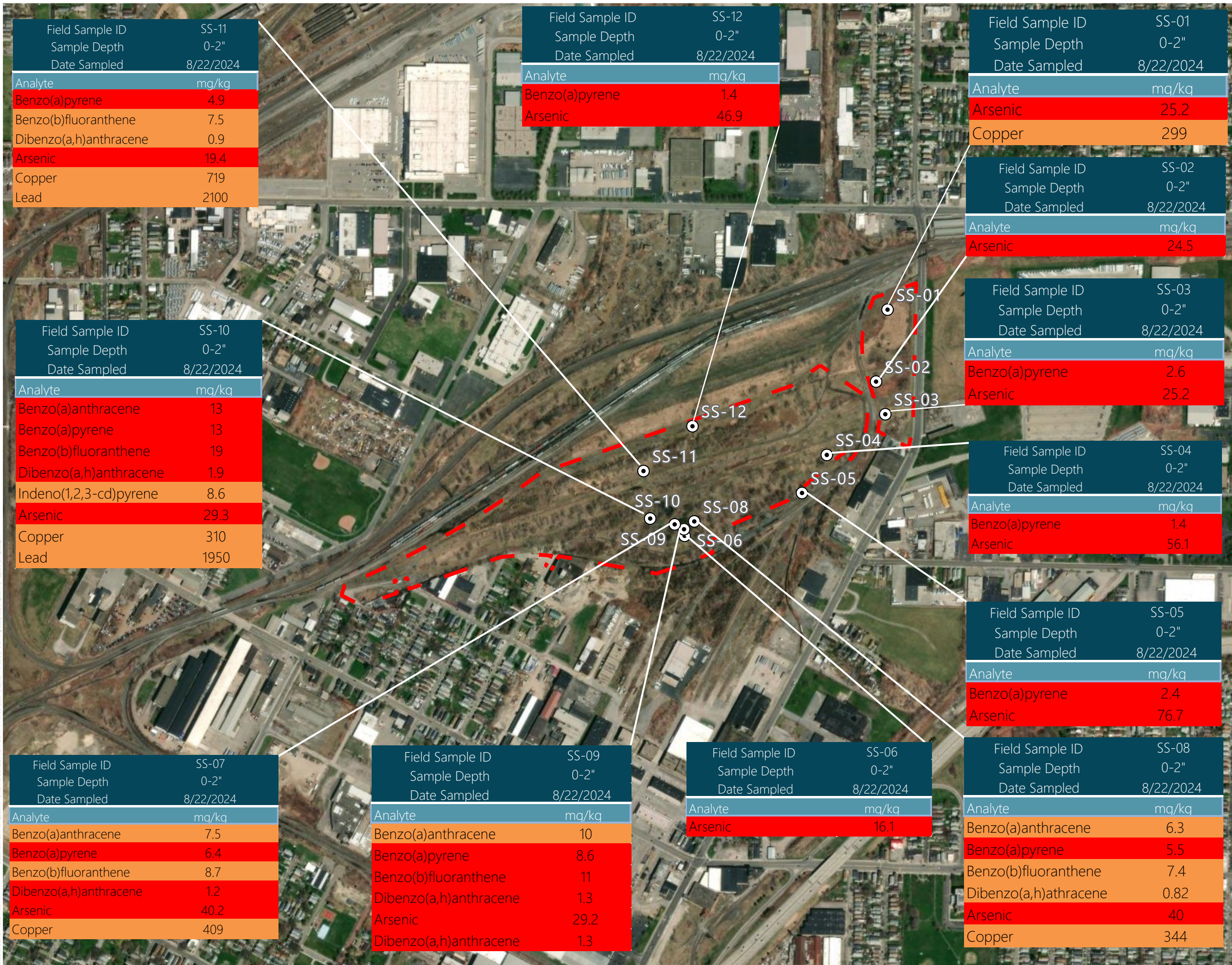
Sources:



**Figure 3A**  
**Environmental Concerns -**  
**Surface Soil Sample Results**

- ⊙ Surface Soil Location
- ▭ Brownfield Cleanup Program (BCP) Boundary

Field Sample ID	Sample Depth	Date Sampled
Commercial Use		
Industrial Use		



Field Sample ID	Sample Depth	Date Sampled
SS-11	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)pyrene	4.9	
Benzo(b)fluoranthene	7.5	
Dibenzo(a,h)anthracene	0.9	
Arsenic	19.4	
Copper	719	
Lead	2100	

Field Sample ID	Sample Depth	Date Sampled
SS-12	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)pyrene	1.4	
Arsenic	46.9	

Field Sample ID	Sample Depth	Date Sampled
SS-01	0-2"	8/22/2024
Analyte mg/kg		
Arsenic	25.2	
Copper	299	

Field Sample ID	Sample Depth	Date Sampled
SS-02	0-2"	8/22/2024
Analyte mg/kg		
Arsenic	24.5	

Field Sample ID	Sample Depth	Date Sampled
SS-03	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)pyrene	2.6	
Arsenic	25.2	

Field Sample ID	Sample Depth	Date Sampled
SS-04	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)pyrene	1.4	
Arsenic	56.1	

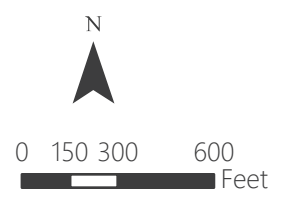
Field Sample ID	Sample Depth	Date Sampled
SS-05	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)pyrene	2.4	
Arsenic	76.7	

Field Sample ID	Sample Depth	Date Sampled
SS-08	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)anthracene	6.3	
Benzo(a)pyrene	5.5	
Benzo(b)fluoranthene	7.4	
Dibenzo(a,h)anthracene	0.82	
Arsenic	40	
Copper	344	

Field Sample ID	Sample Depth	Date Sampled
SS-10	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)anthracene	13	
Benzo(a)pyrene	13	
Benzo(b)fluoranthene	19	
Dibenzo(a,h)anthracene	1.9	
Indeno(1,2,3-cd)pyrene	8.6	
Arsenic	29.3	
Copper	310	
Lead	1950	

Field Sample ID	Sample Depth	Date Sampled
SS-09	0-2"	8/22/2024
Analyte mg/kg		
Benzo(a)anthracene	10	
Benzo(a)pyrene	8.6	
Benzo(b)fluoranthene	11	
Dibenzo(a,h)anthracene	1.3	
Arsenic	29.2	
Dibenzo(a,h)anthracene	1.3	

Field Sample ID	Sample Depth	Date Sampled
SS-06	0-2"	8/22/2024
Analyte mg/kg		
Arsenic	16.1	



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**Former Erie Rail Yard Site**  
**Brownfield Cleanup Program**

Sources: Created by C&S Engineers, Inc.

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**Figure 3B**  
**Environmental Concerns -**  
**Subsurface Soil Sample Results**

- ⊙ Soil Boring Location
- ▭ Brownfield Cleanup Program (BCP) Boundary

Field Sample ID	Sample Depth	Date Sampled
Analyte		mg/kg
Commercial Use		
Industrial Use		

Field Sample ID	BH-11	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Benzo(a)anthracene	180	
Benzo(a)pyrene	120	
Benzo(b)fluoranthene	170	
Chrysene	140	
Dibenzo(a,h)anthracene	24	
Indeno(1,2,3-cd)pyrene	62	
Arsenic	18.9	

Field Sample ID	BH-12	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Benzo(a)pyrene	1.6	
Arsenic	23.9	

Field Sample ID	BH-10	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Benzo(a)anthracene	17	
Benzo(a)pyrene	16	
Benzo(b)fluoranthene	25	
Dibenzo(a,h)anthracene	2.5	
Indeno(1,2,3-cd)pyrene	11	

Field Sample ID	BH-04	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Arsenic	83.8	

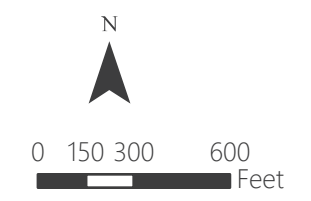
Field Sample ID	BH-05	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Arsenic	41.5	

Field Sample ID	BH-07	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Benzo(a)anthracene	6.4	
Benzo(a)pyrene	5.6	
Benzo(b)fluoranthene	8.1	
Dibenzo(a,h)anthracene	0.84	
Copper	3124	

Field Sample ID	BH-09	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Benzo(a)pyrene	2.9	
Arsenic	29.4	
Copper	325	

Field Sample ID	BH-06	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Benzo(a)pyrene	1.6	
Arsenic	44.2	
Copper	560	

Field Sample ID	BH-08	
Sample Depth	1'	
Date Sampled	8/22/2024	
Analyte		mg/kg
Arsenic	34.7	
Copper	339	



1:7,813  
 When printed at 11 in. by 17 in.

**Former Erie Rail Yard Site**  
**Brownfield Cleanup Program**

Sources: Created by C&S Engineers, Inc.

User Name: rdd/evm  
 Date: 10/14/2024 4:34 PM  
 Document Path: F:\Project\179 - UNLANO DEVELOPMENT COMPANY\179018002 - 2 Bailey Avenue BCP Planning - Sub\GIS\Projects\MapProject\MapProject.aprx



**Figure 4**

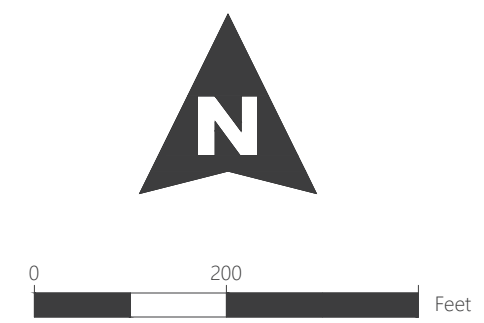
### Proposed RI Sampling Plan

Brownfield Cleanup Program (BCP) Boundary

Access Roads

#### RI Locations

- Existing Groundwater Monitoring Wells
- New Groundwater Monitoring Wells
- Test Pit Location/Sub-surface Soil Location
- Surface Soil Sample Location
- 2024 Surface Soil Sample Location



1" = 200'

When printed on 24 in. by 36 in.

## Former Erie Rail Yard Site Brownfield Cleanup Program

Sources:

cmartin 1/31/2025 1:03:52 PM F:\Project\19 - UNILAND DEVELOPMENT COMP\ANY\17078000 - 2 Bailey Avenue BCP\Design\CADD\Sheet Files\17078000\_Sample\_Plan.dwg

## Tables

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Table 1  
Proposed Remedial Investigation Sampling Program

Locations	Quantity
Surface	6
Test Pits	28
Existing Monitoring Well	3
New Monitoring Well	3

Matrix	Sample Type	Lab Analysis	No. Samples	Field Duplicates	Matrix Spike	Matrix Spike Duplicate	Trip Blank	Total
Soil	Surface	TCL VOC	6	1	1	1	--	9
		TCL SVOC	6	1	1	1	--	9
		TCL Pesticides	6	1	1	1	--	9
		Total PCB	6	1	1	1	--	9
		TAL Metals	6	1	1	1	--	9
		Cyanide	6	1	1	1	--	9
		Hexavalent Chromium	6	1	1	1	--	9
		Silvex	0	0	0	0	--	0
		PFAS	6	1	1	1	--	9
		1,4-Dioxane	6	1	1	1	--	9
	Fill Material	TCL VOC	28	1	1	1	--	31
		TCL SVOC	28	1	1	1	--	31
		TCL Pesticides	28	1	1	1	--	31
		Total PCB	28	1	1	1	--	31
		TAL Metals	28	1	1	1	--	31
		Cyanide	28	1	1	1	--	31
		Hexavalent Chromium	28	1	1	1	--	31
		Silvex	0	0	0	0	--	0
		PFAS	28	1	1	1	--	31
		1,4-Dioxane	28	1	1	1	--	31
	Native Soil	TCL VOC	5	0	0	0	--	5
		TCL SVOC	5	0	0	0	--	5
		TCL Pesticides	5	0	0	0	--	5
		Total PCB	5	0	0	0	--	5
		TAL Metals	5	0	0	0	--	5
		Cyanide	5	0	0	0	--	5
		Hexavalent Chromium	5	0	0	0	--	5
		Silvex	5	0	0	0	--	5
		PFAS	5	0	0	0	--	5
		1,4-Dioxane	5	0	0	0	--	5
	Waste Characterization	TCLP VOC	10	--	--	--	--	10
		TCLP SVOC	10	--	--	--	--	10
		PCB	10	--	--	--	--	10
TCLP Metal		10	--	--	--	--	10	
Reactivity		10	--	--	--	--	10	
Corrosivity		10	--	--	--	--	10	
Ignitability		10	--	--	--	--	10	
pH		10	--	--	--	--	10	
Percent Solids		10	--	--	--	--	10	
Water	Groundwater 2 Rounds	TCL VOC	12	2	2	2	2	20
		TCL SVOC	12	2	2	2	0	18
		TCL Pesticides	12	2	2	2	0	18
		Total PCB	12	2	2	2	0	18
		TAL Metals	12	2	2	2	0	18
		Cyanide	12	2	2	2	0	18
		Hexavalent Chromium	12	1	1	1	0	15
		Silvex	0	0	0	0	0	0
		1,4 Dioxane	12	2	2	2	0	18
		PFOA/PFOS	12	1	1	1	0	15

## **Appendices**

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## **Appendix A**

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### Environmental Reports

## **Appendix B**

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### Citizen Participation Plan



**Department of  
Environmental  
Conservation**

# **Brownfield Cleanup Program**

## **Citizen Participation Plan for Former Erie Rail Yard Site**

April 2026

**250 Baitz Avenue and 1000 Bailey Avenue  
City of Buffalo, Erie County, New York**

# Contents

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2. Citizen Participation Activities.....	3
3. Major Issues of Public Concern.....	8
4. Site Information.....	9
5. Investigation and Cleanup Process .....	10
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Appendix C - Site Location Map.....	18
Appendix D - Brownfield Cleanup Program Process.....	19

\* \* \* \* \*

**Note:** The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site’s investigation and cleanup process.

Applicant: **UDC-BCC North Buffalo, LLC (“Applicant”)**  
Site Name: **Former Erie Rail Yard Site (“Site”)**  
Site Address: **250 Baitz Avenue and 1000 Bailey Avenue**  
Site County: **Erie**  
Site Number: **C915416**

## 1. What is New York’s Brownfield Cleanup Program?

New York’s Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as “brownfields” so

that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: <http://www.dec.ny.gov/chemical/8450.html> .

## **2. Citizen Participation Activities**

### *Why NYSDEC Involves the Public and Why It Is Important*

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment
- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process
- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community
- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

### *Project Contacts*

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

### *Locations of Reports and Information*

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

### *Site Contact List*

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.

The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;

- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

**Note:** The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See <http://www.dec.ny.gov/chemical/61092.html> .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

### *CP Activities*

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.
- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

#### *Technical Assistance Grant*

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the significant threat determination for the site had not yet been made.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at <http://www.dec.ny.gov/regulations/2590.html>

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Activities	Timing of CP Activity(ies)
<p><b>Application Process:</b></p> <ul style="list-style-type: none"> <li>• Prepare site contact list</li> <li>• Establish document repository(ies)</li> </ul>	<p>At time of preparation of application to participate in the BCP.</p>
<ul style="list-style-type: none"> <li>• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period</li> <li>• Publish above ENB content in local newspaper</li> <li>• Mail above ENB content to site contact list</li> <li>• Conduct 30-day public comment period</li> </ul>	<p>When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.</p>
<p><b>After Execution of Brownfield Site Cleanup Agreement (BCA):</b></p> <ul style="list-style-type: none"> <li>• Prepare Citizen Participation (CP) Plan</li> </ul>	<p>Before start of Remedial Investigation</p> <p><b>Note:</b> Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.</p>
<p><b>Before NYSDEC Approves Remedial Investigation (RI) Work Plan:</b></p> <ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan</li> <li>• Conduct 30-day public comment period</li> </ul>	<p>Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.</p>
<p><b>After Applicant Completes Remedial Investigation:</b></p> <ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list that describes RI results</li> </ul>	<p>Before NYSDEC approves RI Report</p>
<p><b>Before NYSDEC Approves Remedial Work Plan (RWP):</b></p> <ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period</li> <li>• Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager)</li> <li>• Conduct 45-day public comment period</li> </ul>	<p>Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.</p>
<p><b>Before Applicant Starts Cleanup Action:</b></p> <ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list that describes upcoming cleanup action</li> </ul>	<p>Before the start of cleanup action.</p>
<p><b>After Applicant Completes Cleanup Action:</b></p> <ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report</li> <li>• Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)</li> </ul>	<p>At the time the cleanup action has been completed.</p> <p><b>Note:</b> The two fact sheets are combined when possible if there is not a delay in issuing the COC.</p>

### **3. Major Issues of Public Concern**

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

The Former Erie Rail Yard Site is located at 250 Baitz Avenue and 1000 Bailey Avenue in the City of Buffalo, Erie County, New York. The Site is comprised of two contiguous tax parcels (Tax Map ID Nos. 112.18-1-1.12, and 112.18-1-1.13) which are bounded by Bailey Avenue, Clinton Street, William Street, and New Babcock Street. The Site is approximately 60.322 acres and is owned by Norfolk Southern Railroad Company.

The Site is located in an urban portion of the City of Buffalo. The Site is currently vacant except for a small, dilapidated shed in the southeastern portion. Land uses immediately adjacent to the BCP Site include a mix of commercial, industrial, and residential uses.

Based on historical information and previous environmental investigations, the Site and surrounding properties were used for commercial and industrial purposes from at least 1894 through 1974. Historical uses included rail lines and rail car maintenance on-Site, with adjacent properties supporting manufacturing, fabrication, transportation, automotive repair, fueling stations, and tire-related operations. These activities, along with the placement and redistribution of historic fill material (HFM) during site redevelopment, are considered likely sources of contamination.

#### **Subsurface Soil**

Investigations indicate that subsurface soils are impacted primarily by semi-volatile organic compounds (SVOCs), including polycyclic aromatic hydrocarbons (PAHs), and metals. Impacts are generally encountered at shallow depths, beginning at approximately 1 foot below ground surface (bgs), and are more pronounced across the larger parcel.

SVOCs were detected at concentrations exceeding applicable Soil Cleanup Objectives (SCOs) for Residential, Restricted Residential, Commercial, and Industrial use. The most significant impacts were identified in borings BH-07 through BH-11, with BH-10 and BH-11 exhibiting the highest concentrations. Detected compounds include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene, among others, with exceedances ranging from marginal to several orders of magnitude above Industrial Use SCOs.

Metals are also widespread in subsurface soils, with arsenic, copper, and lead frequently exceeding Restricted Residential, Commercial, and Industrial SCOs. Elevated concentrations of these metals were identified across multiple borings, indicating broadly distributed impacts consistent with historic industrial activities and fill material.

## **Surface Soil**

Surface soils (0 to 2 inches bgs) exhibit similar contaminant profiles, with widespread impacts from SVOCs/PAHs and metals. SVOC concentrations exceed Restricted Residential, Commercial, and Industrial SCOs across multiple sample locations, with the highest concentrations generally observed in samples SS-07 through SS-10. The same suite of PAHs identified in subsurface soils is present at the surface, indicating consistent contamination throughout the soil column.

Metals, including arsenic, copper, lead, and cadmium, are also present at concentrations exceeding applicable SCOs in surface soils. Arsenic exceedances are widespread across the Site, while elevated lead and copper concentrations are more localized but reach levels significantly above regulatory thresholds.

Overall, contamination at the Site is characterized by widespread PAH and metal impacts in both surface and shallow subsurface soils. Concentrations frequently exceed applicable SCOs across multiple SCOs, with the highest impacts associated with areas of historic industrial activity and HFM placement. The distribution and magnitude of contamination indicate that impacts are both laterally extensive and present at shallow depths, representing a consistent site-wide condition.

The presence of the contamination is limiting the future use and re-investment opportunities on the Site.

Stakeholders in the remediation of the Site include the City of Buffalo, local residents, and users of adjacent buildings.

## **4. Site Information**

Appendix C contains a map identifying the location of the site.

### *Site Description*

The Site is located in the City of Buffalo on two parcels of land bounded by Bailey Avenue, Clinton Street, William Street, and New Babcock Street. The property that comprises the Site is approximately 60.322 acres and owned by Norfolk Southern Railroad Company. Land uses immediately adjacent to the Site include residential, commercial, and industrial uses.

### *History of Site Use, Investigation, and Cleanup*

According to historical records and past assessments, the Site and adjacent properties have been used for industrial purposes from at least 1894 until 1974. The Site was used as a series of rail lines and a rail car maintenance hub while adjacent property uses include manufacturing and fabrication facilities, shipping and transportation companies, auto repair centers, filling stations, and tire shops.

Contamination may be related to the placement of HFM throughout the years as property uses changed and buildings were built and / or demolished.

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.

## **5. Investigation and Cleanup Process**

### *Application*

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for commercial purposes.

To achieve this goal, the Applicant will conduct investigation activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

### *Investigation*

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

- 1) define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
- 2) identify the source(s) of the contamination;
- 3) assess the impact of the contamination on public health and the environment; and
- 4) provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

### *Interim Remedial Measures*

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

### *Remedy Selection*

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a “Certificate of Completion” (described below) to the Applicant.

**or**

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”. The Remedial Work Plan describes the Applicant’s proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

### *Cleanup Action*

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

### *Certificate of Completion*

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

### *Site Management*

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

# Appendix A

## Project Contacts and Locations of Reports and Information

### Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

#### **New York State Department of Environmental Conservation (NYSDEC):**

**Veronica Kreutzer**

Project Manager  
NYSDEC Region 9  
Division of Environmental Remediation  
700 Delaware Avenue  
Buffalo, NY 14209  
716.851.7220  
[veronica.kreutzer@dec.ny.gov](mailto:veronica.kreutzer@dec.ny.gov)

**Sarah Whiteway**

Citizen Participation Specialist  
NYSDEC 9  
700 Delaware Avenue  
Buffalo, NY 14209  
716.851.7220  
[sarah.whiteway@dec.ny.gov](mailto:sarah.whiteway@dec.ny.gov)

#### **New York State Department of Health (NYSDOH):**

**{insert name of project manager}**

Project Manager

NYSDOH

**{insert central or regional office address}**

**{insert a contact telephone number}**

## Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

**Central Library  
1 Lafayette Square  
Buffalo, NY 14203**

Attn: Carol Batt  
Phone: 716.858.7180

Hours:

Sunday 12:00 PM - 05:00 PM  
Monday 08:00 AM - 07:00 PM  
Tuesday 08:00 AM - 07:00 PM  
Wednesday 08:00 AM - 07:00 PM

Thursday 08:00 AM - 07:00 PM  
Friday 09:00 AM - 05:00 PM  
Saturday 09:00 AM - 05:00 PM

**NYSDEC Region 9**

700 Delaware Avenue  
Buffalo, NY 14209  
716.851.7220

Attn: Veronica KreutzerPhone:  
716.851.7220

Hours: (call for appointment)

# Appendix B

## Site Contact List

Local Government – City of Buffalo

Sean Ryan  
65 Niagara Square  
Room 201  
Buffalo, NY 14202

James Morrell  
City of Buffalo Planning Board Chair  
901 City Hall, 65 Niagara Square  
Buffalo, NY 14202

Mark Poloncarz  
Erie County Executive  
95 Franklin Street  
Buffalo, NY 14202

Daniel Castle  
Erie County Commissioner of Environment and Planning

95 Franklin Street, 10th Floor  
Buffalo, NY 14202

Residents, Owners and Occupants of Property and Property Adjacent to Site:

Property Address: 959 Bailey Avenue  
Niagara Mohawk Power Corp.  
144 Kensington Avenue  
Buffalo, NY 14214

Property Address: 935 Bailey Avenue  
Newbany Corporation  
55 Glenlake Parkway NE  
Atlanta, GA 30328

Property Address: 95 Rapin Place  
Consolidated Rail Corporation  
2001 Market Street  
Philadelphia, PA 19101-1419

Property Address: 501 Babcock Street  
Raymond & Alice Seger  
501 Babcock Street  
Buffalo, NY 14206

Property Address: 141 Bushnell Street  
Raymond Publication Inc.  
4626 Mount Veronon Boulevard  
Hamburg, NY 14075

Property Address: 30 Manitoba Street  
Robert E. Gartler  
70 Niagara Street  
Buffalo, NY 14202

Property Address: 34 Manitoba Street  
AIM Corrugated Container  
34 Manitoba Street  
Buffalo, NY 14206

Property Address: 221 Scoville Avenue  
Vaughn Desiree  
221 Scoville Avenue  
Buffalo, NY 14206

Property Address: 224 Baitz Avenue, 205 Baitz Avenue  
PFC Acquisition Corp.

205 Baitz Avenue  
Buffalo, NY 14206

Property Address: 932 Bailey Avenue  
Memsmer Refrigeration, Inc.  
903 Bailey Avenue  
Buffalo, NY 14206

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Local Media:

Local Newspaper:

The Buffalo News  
726 Exchange Street  
Buffalo, NY 14210  
1 (800) 777 - 8640  
subscriberservices@buffalonews.com

Local Television:

WGRZ – TV Channel 2  
259 Delaware Ave  
Buffalo, NY 14202  
(716) 849-2200  
<http://www.wgrz.com/news/default.aspx>

WIVB – TV Channel 4  
2077 Elmwood Ave  
Buffalo, NY 14207  
(716) 874-4410  
<http://www.wivb.com/subindex/news>

WKBW – TV Channel 7  
7 Broadcast Plaza  
Buffalo, NY 14202  
(716) 840-7777  
<http://www.wkbw.com/>

Radio:

WBEN 930 AM Radio  
500 Corporate Pkwy  
Amherst, NY 14226  
(716) 843-0600  
<http://www.wben.com>

WHLD 1270 AM Radio

50 James E. Casey Dr  
Buffalo, NY 14206  
(716) 888-9735  
<http://www.talk1270.com>

WEBR 1440 AM Radio  
1580 Kenmore Ave  
Buffalo, NY 14216  
(716) 267-1440  
<http://www.webrradio.com>

WBFO 88.7 FM Radio  
3435 Main Str  
Buffalo, NY 14214  
(716) 829-6000  
<http://www.wbfo.org/>

Local Water Supplier:

Buffalo Water Department  
281 Exchange Street  
Buffalo, New York 14202

Persons Requesting to be Placed on Contact List:

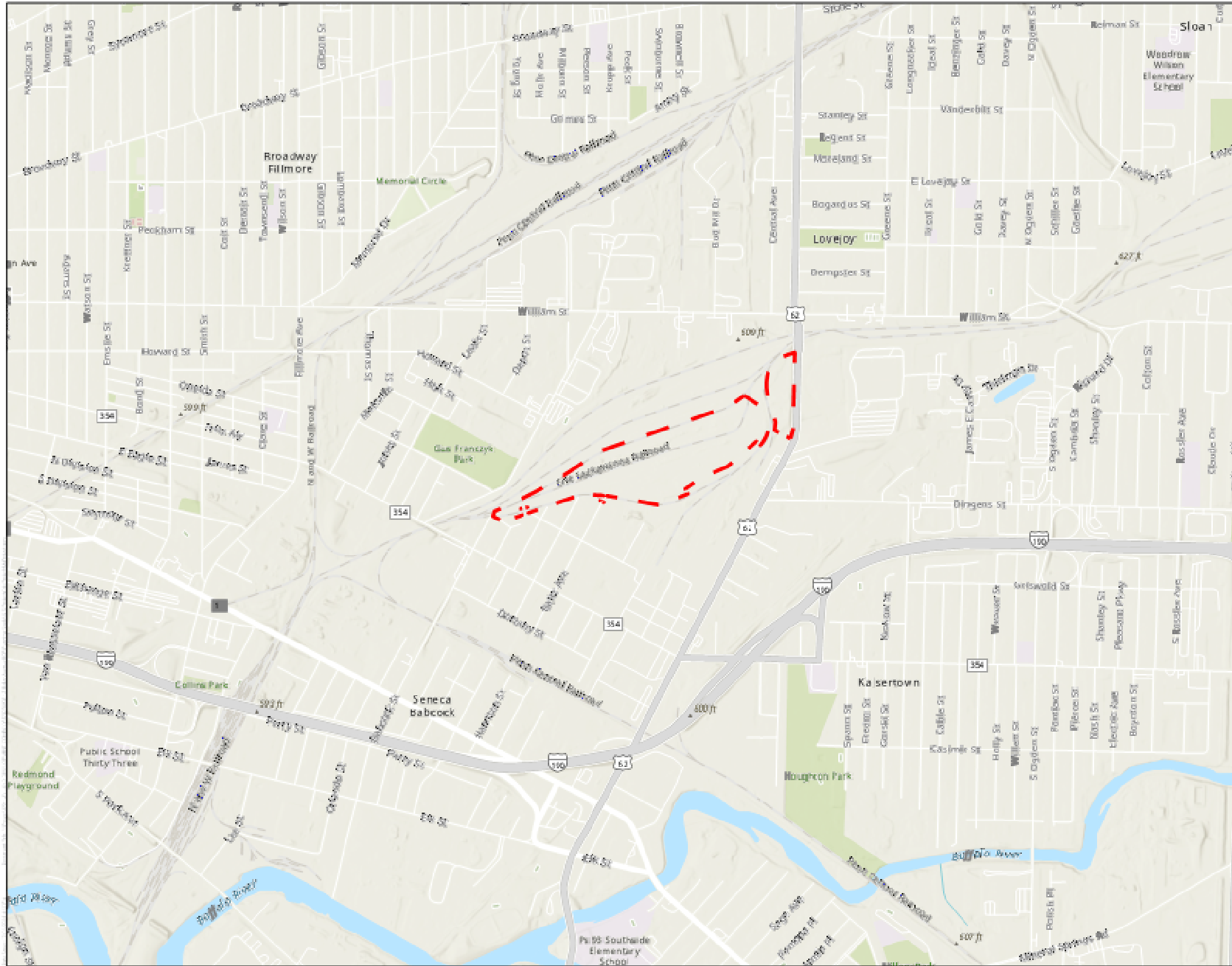
To Be Completed as Necessary

School and Day Care Facilities:

Children's Center for Success at the Family Help Center  
60 Dingens Street  
Buffalo, NY 14206  
(716) 822-0919

# Appendix C

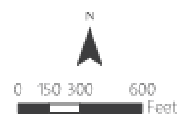
## Site Location Map



**Figure 1**

Site Location

 Brownfield Cleanup Program (BCP) Boundary

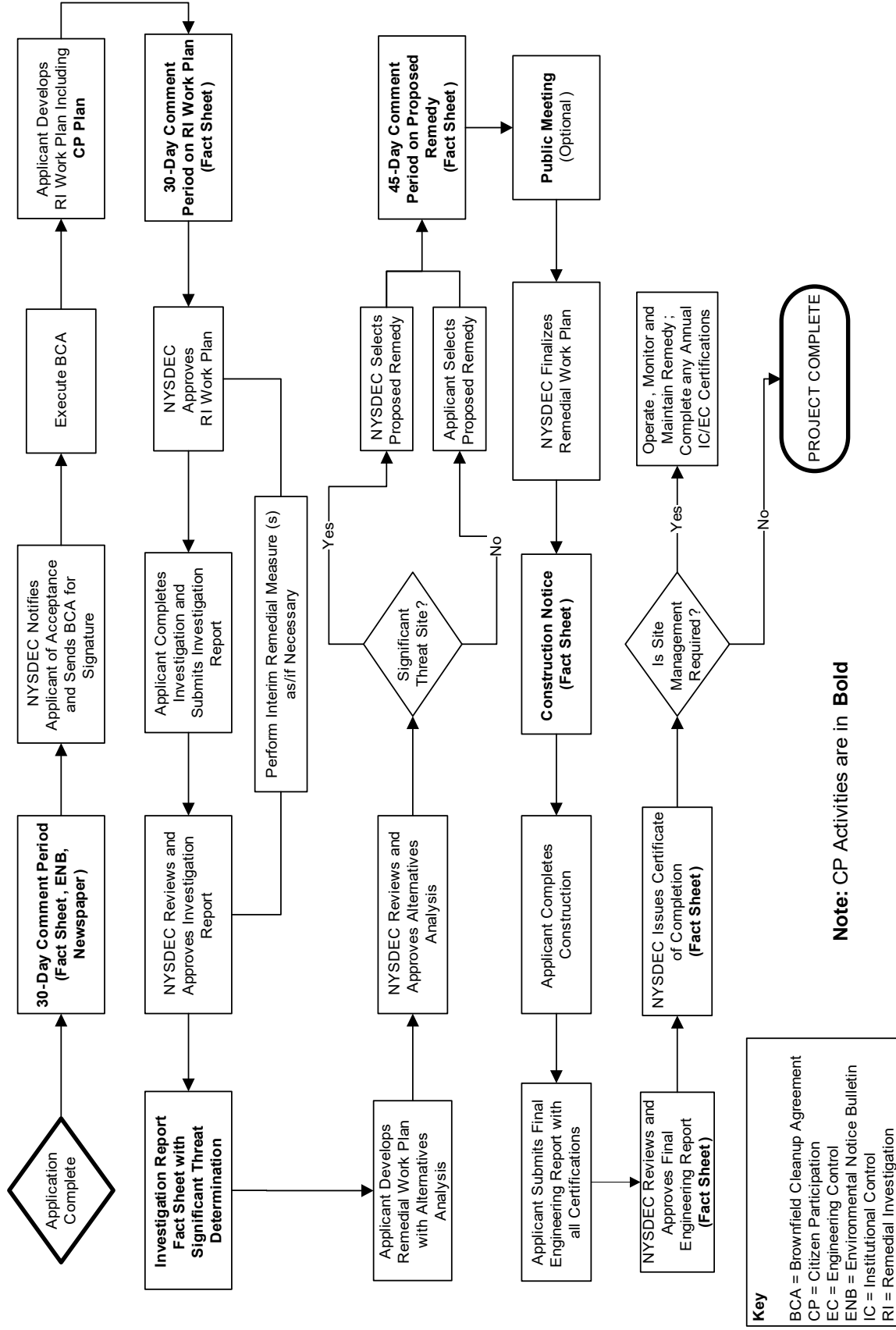


When printed at 11 in. by 17 in.

**2 Bailey Avenue Site**  
Brownfield Cleanup Program

Source: Created by C&S Engineers, Inc.

# Appendix D– Brownfield Cleanup Program Process



## **Appendix C**

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### Community Air Monitoring Plan

**Community Air Monitoring Plan**

**for**

**Former Erie Rail Yard Site  
250 Baitz Avenue and 1000 Bailey Avenue  
City of Buffalo, Erie County, New York  
BCP Site No. C915416**

**April 2026**

## Community Air Monitoring Plan

### Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary.

**Continuous monitoring** will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

**Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

### VOC Monitoring, Response Levels and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate, such as isobutylene. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

#### Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time

monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m<sup>3</sup>) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m<sup>3</sup> above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m<sup>3</sup> above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m<sup>3</sup> of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

### **Fugitive Dust and Particulate Monitoring**

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the

excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

- (a) Objects to be measured: Dust, mists or aerosols;
- (b) Measurement Ranges: 0.001 to 400 mg/m<sup>3</sup> (1 to 400,000 :ug/m<sup>3</sup>);
- (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m<sup>3</sup> for one second averaging; and +/- 1.5 g/m<sup>3</sup> for sixty second averaging;
- (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
- (e) Resolution: 0.1% of reading or 1g/m<sup>3</sup>, whichever is larger;
- (f) Particle Size Range of Maximum Response: 0.1-10;
- (g) Total Number of Data Points in Memory: 10,000;
- (h) Logged Data: Each data point with average concentration, time/date and data point number;
- (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
- (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
- (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
- (l) Operating Temperature: -10 to 50° C (14 to 122° F); and
- (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record-keeping plan.

5. The action level will be established at 150 ug/m<sup>3</sup> (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in

excess of 150 ug/m<sup>3</sup>, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m<sup>3</sup> above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m<sup>3</sup> continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM-10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m<sup>3</sup> action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

## **Appendix D**

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### Health and Safety Plan



**C&S Engineers, Inc.**  
141 Elm Street  
Buffalo, New York 14203

# Health and Safety Plan

**Buffalo Central Terminal  
495 Paderewski Drive, Buffalo, New York  
BCP Site No. C915414**

**Prepared for:**  
Central Terminal Restoration Corporation  
P.O. Box 51  
Buffalo, New York 14212

March 2026

C&S Project No. AS3.001.002



# Health and Safety Plan

**Buffalo Central Terminal**  
**495 Paderewski Drive**  
**BCP Site No. C915414**

**Prepared for:**  
Central Terminal Restoration Corporation  
P.O. Box 51  
Buffalo, New York 14212

**Prepared by:**  
C & S Engineers, Inc.  
141 Elm Street  
Buffalo, New York 14203

March 2026

C&S Project#: AS3.001.002

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## EMERGENCY PHONE NUMBERS

Emergency Service.....	911
<u>Police</u> : Buffalo Police Department.....	(716) 851-4444
<u>Fire</u> : Buffalo Fire Department.....	(716) 851-5333
<u>Hospital</u> : Buffalo General Hospital: Emergency Room.....	(716) 859-5600
<u>Hospital</u> : Mercy Hospital of Buffalo: Emergency Room.....	(716) 826-7000
Department of Public Works.....	(716) 851-5636
National Response Center.....	(800) 424-8802
Poison Control Center.....	(800) 222-1222
Center for Disease Control.....	(800) 311-3435
NYSDEC Region 9 (Buffalo, New York).....	(716) 851-7000
C&S Engineers.....	(315) 455-2000
Monica Pellegrino Faix.....	(716) 754-6142

### 1.0 GENERAL INFORMATION

This Health and Safety Plan (HASP) addresses health and safety considerations for the activities that personnel employed by C&S Engineers, Inc., may be engaged in during site investigation and remedial activities at the Buffalo Central Terminal Site located at 495 Paderewski Drive, City of Buffalo, Erie County, New York; hereby, referred to as (Site). This HASP will be implemented by the Health and Safety Officer (HSO) during site work. All personnel engaged in the Remedial Investigation are required to maintain current HAZWOPER training, including initial 40-hour training, on-the-job training, and consistent annual 8-hour refresher training, as per the requirements of 29 CFR 1910.120.

Compliance with this HASP is required of C&S personnel who enter this Site. The content of the HASP may change or undergo revision based upon additional information made available to the health, safety, and training (H&S) committee, monitoring results or changes in the technical scope of work. Any changes proposed must be reviewed by the H&S committee.

## 1.1 Responsibilities

Project Manager .....	Cody Martin Phone: (716) 955-3021 Cell: (716) 864-3752
C&S Health and Safety Director .....	Mike Sherlock Phone: (315) 703-4210 Cell: (315) 420-3455
Site Health and Safety Officer .....	H. Nevin Bradford, III, P.E. Phone: (315) 703-4284 Cell: (315) 529-0482
Emergency Coordinator.....	Cody Martin Phone: (716) 955-3021 Cell: (716) 864-3752

## 1.2 Applicable Standards and Regulations References

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where a conflict or overlap among regulations and/or these specifications exist, the most stringent requirements shall apply. C&S's Project Manager will determine which requirements are most stringent.

- **AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)**
  - ANSI Z89.1, Personnel Protective Equipment-Protective Headwear for Industrial Workers-Requirements (Latest Revision)
  - ANSI Z87.1, Occupational and Educational Personal Eye and Face Protection Devices
  - ANSI Z9.2, Fundamentals Governing the Design and Operation of Local Exhaust Systems
  - ANSI Z88.2-80, Practices for Respiratory Protection
- **CODE OF FEDERAL REGULATIONS (CFR)**
  - 29 CFR Subpart D Walking-Working Surfaces
  - 29 CFR 1910 Occupational Safety and Health Standards-All Sections
  - 29 CFR 1926 Safety and Health Regulations for Construction-All Sections
  - 40 CFR 50.6 National Primary and Secondary Ambient Air Quality Standards for Particulate Matter
  - 40 CFR 61 National Emissions Standards for Hazardous Air Pollutants (NESHAPS)-Subpart A-General Provisions
  - 49 CFR 172 Hazardous Material Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

- **NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)**
  - Publication Number 87-108 Respiratory Decision Logic
  - NIOSH/OSHA Booklet 3142 Lead in Construction
  - Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH Publication 85-115)
  
- **U.S. DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)**
  - PUB 3126 Working with Lead in the Construction Industry
  - 29 CFR 1910, Subpart I, Appendix B-Non-Mandatory Compliance Guidelines for Hazard Assessment and Personal Protective Equipment Selection

## 2.0 HEALTH AND SAFETY PERSONNEL

The following information briefly describes the health and safety designations and general responsibilities for this Site.

### 2.1 Project Manager (PM)

The PM is responsible for the overall project including the implementation of the HASP. Specifically, this includes allocating adequate manpower, equipment, and time resources to conduct Site activities safely.

### 2.2 Health and Safety Manager

- Has the overall responsibility for coordinating and reporting health and safety activities and the health and safety of Site Workers.
- Must have completed, at a minimum, the OSHA 30-Hour Construction Safety Training, and either the 24-Hour training course for the Occasional Hazardous Waste Site Worker or the 40-Hour training course for the Hazardous Waste Operations Worker that meets OSHA 29 CFR 1910.
- Must have completed the 8-Hour Site supervisor/manager's course for supervisors and managers having responsibilities for hazardous waste Site operations and management.
- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment (PPE).
- Conducts initial on-site specific training prior to Site Workers commencing work.
- Conducts and documents daily and periodic safety briefings.
- Ensures that field team members comply with this HASP.
- Immediately notifies the Project Manager of all accident / incidents.
- Determines upgrading or downgrading of PPE based on Site conditions and/or real time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as the manufacturer's instructions determine.
- Provides daily summaries of field operations and progress to the Project Manager.

- Submits and maintains all documentation required in this HASP and any other pertinent health and safety documentation.

### **2.3 Health and Safety Officer (HSO)**

- Must be designated by the Health and Safety Manager and at a minimum, have the OSHA 10-Hour Construction Safety Training.
- Must schedule and attend a Pre-Construction Safety Meeting with the Health and Safety Manager to discuss the Subcontractor Safety Requirements and must attend the Weekly Subcontractor Coordination Meeting.
- Responsible for ensuring subcontractors and their lower tier contractors comply with project safety requirements.
- Must make frequent and regular inspections of their work areas and activities and ensure hazards that are under their control are corrected immediately and all other hazards are reported to the Project Manager and Health and Safety Manager.
- Must report all work-related injuries, regardless of severity, to the Project Manager and the Health and Safety Manager within 24 hours after they occur.

### **2.4 Emergency Coordinator**

- The Emergency Coordinator or his on-site designee will, in coordination with the Authority / Agency having Jurisdiction, implement the emergency response procedures outlined in Section 12 whenever conditions at the Site warrant such action.
- The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency transport of C&S personnel as necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

### **2.5 Site Workers**

- Report any unsafe or potentially hazardous conditions to the HSO and the Health and Safety Manager.
- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.
- Comply with rules, regulations, and procedures as set forth in this HASP, including any revisions that are instituted.



- Prevent unauthorized personnel from entering work Site.

### 3.0 SITE HAZARDS EVALUATION

#### 3.1 Chemical Hazards

##### 3.1.1 Nature of Chemical Hazards

Knowledge of the nature and extent of contamination in the site soils is limited to the following:

Media	Contaminant Class	Identified Compounds
Soil	VOCs	
	SVOCs	Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene
	Pesticides	
	Herbicides	
	PCBs	
	Metals	Lead, Barium, Manganese
	PFAS	

##### 3.1.2 Common Routes of Exposure

The contaminants at the Site may enter the human body in a variety of ways. Based on the nature of site contaminants, the chemical routes of exposure anticipated from the remedial activities at this site include:

**Table 3-1: Routes of Exposure**

Route	Mechanism	Control
Absorption	Dermal (skin) contact with impacted soil on-site resulting in absorption of chemicals of concern through the skin and into the blood stream.	Proper use of PPE will minimize risks of exposure at the site.
Ingestion	Chemicals / materials of concern can come in direct contact with the mouth from soil or other contaminated areas (PPE, skin, tools, etc.) and enter the bloodstream through the stomach lining.	Proper care in handling PPE and tools, refraining from eating and drinking at the Site, and frequent hand washing with soap and water will minimize risks of exposure.
Inhalation	Volatile vapors and/or contaminants attached to dust and particulates can be entrained by wind and become airborne across the site and be subsequently inhaled through the nose and / or mouth. This exposure route is the most likely way for worker exposure to occur.	Conduct monitoring of air quality for VOCs in worker breathing zones. Employ methods that minimize the creation of dust and utilize dust suppression techniques to minimize dust and particulates. Respirators with appropriate filtration and organic adsorption cartridges should be



Route	Mechanism	Control
		available to on-site workers in case volatile compounds become a nuisance or health hazard.

### 3.2 Physical Hazards

Based upon the anticipated field activities, the following potential physical hazardous conditions may exist:

**Table 3-2: Physical Hazards**

Category	Mechanism	Control
Mechanical Equipment	The use of typical mechanical equipment such as drill rigs and sampling vehicles can create a potential for crushing and pinching hazards due to movement and positioning of the equipment, movement of lever arms and hydraulics, and entanglement of clothing and appendages in exposed drives and tracks. Mechanical equipment can also create a potential for impact of steel tools, masts, and cables should equipment rigging fail, or other structural failures occur during hydraulic equipment operation.	Heavy equipment work must be conducted only by trained, experienced personnel. If possible, personnel must remain outside the turning radius of large, moving equipment. At a minimum, personnel must maintain visual contact with the equipment operator. When not operational, equipment must be set and locked so that it cannot be activated, released, dropped, etc. The mechanical equipment stated above represents typical equipment that is ordinarily used during this scope of work, but is not meant to be an all-inclusive list. Similar precautions should be used around other mechanical equipment deployed to the Site that is not listed above.
Excavations and Trenches	The use of excavation/trenching such as removal of overburden soils, installation of utilities, and site grading operations can cause potential for suffocation, crushing, or other injury from falling material. Advancement of excavation and trenches can also create possible damage/failure of any installed underground utility services and create hazards. Other hazards created can include tripping, slipping, or falling. Entering an excavation or trench could have the possibility of an explosive, flammable, toxic, or oxygen-deficient atmosphere within the excavation or trench.	Ensure compliance with OSHA's construction standard for excavations (29 CFR 1926 Subpart P). Designate a Competent Person responsible for selecting and implementing the appropriate protective system(s), assuring appropriate means of access and egress for excavations greater than four (4) feet in depth, and for ensuring that potential atmospheric and physical hazards associated with any excavation / trenching activities are completed in accordance with Subpart P and other applicable OSHA Standards.
Noise	Work around large equipment often creates excessive noise. Noise can cause workers to be startled, annoyed, and/or distracted; as well as causing pain, physical damage to the ear, and temporary and/or permanent hearing loss; and can interfere with communication.	If workers are subjected to noise exceeding an 8-hour time-weighted average sound level of 85 dBA, hearing protection will be required with an appropriate noise reduction rating to comply with 29 CFR 1910.95 and to reduce noise levels below levels of concern.

Category	Mechanism	Control
Slips/Trips/Falls	Personnel may encounter slip, trip, and fall hazards associated with excavations, manways, and construction debris and materials. Precautionary measures should be taken by identifying and removing slip, trip, and fall hazards prior to commencing work.	In the event slip, trip, and fall hazards cannot be removed or minimized, site workers will be shown the location of the physical hazard and be asked to avoid it during work activities.
Fire/Explosion	The potential for fire and/or explosion emergencies is always present on the Site.	Field vehicles will be equipped with a fire extinguisher. Employees, contractors and workers must be trained in the proper use of fire suppression equipment. However, large fires that cannot be controlled with a fire extinguisher shall be handled by professionals. The proper authorities shall be notified in these instances, as well as the HSO and Health and Safety Manager.
Cold Exposure	<p>Persons working in the outdoors in temperatures at or below freezing may be subject to frostbite. Extreme cold for a short time may cause injury to exposed body surfaces or result in a profound generalized cooling which can cause death. Areas of the body such as fingers, toes, and ears, are the most susceptible to cold stress. Ambient air temperature and wind velocity are two factors which influence the development of a cold weather injury. Local injury resulting from exposure to cold temperatures is known as "frostbite." There are several degrees of damage in which frostbite of the extremities can be categorized, as follows:</p> <ul style="list-style-type: none"> <li>• Frost nip or incipient frostbite is characterized by sudden bleaching or whitening of the skin.</li> <li>• Superficial frostbite occurs when the skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.</li> <li>• Deep frostbite is characterized by tissues that are cold, pale, and solid; this is an extremely serious injury.</li> </ul>	<p>Wear several layers of dry clothes so that you can vary the amount of clothing to match the conditions. If there is wind, wear a windbreaker, since wind increases the effects of cold air and in turn lowers your body's core temperature even faster. Don't get overheated. Sweat can dampen clothing and in turn lead to over-cooling. Keep hands, feet, ears, and face warm. These are the areas of the body where frostbite tends to strike first. Heart disease and the use of sedatives or excessive alcohol will make you more susceptible to cold stress. If you feel chilly or sleepy, or have pain in your extremities, go to a warm shelter to recover.</p>

Category	Mechanism	Control
Heat Exposure/Stress	<p>Heat stress can result from a number of contributing factors, including environmental conditions, clothing, and workload as well as the physical condition of the individual. Since heat stress is one of the most common injuries / symptoms associated with outdoor work conducted with direct solar load, and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Signs and symptoms of heat-related illnesses which all on-site personnel should be aware, include the following:</p> <ul style="list-style-type: none"> <li>• Heat rash may result from continuous exposure to heat or humid air.</li> <li>• Heat cramps are caused by heavy sweating and may include muscle spasms and pain in the hands, feet, and abdomen.</li> <li>• Heat exhaustion is indicated by pale, cool, and moist skin; heavy sweating; dizziness; nausea; and fainting.</li> <li>• Heat stroke is indicated by red, hot, and unusually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; rapid pulse; and coma. Immediate action must be taken to cool the body before serious injury or death occurs.</li> </ul>	<p>The following will steps will be taken to limit heat exposure: adjust schedules, take breaks, limit heavy work in protective clothing or in a hot environment may require more time resting than working. Schedule heavy work in the coolest part of the day. Have shaded rest shelters with chairs or benches. Drink Fluids. Sweating cools the body, but it also robs the body of fluid. Drink enough fluids to replace what you lose. You may not feel thirsty until you've become dehydrated. Drink regularly throughout the day. Don't wait until you're thirsty.</p> <p>Monitor for signs of potential heat exposure and stress through use of the "buddy system", with frequent communication between site personnel. Take scheduled breaks and hydrate frequently throughout the day. Maintain an adequate supply of cold water and electrolyte containing drinks in support zone of site.</p> <p>In the event that personnel are observed to exhibit dizziness, disorientation, heat rash, slurred speech, dry mouth, heat cramps, or other symptoms of heat stress, discontinue work immediately and move affected person(s) to a location that is free from direct sunlight and provide fluids (preferably "Gatorade" or similar product that will replenish electrolytes). Monitor condition during to evaluate whether there is notable improvement in their condition.</p>
Utilities	<p>Overhead and underground utilities may exist within the Work Area, which may expose workers to electrocution hazards, explosive hazards, and volatile vapors.</p>	<p>Dig Safely New York shall be contacted a minimum of three business days prior to initiating the field activities, to arrange for the identification and markout of buried utilities at the site. The contact number for Dig Safely New York is 1-800-962-7962.</p> <p>In the event of inadvertent damage to buried utilities, all work shall cease, and the situation shall be evaluated by the HSO.</p>

### 3.3 Environmental Hazards

Based upon the anticipated field activities, the following potential environmental hazardous conditions may exist:

**Table 3-3: Environmental Hazards**

Category	Hazard	Control
Biological	Ticks, bees/wasps, mosquitos, spiders, snakes, rabid animals	<p>There are no known species of poisonous spiders or snakes common to the area.</p> <p>Minimize potential exposure to by wearing wear long pants and safety shoes. Change clothing and carefully examine for evidence of insects and ticks upon undressing, immediately following return from the site.</p> <p>Avoid contact with any animals, either wild or domestic, that may be encountered while conducting the field activities, and notify the local office of the New York State Department of Health (NYSDOH) in the event that animals are observed to elicit strange behavior. In the event of contact with an animal that is behaving in a strange manner, the NYSDOH should be contacted immediately.</p>
Biological	Poison Ivy, Poison Oak	<p>Familiarize yourself with the characteristics and appearance of poison ivy and poison oak. Be cognizant of vegetation while conducting work activities.</p> <p>Minimize potential exposure to by wearing wear long pants and safety shoes. Change clothing immediately following return from the site.</p>
Weather	Wet surfaces, lighting, high winds (falling objects, contaminated dust), hail, excessive heat, extreme cold, snow and ice.	<p>Remain cognizant of weather conditions, forecasts, and changing weather conditions. Exercise extra caution during wet and inclement site conditions to minimize risk of slips and falls. Avoid work during periods of high winds to reduce risk of injury from falling objects and airborne contaminant migration. Cease work and monitor conditions in the event that lightning is observed or suspected in the area, or in the event that other weather conditions pose a health or safety hazard.</p>

## **4.0 TRAINING**

### **4.1 Site-Specific Training**

Training will be provided that specifically addresses the activities, procedures, monitoring, and equipment for the Site operations prior to going on Site. Training will include familiarization with Site and facility layout, known and potential hazards, and emergency services at the Site, and details all provisions contained within this HASP. This training will also allow Site Workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

### **4.2 Task-Specific Training**

For projects involving asbestos sampling, personnel will be trained to collect bulk asbestos samples using the requirements set forth in 40 CFR Part 763.92(a) (1) and (2) and 40 CFR Part. 763, Subpart. E, App. C. The training incorporates many sections of 40 CFR Part 763, but should focus on the sampling method listed in 40 CFR Part 763.86. The training includes inspection planning, bulk sampling, personal protection, and reporting. Personnel must demonstrate proficiency by identifying areas where asbestos may be found and properly collecting a bulk sample using proper methodology.

### **4.3 Safety Briefings**

C&S project personnel will be given briefings by the HSO on a daily or as needed basis to further assist Site workers in conducting their activities safely. Pertinent information will be provided when new operations are to be conducted. Changes in work practices must be implemented due to new information made available, or if Site or environmental conditions change. Briefings will also be given to facilitate conformance with prescribed safety practices. When conformance with these practices is not occurring or if deficiencies are identified during safety audits, the project manager will be notified.

### **4.4 Daily Tailgate Safety Meeting**

The HSO or the HSO designee will be responsible for conducting a daily tailgate safety meeting prior to start of any work activities. The contractor and workers will be responsible for attending daily tailgate safety meetings, as well as providing any additional insight into any possible hazards which might be anticipated or encountered throughout the day on the Site. The meeting will discuss any measures which will be implemented throughout the day to mitigate any hazards. The meetings are designed to create awareness of any hazards and their associated mitigation measures at the Site. If conditions at the Site change and new hazards are determined to be present, work will be stopped and an additional safety meeting will be conducted. The daily tailgate meetings discussions will be logged, as well as all who attended.

## 5.0 COMMUNICATIONS

A phone will be located on Site to be utilized by personnel conducting investigation. Cell phones will be the primary means of communicating with emergency support services/facilities.

## 6.0 PERSONAL PROTECTIVE EQUIPMENT

### 6.1 Personal Protective Equipment – General

The level of protection to be worn by field personnel will be defined and controlled by the HSO. Depending upon the type and levels of material present or anticipated at the site, varying degrees of protective equipment will be needed. If the possible hazards are unknown, a reasonable level of protection will be taken until sampling and monitoring results can ascertain potential risks. The levels of protection listed below are based on USEPA Guidelines. A list of the appropriate clothing for each level is also provided.

- Level A protection must be worn when a reasonable determination has been made that the highest available level of respiratory, skin, eye, and mucous membrane protection is needed. It should be noted that while Level A provides maximum available protection, it does not protect against all possible hazards. Consideration of the heat stress that can arise from wearing Level A protection should also enter into the decision-making process. Level A protection includes:
  - Open circuit, pressure-demand self-contained breathing apparatus (SCBA)
  - Totally encapsulated chemical resistant suit
  - Gloves, inner (surgical type)
  - Gloves, outer, chemical protective
  - Boots, chemical protective
- Level B protection must be used when the highest level of respiratory protection is needed, but hazardous material exposure to the few unprotected areas of the body (e.g., the back of the neck) is unlikely. Level B protection includes:
  - Open circuit, pressure-demand SCBA or pressure airline with escape air bottle
  - Chemical protective clothing: Overalls and long sleeved jacket; disposal chemical resistant coveralls; coveralls; one or two piece chemical splash suit with hood
  - Gloves, inner (surgical type)
  - Gloves, outer, chemical protective
  - Boots, chemical protective
- Level C must be used when the required level of respiratory protection is known, or reasonably assumed to be, not greater than the level of protection afforded by air purifying respirators; and hazardous materials exposure to the few unprotected areas of the body (e.g. the back of the neck) is unlikely. Level C protection includes:
  - Full or half face air-purifying respirator
  - Chemical protective clothing: Overalls and long-sleeve jacket; disposable chemical resistant coveralls; coveralls; one- or two-piece chemical splash suit
  - Gloves, inner (surgical type)
  - Gloves, outer, chemical protective
  - Boots, chemical protective

- Level D is the basic work uniform. It cannot be worn on any site where respiratory or skin hazards exist. Level D protection includes:
  - Safety boots/shoes
  - Safety glasses
  - Hard hat with optional face shield

Note that the use of SCBA and airline equipment is contingent upon the user receiving special training in the proper use and maintenance of such equipment.

## **6.2 Personal Protective Equipment – Site Specific**

Level D with some modification will be required when working on this Site. In addition to the basic work uniform specified by Level D protection, Nitrile gloves will be required when contact with soil and/or groundwater is likely. Hearing protection will be worn when power equipment is used to perform subsurface work. An upgrade to a higher level (Level C) of protection may occur if determined necessary by the HSO.

## **7.0 MONITORING PROCEDURES**

### **7.1 Monitoring During Site Operations**

All Site environmental monitoring should be accompanied by periodic meteorological monitoring of appropriate climatic conditions.

#### **7.1.1 Surface Soil Operation**

Monitoring will be performed by the HSO or field personnel during the conduct of work. A photoionization detector (PID) equipped with a 10.6 eV lamp will be utilized to monitor for the presence of volatile organic vapors within the breathing zone, the surface soil holes, and subsurface samples upon their retrieval. The PID will be field checked for calibration accuracy three times per day (morning, lunch, and end of day).

#### **7.1.2 Drilling / Test Pit Operations**

Monitoring will be performed by the HSO or drilling observer during the conduct of work. A photoionization detector (PID) equipped with a 10.6 eV lamp will be utilized to monitor for the presence of volatile organic vapors within the breathing zone, the borehole, and subsurface samples upon their retrieval. Drill cuttings and excavation spoils will also be monitored by use of the PID. The PID will be field checked for calibration accuracy three times per day (morning, lunch, and end of day). If subsurface conditions warrant, a combustible gas indicator (CGI) with oxygen alarm may also be used to monitor the borehole for the presence of combustible gases. Similar monitoring of fluids produced during well development will also be conducted.

#### **7.1.3 Soil Excavation and Trenching Operation**

Monitoring will be performed by the HSO or remedial observer during the conduct of work. A photoionization detector (PID) equipped with a 10.6 eV lamp will be utilized to monitor for the presence of volatile organic vapors within the breathing zone, the excavation or trench, and any subsurface samples upon their retrieval. Excavation and trenching spoils will also be monitored by use of the PID. The PID will be field checked for calibration accuracy three times per day (morning, lunch, and end of day). If subsurface conditions warrant, a CGI with oxygen alarm may also be used to monitor the borehole for the presence of combustible gases.

### **7.2 Action Levels**

If readings on the PID exceed 10 ppm for more than fifteen minutes consecutively, then personal protective equipment should be upgraded to Level C. The air purifying respirator used with Level C protective equipment must be equipped with organic vapor cartridges. If readings on the explosive gas meter are within a range of 10%-25% of the lower exposure limit (LEL) then continuous monitoring will be implemented. Readings above 25% of the LEL indicate the

potential for an explosive condition. Sources of ignition should be removed and the Site should be evacuated.

### **7.3 Personal Monitoring Procedures**

Personal monitoring shall be performed as a contingency measure in the event that VOC concentrations are consistently above the 10-ppm action level as detected by the PID. If the concentration of VOCs is above this action level, then amendments to the HASP must be made before work can continue at the Site.

## 8.0 SECTION 8 – SAFETY CONSIDERATIONS FOR SITE OPERATIONS

### 8.1 General

Standard safe work practices that will be followed include:

- Do not climb over/under drums, or other obstacles.
- Do not work on the Site alone.
- Practice contamination avoidance, on and off-site.
- Plan activities ahead of time, and use caution when conducting concurrently running activities.
- No eating, drinking, chewing or smoking is permitted on the Site.
- Due to the unknown nature of waste placement at the Site, extreme caution should be practiced during excavation activities.
- Apply immediate first aid to any and all cuts, scratches, abrasions, etc.
- Be alert to your own physical condition. Watch your buddy for signs of fatigue, exposure, etc.
- A work/rest regimen will be initiated when ambient temperatures and protective clothing create a potential heat or cold stress situation.
- No work will be conducted without adequate natural light or without appropriate supervision.
- Task safety briefings will be held prior to onset of task work.
- Ignition of flammable liquids within or through improvised heating devices (barrels, etc.) or space heaters is forbidden.
- Entry into areas of spaces where toxic or explosive concentrations of gases or dust may exist without proper equipment is prohibited.
- Any injury or unusual health effect must be reported to the Site HSO.
- Prevent splashing or spilling of potentially contaminated materials.
- Use of contact lenses is prohibited while on site.

- Beards and other facial hair that would impair the effectiveness of respiratory protection are prohibited if respiratory protection is necessary.
- Field crew members should be familiar with the physical characteristics of investigations, including but not limited to:
  - Wind direction in relation to potential sources
  - Accessibility to co-workers, equipment, and vehicles
  - Communication
  - Hot zones (areas of known or suspected contamination)
  - Site access
  - Nearest water sources
- The number of personnel and equipment in potentially contaminated areas should be minimized consistent with site operations.

## 8.2 Field Operations

The HSO or designee will be present on-site during all intrusive work, e.g., drilling operations, excavations, trenching, and will provide monitoring to oversee that appropriate levels of protection and safety procedures are utilized by C&S Engineers, Inc., personnel. The use of salamanders or other equipment with an open flame is prohibited and the use of protective clothing, especially hard hats and boots, will be required during drilling or other heavy equipment operations.

## 8.3 General Asbestos Safety

Asbestos exposure is primarily an inhalation hazard. OSHA compliant respiratory protection should be worn if there is risk of asbestos becoming airborne. Personal Protective Equipment including protective clothing (suits/gloves, etc.) may be necessary to avoid contaminating the worker and/or the site.

Procedural Precautions - The sampler should be aware that disruption of asbestos-containing materials can create the potential for cross contamination when conducting bulk asbestos sampling.

The Sampler should take the following precautions to avoid cross contamination as well as disruption of material while sampling:

- The sampling tool must be cleaned with amended water after every sample is collected, or a different clean tool must be used.
- The sampler must avoid touching the material being sampled (utilize gloves).
- The area being sampled must be sufficiently wet before collecting the sample.

- The space left after sampling must be sealed with repair/patch material to reduce the chance of airborne exposure.

The object or material sampled should be minimally disturbed during the sampling process.

## 9.0 SECTION 9 – DECONTAMINATION PROCEDURES

### 9.1 General Decontamination

Decontamination involves physically removing contaminants and/or converting them chemically into innocuous substances. Only general guidance can be given on methods and techniques for decontamination. Decontamination procedures are designed to:

- Remove contaminant(s).
- Avoid spreading the contamination off Site.
- Avoid exposing unprotected personnel off Site to contaminants.

### 9.2 Contamination Avoidance

Contamination avoidance is the first and best method for preventing spread of contamination from a hazardous site. Each person involved in site operations must practice the basic methods of contamination avoidance listed below. Additional precautions may be required in the HASP.

- Know the limitations of all protective equipment being used.
- Use the proper tools necessary to safely conduct the work.

### 9.3 Reducing Contamination

Specific methods that may reduce the chance of contamination are:

- Use of remote sampling techniques.
- Opening containers by non-manual means.
- Bagging monitoring instruments.
- Use of drum grapplers.
- Watering down dusty areas.

### 9.4 Equipment Decontamination

Equipment which will need to be decontaminated includes tools, monitoring equipment, and personal protective equipment. Items to be decontaminated will be brushed off, rinsed, and dropped into a plastic container supplied for that purpose. They will then be washed with a detergent solution and rinsed with clean water. Instrumentation that is contaminated during field



operations will be carefully wiped down. Heavy equipment, if utilized for operations where it may be contaminated, will have prescribed decontamination procedures to prevent contaminant materials from potentially leaving the Site. On-site contractors, such as drillers or backhoe operators, will be responsible for decontaminating all construction equipment prior to demobilization.

## 10.0 DISPOSAL PROCEDURES

All discarded materials, waste materials, or other objects shall be handled in such a way as to reduce or eliminate the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary and segregated for proper disposal. All contaminated waste materials shall be disposed of as required by the provisions included in the contract and consistent with regulatory provisions. All non-contaminated materials shall be collected and bagged for appropriate disposal.

Investigation derived waste (IDW) that is free from physical indications of contamination such as odors, staining, and sheens will be placed back into the borehole of origin or in the case of well water allowed to infiltrate the Site surface. In cases where physical indications of contamination are evident, the affected media will be containerized per NYSDOT requirements pending proper disposal. Samples may be analyzed for toxicity characteristic leaching procedure (TCLP) VOCs, SVOCs, pesticides, herbicides, and metals; PCBs; pH (corrosivity), flash point (ignitability); reactivity; and paint filter (free liquids).

## 11.0 EMERGENCY RESPONSE PROCEDURES

As a result of the hazards at the Site, and the conditions under which operations are conducted, there is the possibility of emergency situations. This section establishes procedures for the implementation of an emergency plan.

### 11.1 Emergency Coordinator

*Emergency Coordinator:..... Cody Martin..... Work Phone: (716) 955-3021*

The Emergency Coordinator or his on-site designee will, in coordination with the Authority / Agency having Jurisdiction, implement the emergency response procedures whenever conditions at the site warrant such action. The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency transport of C&S personnel or workers as necessary, and notification of emergency response units (**refer to phone listing** in the beginning of this HASP) and the appropriate management staff.

### 11.2 Evacuation

In the event of an emergency situation, such as fire, explosion, significant release of toxic gases, etc., all personnel will evacuate and assemble in a designated assembly area. The Emergency Coordinator or his on-site designee will have authority to contact outside services as required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The Emergency Coordinator or his on-site designee must see that access for emergency equipment is provided and that all ignition sources have been shut down once the emergency situation is established. Once the safety of all personnel is established, the Fire Department and other emergency response groups will be notified by telephone of the emergency.

### 11.3 Potential / Actual Fire or Explosion

Immediately evacuate the Site and notify local fire and police departments, and other appropriate emergency response groups, if LEL values are above 25% in the work zone or if an actual fire or explosion has taken place.

### 11.4 Environmental Incident (Spread or Release of Contamination)

Control or stop the spread of contamination if possible. Notify the Emergency Coordinator and the Project Manager. Other appropriate response groups will be notified as appropriate.

## 11.5 Personnel Injury

Emergency first aid shall be applied on-site as necessary. Then, decontaminate (en route if necessary) and transport the individual to nearest medical facility if needed. The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. A map of directions to the nearest hospital is shown in **Appendix A**.

## 11.6 Personnel Exposure

- Skin Contact: Use copious amounts of soap and water. Wash/rinse affected area thoroughly, and then provide appropriate medical attention. Eyes should be thoroughly rinsed with water for at least 15 minutes.
- Inhalation: Move to fresh air and/or, if necessary, decontaminate and transport to emergency medical facility.
- Ingestion: Decontaminate and transport to emergency medical facility.
- Puncture Wound/Laceration: Decontaminate, if possible, and transport to emergency medical facility.

## 11.7 Adverse Weather Conditions

In the event of adverse weather conditions, the HSO will determine if work can continue without sacrificing the health and safety of field workers.

## 11.8 Incident Investigation and Reporting

In the event of an incident, procedures discussed in the Medical Emergency/Incident Response Protocol, presented in **Appendix B** of this HASP, shall be followed.

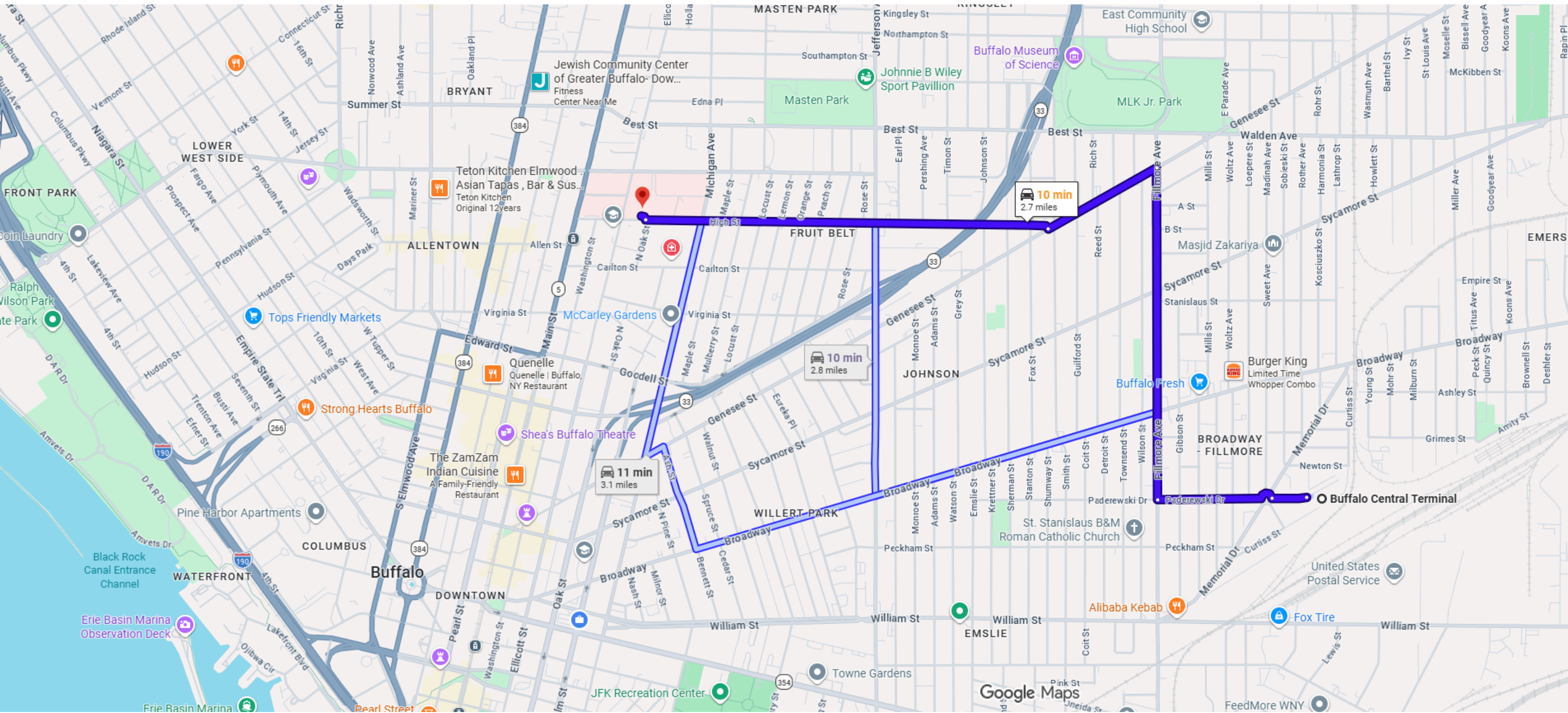
## **Appendices**

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## **Appendix A**

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### Map and Directions to Hospital



Map data ©2026 Google 1000 ft

-  **via Fillmore Ave and High St** **10 min**  
Fastest route, despite the usual traffic 2.7 miles
-  **via Broadway and Jefferson Ave** **10 min**  
Some traffic, as usual 2.8 miles
-  **via Broadway** **11 min**  
3.1 miles

## **Appendix B**

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### Guidance on Incident Investigation and Reporting

# Medical Emergency / Incident Response Protocol

Prepared by:



C&S Engineers, Inc.  
141 Elm Street, Suite 100  
Buffalo, New York 14203



## **SECTION 1 – PURPOSE**

From time to time employees of C&S Engineers, Inc. will sustain an injury while working on the job. While every effort is being made to prevent this, in the event of an injury or illness on the job, the following procedures will be implemented. This format may also be utilized in the event of a property damage incident.

## **SECTION 2 – SCOPE**

This guideline applies to all C&S Engineers, Inc. job sites and employees.

## **SECTION 3 – GUIDELINES**

### **3.1 First Response Procedures**

Upon notification or awareness of an incident/accident with injuries or illness the Emergency Coordinator or his On-Site Designee will:

1. Ensure that the injured employee is receiving immediate first aid and medical care.
2. Notify Emergency Services (911) if injuries are severe.
3. Stabilize the work area; ensure that no one else can be injured.
4. Notify the Project Manager at the earliest possible convenience.
5. Notify the Owner/Client at the earliest possible convenience.

To assist the Health and Safety Manager in the root cause analysis, the Emergency Coordinator or his On-Site Designee will also make an attempt to:

1. Obtain the names and phone numbers of witnesses.
2. Preserve the accident scene if possible for analysis.

### **3.2 Injury Management**

1. If the patient is stable with non-life threatening injuries, the foreman will ensure the employee is transported to the emergency medical facility listed in Section 1 of the HASP. Directions to the nearest emergency medical facility are located in **Attachment A** of the HASP.

**At no time will an injured employee drive themselves to medical care.**

2. If the patient has serious or life threatening injuries, the emergency coordinator or his on-site designee will notify the emergency services for the area for treatment and transport to a hospital or emergency room. Serious injuries can be considered but not limited to head injuries, loss of consciousness, severe laceration or amputation, fractured bones, burns and eye injuries.

3. Following the treatment and care of the injured employee, the emergency coordinator or his on-site designee and the project manager will initiate the completion of the first injury report. The Health & Safety Manager will assist.

### **3.3 Project Manager**

1. Upon notification of a personal injury or illness on the job site, will notify C&S Engineers, Inc, President and Corporate Legal and C&S Companies Health and Safety Manager.
2. Will report to the worksite to initiate the first injury report.
3. Will report to the treatment facility to check on the well being of the injured employee.
4. The project manager will ensure that the treatment facility is aware that this is a workers compensation case.
5. Will assist the Health and Safety Manager in the analysis of the incident.

### **3.4 Health & Safety Manager**

1. Upon notification of the personal injury will determined if it is necessary to report to the treatment facility or the accident site, depending on the nature of the injuries and the circumstances of the accident.
2. Will report to the worksite to begin a root cause analysis investigation of the accident.
3. The investigation may include interview of witnesses, field crew , and project manager, the photographing of the scene, reconstruction of the accident scene, using test instruments and taking measurements. The Health and Safety Manager may draw diagrams from the information learned.
4. The Health and Safety Manager will work with the owner/client as necessary to investigate the accident.
5. The Health & Safety manager will ensure that the site is safe to resume work.
6. The Health & Safety Manager shall initiate the New York State Compensation form requirements (C-2) and forward a copy of the C-2 to the C & S Engineers, Inc. controller for transmittal to the Compensation Carrier within 8 hrs of notification of the incident or by the end of the next business day.
7. The Health and Safety manager, upon completion of the investigation, will provide the
8. Project Manager with a written investigative report (copy to the President)
9. The accident will be reviewed at the next Project Managers meeting with the intent to prevent further or similar events on other projects.
10. The Health & Safety Manager will assess the incident to determine OSHA record ability and make record if necessary on the OSHA 300 form, within five working days.



## **SECTION 4 - INCIDENT RESPONSE**

### **3.1 Purpose**

To prevent the occurrence of accidents on C&S Engineers, Inc., work sites and to establish a procedure for investigation and reporting of incidents occurring in, or related to C&S work activities.

### **3.2 Scope**

Applies to all incidents related to C&S Engineers, Inc. work activities.

### **3.3 Definitions**

Accident - An undesired event resulting in personal injury and/or property damage, and/or equipment failure.

Fatality - An injury or illness resulting in death of the individual.

Incident - Any occurrence which results in, or could potentially result in, the need for medical care or property damage. Such incidents shall include lost time accidents or illness, medical treatment cases, unplanned exposure to toxic materials or any other significant occurrence resulting in property damage or in "near misses."

Incidence Rate - the number of injuries, illnesses, or lost workdays related to a common exposure base of 100 full-time workers. The rate is calculated as:

$$N/EH \times 200,000$$

N = number of injuries and illnesses or lost workday cases; EH = total hours worked by all associates during calendar year. 200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year).

Injury - An injury such as a cut, fracture, sprain, amputation, etc. which results from a work accident or from a single instantaneous event in the work environment.

Lost Workday Case - A lost workday case occurs when an injured or ill employee experiences days away from work beginning with the next scheduled work day. Lost workday cases do not occur unless the employee is effected beyond the day of injury or onset of illness.

Recordable Illness - An illness that results from the course of employment and must be entered on the OSHA 300 Log and Summary of Occupational Injuries and Illnesses. These illnesses require medical treatment and evaluation of work related injury. For example, dermatitis, bronchitis, irritation of eyes, nose, and throat can result from work and non-work related incidents.



Recordable Injury - An injury that results from the course of employment and must be entered on the OSHA 300 Log and Summary of Occupational Injuries and Illnesses. These injuries require medical treatment; may involve loss of consciousness; may result in restriction of work or motion or transfer to another job; or result in a fatality.

Near Miss - An incident which, if occurring at a different time or in a different personnel or equipment configuration, would have resulted in an incident.

### **3.4 Responsibilities**

Employees - It shall be the responsibility of all C&S Engineers, Inc. employees to report all incidents as soon as possible to the HSC, regardless of the severity.

Human Resources - has overall responsibility for maintaining accident/ incident reporting and investigations according to current regulations and recording injuries/ illness on the OSHA 300 log, and posting the OSHA 300 log.

Emergency Coordinator - It is the responsibility of the Emergency Coordinator to investigate and prepare an appropriate report of all accidents, illnesses, and incidents occurring on or related to C&S Engineers, Inc. work. The Emergency Coordinator shall complete Attachment A within 24 hours of the incident occurrence.

Health and Safety Manager (HSM) - It is the responsibility of the HSM to investigate and prepare an appropriate report of all lost time injuries and illnesses and significant incidents occurring on or related to C&S Companies. The HSM shall maintain the OSHA 300 form.

Project Managers (PM) - It shall be the PM's responsibility to promptly correct any deficiencies in personnel, training, actions, or any site or equipment deficiencies that were determined to cause or contribute to the incident investigated.

## **SECTION 5 – GUIDELINES**

### **3.5 Incident Investigation**

The Project Manager will immediately investigate the circumstances surrounding the incident and will make recommendations to prevent recurrence. The HSM shall be immediately notified by telephone if a serious accident/ incident occurs. The incident shall be evaluated to determine whether it is OSHA recordable. If the incident is determined to be OSHA 300 recordable, it shall be entered on the OSHA 300 form.

The Project Manager with assistance from the HSM must submit to the office an incident report form pertaining to any incident resulting in injury or property damage.



### **3.6 Incident Report**

The completed incident report must be completed by the Project Manager within 12 hours of the incident and distributed to the HSM, and Human Resources. This form shall be maintained by Human Resources for at least five years for all OSHA recordable cases. This form serves as an equivalent to the OSHA 101 form.

### **3.7 Incident Follow-up Report**

The Incident Follow-Up Report (Attachment B) shall be distributed with the Incident Report within one week of the incident. Delay in filing this report shall be explained in a brief memorandum.

### **3.8 Reporting of Fatalities or Multiple Hospitalization Accidents**

Fatalities or accidents resulting in the hospitalization of three or more employees must be reported to OSHA verbally or in writing within 8 hours. The report must contain 1) circumstances surrounding the accident(s), 2) the number of fatalities, and 3) the extent of any injuries.

### **3.9 OSHA 300A Summary Form**

Recordable cases must be entered on the log within six workdays of receipt of the information that a recordable case has occurred. The OSHA log must be kept updated to within 45 calendar days.

OSHA 300 forms must be updated during the 5 year retention period, if there is a change in the extent or outcome of an injury or illness which affects an entry on a log. If a change is necessary, the original entry should be lined out and a corrected entry made on that log. New entries should be made for previously unrecorded cases that are discovered or for cases that initially weren't recorded but were found to be recordable after the end of the year. Log totals should also be modified to reflect these changes.

### **3.10 Posting**

The log must be summarized at the end of the calendar year and the summary must be posted from February 1 through May 31.

### **3.11 OSHA 300A**

Facilities selected by the Bureau of Labor Statistics (BLS) to participate in surveys of occupational injuries and illnesses will receive the OSHA 300A. The data from the annual summary on the OSHA 300 log should be transferred to the OSHA 300A, other requested information provided and the form returned as instructed by the BLS.



### **3.12 Access to OSHA Records**

All OSHA records (accident reporting forms and OSHA 300 logs) should be available for inspection and copying by authorized Federal and State government officials.

Employees, former employees, and their representatives must be given access for inspection and copying to only the log, OSHA No. 300, for the establishment in which the employee currently works or formerly worked.

## **SECTION 6 – REFERENCES**

29 CFR Part 1904

## **7.0 ATTACHMENTS**

Attachment A - Incident Investigation Form

Attachment B - Incident Follow-Up Report

Attachment C - Establishing Recordability



**ATTACHMENT A**

**INCIDENT INVESTIGATION FORM**

Accident investigation should include:

Location: \_\_\_\_\_

Time of Day: \_\_\_\_\_

Accident Type: \_\_\_\_\_

Victim: \_\_\_\_\_

Nature of Injury: \_\_\_\_\_

Released Injury: \_\_\_\_\_

Hazardous Material: \_\_\_\_\_

Unsafe Acts: \_\_\_\_\_

Unsafe Conditions: \_\_\_\_\_

Policies, Decisions: \_\_\_\_\_

\_\_\_\_\_

Personal Factors: \_\_\_\_\_

\_\_\_\_\_

Environmental Factors: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**ATTACHMENT B**

**INCIDENT FOLLOW-UP REPORT**

Date \_\_\_\_\_

Foreman: \_\_\_\_\_

Date of Incident: \_\_\_\_\_

Site: \_\_\_\_\_

Brief description of incident: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Outcome of incident: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Physician's recommendations: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date the injured returned to work: \_\_\_\_\_

Project Manager Signature: \_\_\_\_\_

Date: \_\_\_\_\_

ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM



## ATTACHMENT C

### ATTACHMENT ESTABLISHING RECORDABILITY

1. Deciding whether to record a case and how to classify the case.

Determine whether a fatality, injury or illness is recordable.

A fatality is recordable if:

- Results from employment

An injury is recordable if:

- Results from employment and
- It requires medical treatment beyond first aid or
- Results in restricted work activity or job transfer, or
- Results in lost work day or
- Results in loss of consciousness

An illness is recordable if:

- It results from employment

2. Definition of "Resulting from Employment"

Resulting from employment is when the injury or illness results from an event or exposure in the work environment. The work environment is primarily composed of: 1) The employer's premises, and 2) other locations where associates are engaged in work- related activities or are present as a condition of their employment.

The employer's premises include company rest rooms, hallways, cafeterias, sidewalks and parking lots. Injuries occurring in these places are generally considered work related.

The employer's premises EXCLUDES employer controlled ball fields, tennis courts, golf courses, parks, swimming pools, gyms, and other similar recreational facilities, used by associates on a voluntary basis for their own benefit, primarily during off work hours.

Ordinary and customary commute, is not generally considered work related.

Employees injured or taken ill while engaged in consuming food, as part of a normal break or activity is not considered work related. Employees injured or taken ill as the result of smoking, consuming illegal drugs, alcohol or applying make up are generally not considered work related. Employee injured by an authorized horseplay is generally not considered work related, however, an employee injured as a result of a fight or other



workplace violence act, may be considered work related. Associates who travel on company business are considered to be engaged in work related activities all the time they spend in the interest of the company. This includes travel to and from customer contacts, and entertaining or being entertained for purpose of promoting or discussing business. Incidents occurring during normal living activities (eating, sleeping, recreation) or if the associate deviates from a reasonably direct route of travel are not considered OSHA recordable.

### 3. Distinction between Medical Treatment and First Aid.

First aid:

Any one-time treatment, and any follow up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care. Such one time treatment, and follow up visit for the purpose of observation, is considered first aid even though provided by a physician or registered professional personnel.

Medical Treatment (recordable):

- a) Must be treated only by a physician or licensed medical personnel.
- b) Impairs bodily function (i.e. normal use of senses, limbs, etc.).
- c) Results in damage to physical structure of a non-superficial nature (fractures).
- d) Involves complications requiring follow up medical treatment.

## **Appendix E**

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### Quality Assurance Project Plan



**C&S Engineers, Inc.**  
141 Elm Street  
Buffalo, New York 14203

# Quality Assurance Project Plan

**Former Erie Rail Yard Site  
250 Baitz Avenue and 1000 Bailey Avenue  
City of Buffalo, Erie County, New York  
BCP Site No. C915416**

**Prepared for:**  
UDC-BCC North Buffalo, LLC  
100 Corporate Parkway Suite 500  
Amherst, NY 14226

April 2026

C&S Project No. 179B001001



# Quality Assurance Project Plan

**Former Erie Rail Yard Site  
250 Baitz Avenue and 1000 Bailey Avenue  
City of Buffalo, Erie County, New York  
BCP Site No. C915416**

**Prepared for:**  
UDC-BCC North Buffalo, LLC  
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**Prepared by:**  
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April 2026

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## 1.0 INTRODUCTION

C&S' Quality Control (QC) Program is a vital part of its approach to remedial investigations. Through our thorough QC program, our firm is able to provide accurate and dependable data. QC also provides safe working conditions for field staff.

The QC program contains procedures, which provide for collected data to be properly evaluated, and which document that quality control procedures have been followed in the collection of samples. The QC program represents the methodology and measurement procedures used in collecting quality field data. This methodology includes the proper use of equipment, documentation of sample collection, and sample handling practices.

Procedures used in the firm's QC program are consistent with federal, state, and local regulations, as well as, appropriate professional and technical standards.

This QC program has been organized into the following areas:

- QC Objectives
- Field Sampling Techniques
  - Procedures
  - Preparation
  - Measurement
  - Decontamination
- Sample Management

## 2.0 QUALITY CONTROL OBJECTIVES

### 2.1 Data Quality Objectives

Data Quality Objectives (DQOs) are statements which describe the desired quality of data necessary to meet the objectives of the sampling program. The DQOs for the site sampling program were formulated during the scoping effort and developed as part of this Plan. The general steps followed in preparation of the DQOs were as follows:

- Identification of the media to be sampled – Identifies the media being investigated (e.g., ground water, surface soil).
- Identification of the data uses – Identifies the intended use of the data according to the following:
  - Site Characterization – Data are used to determine the composition, nature, and extent of contamination.
  - Risk Assessment – Data are used to evaluate the actual or potential risks posed by contaminants determined to be present on-site. Particular attention is given to sampling at locations where human exposure is possible.
  - Health and Safety Plan (HASP) – Data are used to establish the level of protection needed for on-site workers during site characterization activities.
  - Monitoring – Data are used during the monitoring of the remedial action to assess the effectiveness of such action.
  - PRP Enforcement – Data are used to help establish potentially responsible parties (PRP's).
  - Evaluation of Alternatives – Data are used to evaluate various proposed remedial technologies and assist in proper design of alternatives.
- Identification of the data types – Identifies what types of analyses are to be performed.
- Sample Collected – Describes the sample types to be collected.
  - Environmental – Refers to a specific media sampled such as water, soil, air, or biological.
  - Source – Refers to sampling an actual contamination source.
  - Grab – A discrete sample representative of a specific location.
  - Composite – A sample that represents a mixture of a number of grab samples that represents the average properties over the extent of areas sampled.
  - Biased – Sampling that focuses on a specific area of expected contamination or uncontaminated area (background).
- Identification of the data quality needs – Identifies the analytical options available to support data collection activities and are identified as follows:
  - Level I: Field Screening – portable type instruments which provide real-time data.
  - Level II: Field Analysis – portable analytical instruments in an on-site lab or

- transported to the site.
  - Level III: Standard Analytical Protocols – standard analytical protocols or without the NYSDEC Analytical Services Protocol (ASP) (2000) deliverables / reportables documentation.
  - Level IV: NYSDEC ASP Reportables / Deliverables – rigorous QA / QC protocols and reportables / deliverables documentation; NYSDEC ASP (2000) Category B deliverables.
  - Level V: Non-Standard – methods which have been modified to meet specific site study or remediation needs or by use of some other specialized analytical methods that cannot be obtained through standard or typical avenues of analytical support.
- Identification of Data Quality Factors – Describes factors which influence the quality or quantity of data to be collected. Primary contaminants and associated levels of concern are identified concerning ARARs or potential risks. The required detection limit are also given or referenced.
  - Identification of QA / QC Samples – Specifies additional samples to be collected to support Quality Assurance / Quality Control (QA / QC) procedures. Additional samples to be collected could include:
    - Matrix Spike/Matrix Spike Duplicates – Matrix spike and matrix spike duplicate samples are collected as a duplicate sample to which the analytical laboratory will add known amounts of target analytes. These QA / QC samples are intended to assess the extraction procedure used by the laboratory.
    - Blind Duplicates – Blind duplicates are a duplicate of another sample submitted for analysis. The location of the sample is recorded in the field book and not disclosed on the chain of custody. These QA / QC samples are intended to assess the repeatability of analysis by the laboratory.
    - Field Blanks – Field (equipment) blanks are samples which are obtained by running analyte-free water through the sample collection equipment in a way that is identical to the sample collection procedures. Field blanks may be used during QA / QC procedures to evaluate if sampling equipment has contributed contaminants to the samples.
    - Trip Blanks – Trip blanks are samples which are prepared prior to the sampling event in the same type of sample container and are kept with the collected samples throughout the sampling event unit analysis. Trip blank vials are not opened in the field and are analyzed for volatile organics only.

## 2.2 Sampling Procedures

All sampling objectives, locations, and procedures have been included as the Remedial Investigation Work Plan (RIWP) and are further described in **Section 3.0**. Items including Field Measurement Techniques, General Field Decontamination, and Sample Management have also been included in **Section 3.0** and **Section 4.0**.

### 2.3 Laboratory Certification and Coordination

The Environmental Laboratory Approval Program (ELAP) certification is an accreditation issued by the New York State Department of Health (NYSDOH). Such laboratories have demonstrated that they consistently ensure the accuracy and reliability of samples analyzed. All chemical analyses for samples from the site will be completed by an ELAP laboratory capable of performing project specific analyses as indicated in this QA / QC plan. The project QA / QC Officer will also be responsible for all project related laboratory coordination.

Supporting documentation related to per- and polyfluoroalkyl substances (PFAS) analysis, such as standard operating procedures (SOPs), analyte lists, and method detection limits (MDLs) are provided in **Appendix A**.

### 2.4 Analytical Methodologies

Sampling and analysis will be performed for the Target Compound List (TCL) parameters including volatiles. The specific analyses will be conducted according to the following NYSDEC ASP 2000 methodologies:

**Table 2-1: ASP 2000 Methodologies**

Parameter Group	USEPA Analysis Method
Volatiles	8260C or TO-15 for air
Semivolatiles	8270D
PCBs	8082A
Pesticides	8081B
Herbicides	8151A
Metals / Inorganics	6010D, 7471B, 9010C/9012B, 7196A
PFOA/PFOS	1633

Samples will be analyzed by Eurofins or Pace and the data will be presented in Category B reportables / deliverables format.

### 2.5 Analytical Quality Control

Analytical quality control for this Project will be consistent with the methodology and quality assurance/quality control requirements in the NYSDEC ASP 2000.

The tables on the following page detail sample volumes, containers, preservation, and holding time for typical analytes.

## 2.6 Data Usability Summary Report

A Data Usability Summary Report (DUSR) will be prepared by Environmental Data Usability (EDU) consistent with NYSDECs Guidance for the Development of Quality Assurance Plans and Data Usability Summary Reports as given in DER-10. The main objective of the DUSR is to determine whether the data presented meets the project specific needs for data quality and data use.

**Table 2-2: Water Samples**

Type of Analysis	Type and Size of Container	Number of Containers and Requirements	Preservation	Holding Time Until Extraction / Analysis
VOCs	40-mL VOA vial	Three (3); fill completely; no headspace	HCl, pH<2 Cool to 4°C	14 days
SVOCs	250-mL amber glass jar, Teflon lined	Two (2); fill completely	Cool to 4°C	7 days to extraction
PCBs	125-mL amber glass jar, Teflon lined	Two (2); fill completely	Cool to 4°C	365 days to extraction
Pesticides	125-mL amber glass jar, Teflon lined	Two (2); fill completely	Cool to 4°C	7 days to extraction
Herbicides	1,000-mL amber glass jar, Teflon lined	Two (2); fill completely	Cool to 4°C	7 days to extraction
Total Metals, including Hg	250-mL plastic	One (1); fill completely	HNO <sub>3</sub> , pH<2 Cool to 4°C	180 days (28 days for mercury)
Dissolved Metals, including Hg	250-mL plastic	One (1); fill completely; filtered	HNO <sub>3</sub> , pH<2 Cool to 4°C	180 days (28 days for mercury)
Hexavalent Chromium	500-mL plastic	One (1); fill completely	Cool to 4°C	24 hours
Cyanide	250-mL plastic	One (1); fill completely	NaOH, pH>12 Cool to 4°C	14 days
1,4-Dioxane	250-mL amber glass jar, Teflon lined	Two (2); fill completely	Cool to 4°C	7 days to extraction
PFAS	250-mL plastic	Two (2); fill completely	Cool to 4°C	28 days to extraction

All sample bottles will be prepared in accordance with USEPA bottle washing procedures. Consult with laboratory as glassware may vary by laboratory. Holding time begins at the time of sample collection.

**Table 2-3: Soil Samples**

Type of Analysis	Type and Size of Container	Number of Containers and Requirements	Preservation	Holding Time Until Extraction / Analysis
VOCs	40-mL VOA vial and Terracore	One (1); 5-15 grams	MeOH Cool to 4°C	14 days
	40-mL VOA vial and Terracore	Two (2); 5 grams each	Water Cool to 4°C	48 hours to freeze 14 days to analysis
SVOCs	4-oz amber glass jar, Teflon lined	One (1); fill completely	Cool to 4°C	14 days to extraction
PCBs	4-oz amber glass jar, Teflon lined	One (1); fill completely	Cool to 4°C	365 days to extraction
Pesticides	4-oz amber glass jar, Teflon lined	One (1); fill completely	Cool to 4°C	14 days to extraction
Herbicides	4-oz amber glass jar, Teflon lined	One (1); fill completely	Cool to 4°C	14 days to extraction
Metals, including Hg	4-oz amber glass jar	One (1); fill completely	Cool to 4°C	180 days (28 days for mercury)
Hexavalent Chromium	4-oz amber glass jar	One (1); fill completely	Cool to 4°C	30 days
Cyanide	4-oz amber glass jar	One (1); fill completely	Cool to 4°C	14 days
1,4-Dioxane	4-oz amber glass jar, Teflon lined	One (1); fill completely	Cool to 4°C	14 days to extraction
PFAS	8-oz plastic	One (1); fill completely	Cool to 4°C	90 days to extraction

All sample bottles will be prepared in accordance with USEPA bottle washing procedures.  
Consult with laboratory as glassware may vary by laboratory.  
Holding time begins at the time of sample collection.

## 3.0 FIELD SAMPLING PLAN

### 3.1 Sampling Procedures

The following sections provide procedures for collecting a variety of samples, not all of which will be needed at this site.

#### 3.1.1 Preparation for Sampling

The sample collection technique is of prime importance to assure the integrity of the collected sample. The following techniques include provisions so that:

- A representative sample is obtained;
- Contamination of the sample is minimized;
- The sample is properly preserved; and
- An acceptable Chain-of-Custody record is maintained.

The QA / QC Sampling Component of the Plan includes:

- Incorporation of accepted sampling techniques referenced in the sampling plan;
- Procedures for documenting any field actions contrary to the QA / QC Plan;
- Documentation of all preliminary activities such as equipment check-out, calibrations, and container storage and preparation;
- Documentation of field measurement quality control data (quality control procedures for such measurements shall be equivalent to corresponding QC procedures);
- Documentation of field activities;
- Documentation of post-field activities including sample shipment and receipt, field team debriefing, and equipment check-in;
- Generation of quality control samples including duplicate samples, field blanks, equipment blanks, and trip blanks;
- The use of these samples in the context of data evaluation with details of the methods employed (including statistical methods) and of the criteria upon which the information generated will be judged; and

- The number of QA / QC samples generally required are shown in the following table. When there is a disagreement with QA / QC sample numbers and types, between this document and a Work Plan, the Work Plan shall prevail.

**Table 3-1: QA / QC Samples**

<b>Sample Type</b>	<b>Analysis</b>	<b>Number</b>	<b>Note</b>
MS / MSD	Full Suite	Every sample batch, or minimum of 5% (1 per 20)	Two additional samples at a given location
Trip Blank	VOC	One per day or 5% (1 per 20), whichever is more frequent	Vials of clean water provided by laboratory. Packed with collected samples.
Field Blank	PFAS	One per day or 5% (1 per 20), or whichever is more frequent	Clean water passed through / over decontaminated sample collection equipment / tubing
Blind Duplicate	Same as field sample	Every sample batch, or minimum of 5% (1 per 20)	An additional sample at a given location

The personnel responsible for collection of groundwater, soil, air, miscellaneous media, and petroleum spill remediation / verification samples will be familiar with standard sampling procedures and follow the appropriate protocol. Field records will be maintained in bound notebooks with numbered pages to document daily instrument calibration, locations sampled, field observations, and weather conditions. Each page will be dated and signed by the sampler. Each notebook will be numbered and a log of notebooks will be maintained by the project manager.

Prior to sampling, all equipment must be procured and accommodations for sample container delivery, and sample shipment must be made. The following is a list of general equipment that would be on hand for sampling events. Special equipment for each sampling event is presented in the section describing that specific sampling event.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Field Data Sheets</li> <li>• Chain-of-Custody forms</li> <li>• Engineers tape and folding ruler with 0.01-foot intervals</li> <li>• Field Record Sheets</li> <li>• Latex gloves</li> <li>• Face-safety shield</li> <li>• Tyvek coveralls</li> <li>• Respirators</li> <li>• Photoionization detector</li> <li>• Bio-degradable phosphate free detergent</li> </ul> | <ul style="list-style-type: none"> <li>• Coolers and ice (no blue ice)</li> <li>• Drums</li> <li>• Sample bottles</li> <li>• Aluminum foil</li> <li>• Duct and filament tape</li> <li>• Tap water</li> <li>• Distilled water</li> <li>• Laboratory grade methanol and hexane</li> <li>• Wash buckets</li> <li>• Decontamination towels / cloths</li> <li>• Large disposal containers</li> <li>• Large plastic sheets</li> </ul> |
|--|---|

## 3.2 Sample Collection Techniques

### 3.2.1 Surface Soil Sampling

Surface soil samples will be collected at the locations and depths indicated in the Work Plan. When sampling is conducted in areas where a vegetative turf has been established, a pre-cleaned trowel or shovel will be used to remove the turf so that it may be replaced at the conclusion of sampling. Samples will then be collected using a pre-cleaned, stainless steel spoon. When the sample is obtained, it will be deposited into a pre-cleaned stainless steel bowl or plastic pail for mixing prior to filling the sample containers. The soil will be mixed thoroughly until the material is homogenized. At that point, the soil will be placed into the laboratory provided containers.

Once removed from the ground the soil will immediately be observed for soil characteristics, including general soil type (sand, silt, clay), moisture, and evidence of impairment ((e.g. petroleum or chemical odors, staining, volatile organic vapors as measured by a photoionization detector (PID)). The PID will be calibrated daily (and more often as required by the manufacturer's data) prior to use in the field, using calibration test gases.

When PFAS sampling / testing is required, no sampling equipment components or sample containers should come into contact with aluminum foil, LDPE, glass, or Teflon tape. Acceptable equipment includes stainless steel spoons and bowl, HDPE containers, and steel shovels or augers that are not coated.

### 3.2.2 Subsurface Soil Sampling

#### 3.2.2.1 Direct Push Drilling

Generally, soil borings will be advanced with a Geoprobe direct push sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The Geoprobe utilizes a four to five-foot macrocore sampler, with disposable polyethylene sleeves. Soil cores will be retrieved in four or five-foot sections, and can be easily cut from the polyethylene sleeves for observation and sampling. The macrocore sampler will be decontaminated between boring locations using an alconox and water solution.

Prior to initiating drilling activities, the Macrocores, drive rods, and pertinent equipment, will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used.

Test borings will be advanced with 2-inch (or larger) inside diameter (ID) direct push Macrocore through overburden soils. Drilling fluids, other than potable water will not be allowed without

special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

### 3.2.2.2 Hollow Stem Auger

The drilling and installation of monitoring wells will be performed using a rotary drill rig which will have sufficient capacity to perform 4 1/4-inch ID hollow-stem auger drilling in the overburden, retrieve Macrocore or split-spoon samples. Equipment sizes and diameters may vary based on project-specific criteria. Any investigative derived waste generated during the advancement of soil borings and monitoring well installations will be containerized and characterized for proper disposal.

Prior to initiating drilling activities, the augers, rods, Macrocore, split spoons, and other pertinent equipment will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Steam cleaning activities will be performed in a designated on-site decontamination area. During and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used.

Test borings will be advanced with 4 1/4-inch ID hollow stem augers through overburden, driven by truck-, track-, or trailer-mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for project specific criteria, but must be approved by the NYSDEC. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

Hollow stem auger advanced groundwater-monitoring wells typically utilize minimum 2-inch threaded flush joint PVC pipe with 0.010-in. slotted screen or pre-packed well screens. PVC piping used for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe. All materials used to construct the wells will be NSF / ASTM approved. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated wood cap or plastic plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well.

### 3.2.2.3 Subsurface Soil Sample Screening and Collection

When polyethylene sleeves or split spoons are removed from borings, the soil will immediately be observed for soil characteristics, including general soil type (sand, silt, clay), moisture, confining layers, and evidence of impairment (e.g. petroleum or chemical odors, staining, volatile organic vapors as measured by a PID – ex-situ and headspace). Generally, sample selection is based on evidence of impairment, depth, spatial distribution, or for delineation purposes. Normally, sample locations will not be known until the end of each day in the field. Therefore, samples for potential analysis will be placed in new Ziploc bags and placed on ice until they are placed into laboratory provided glassware.

When PFAS sampling / testing is required, no sampling equipment components or sample containers should come into contact with aluminum foil, LDPE, glass, or Teflon tape. Acceptable equipment includes stainless steel spoons and bowl, HDPE containers, and steel tools that are not coated.

### **3.2.3 Groundwater Monitoring Well Construction / Completion**

#### **3.2.3.1 Artificial Sand Pack**

When utilized, granular backfill will be chemically and texturally clean, inert, siliceous, and of appropriate grain size for the screen slot size and the host environment. The sand pack will be installed using a tremie pipe, when possible (i.e., a tremie pipe may not fit into smaller, 2-inch diameter boreholes). When utilized, the well screen and casing will be installed, and the sand pack placed around the screen and casing to a depth extending at least 2 feet above the top of the screen. A pre-packed well screen may be used if pre-approved by the NYSDEC.

#### **3.2.3.2 Bentonite Seal**

A minimum 2-foot thick seal will be placed directly on top of the sand pack, and care will be taken to avoid bridging. In the event that Site geology does not allow for a 2-foot seal (e.g., only 1-foot of space remains between the top of the sand pack and ground surface), the remaining space in the annulus will be filled with bentonite.

#### **3.2.3.3 Grout Mixture**

Upon completion of the bentonite seal, the well may be grouted with a 30% solids pure bentonite grout, a non-shrinking cement grout, a cement / bentonite grout mix, or a bentonite / soil mix as indicated in the Work Plan. The grout will be placed from the top of the bentonite seal to the ground surface.

#### **3.2.3.4 Surface Protection**

At all times during the progress of the work, precautions shall be used to prevent tampering with or the entrance of foreign material into the well. Upon completion of the well, a suitable cap shall be installed to prevent material from entering the well. Where permanent wells are to be installed, the well riser shall be protected by a flush mounted road box set into a concrete pad or locking well cap for stick-up wells. A concrete pad, sloped away from the well, shall be constructed around the flush mount road box or stick-up casing at ground level.

Any well that is to be temporarily removed from service or left incomplete due to delay in construction shall be capped with a watertight cap.

#### **3.2.3.5 Surveying**

Coordinates and elevations will be established for each monitoring well and sampling location. Elevations to the closest 0.01 foot shall be used for the survey. These elevations shall be referenced to a regional, local, or project-specific datum. The location, identification, coordinates, and elevations of the wells will be plotted on maps with a scale large enough to show their location with reference to other structures at each site.

### 3.2.3.6 Well Development

After completion of the well, but not sooner than 48 hours after grouting is completed, development will be accomplished using pumping, bailing, and / or surge blocking. No dispersing agents, acids, disinfectants, or other additives will be used during development or introduced into the well at any other time. During development, water will be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

Water elevations will be taken on all wells prior to development, purging, and sampling. All measurements will be taken within a 24-hour period to obtain consistent elevations and recorded on well data sheets. The procedure for measuring water levels in the monitoring wells is:

- Unlock and remove well cap;
- Test the atmosphere of the well with the calibrated PID. If the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the HASP;
- Measure water level to nearest 0.01 foot with a water level indicator (electronic);
- Water level indicators will be decontaminated before moving to next well. The tape and cable are decontaminated by washing in a bucket of distilled water-biodegradable phosphate free-detergent solution, followed by a rinse with distilled water.

Development water will either be properly contained and treated as waste until the results of chemical analysis of samples are obtained or discharged on Site as determined by the Site-specific work plans and/or consultation with the NYSDEC representatives on Site.

The development process will continue until removal of a minimum of 110% of the water lost during drilling, three well volumes; whichever is greater (or as specified in the Work Plan), and when water quality monitoring demonstrates stabilization of the effluent. The water quality meter will be calibrated prior to each sampling event (and more often as required by the manufacturer's data), using calibration fluids. Stabilization criteria is shown in the table below. In the event that limited recharge does not allow for the recovery of all drilling water lost in the well or three well volumes, the well will be allowed to stabilize to conditions deemed representative of groundwater conditions. Stabilization periods will vary by project but will be

confirmed with the NYSDEC prior to sampling.

**Table 3-2: Well Development Stabilization Criteria**

Parameter	Units	Stabilization Criteria
pH	Standard Units	± 0.1
Conductivity	mS/cm	± 3%
Turbidity	NTU	10% or < 10 NTU
D.O.	mg/L	10% or < 0.5 mg/L
Temperature	°F / °C	± 3%
ORP	mV	± 10

### 3.2.3.7 Groundwater Sample Collection

Groundwater samples will be collected using a dedicated low flow pump. When analysis is limited to VOCs, samples may be collected with disposable or stainless steel bailers. When PFAS sampling / testing is required, only the following equipment will be permitted:

- Stainless steel inertia pump with HDPE tubing
- Peristaltic pump with HDPE and silicone tubing
- Stainless steel bailer with stainless steel ball
- Bladder pump (identified as PFAS-free) with HDPE tubing

All sampling equipment will be properly decontaminated in the field (see **Section 3.3**). The following equipment will be available for sampling of monitoring wells in addition to the general sampling equipment list:

- Well Data Sheets
- Pump
- Electronic water level indicator
- Water Quality Meter
- Acid resistant gloves

The following activities will be completed before going into the field every day before the start of sampling:

- Fill out appropriate section on Well Data Sheet for the wells to be sampled;
- Obtain the sampling schedule for each well to be sampled;
- Calibrate the PID with the calibration gas;
- Determine the amount of sampling to be done for the day and prepare the necessary number of coolers;

- Each well to be sampled will have designated coolers containing the pre-labeled, certified clean, sample bottles. The groundwater samples will be placed in the cooler labeled for the well from which they were taken. The bottle shall be labeled with large distinguishable letters, so that the groundwater samples will be placed in the proper cooler; and
- Select the appropriate sample bottles for the day's sampling. The bottles shall be pre-marked with a sample parameter and preservatives. Reusable glass bottles will have been cleaned and prepared at the laboratory. The bottles for the various parameters to be analyzed from each well location will then be placed in a cooler.

The following steps describe the sample collection of groundwater:

- Unlock and remove the well cap;
- When VOCs are a contaminant of concern, test the air at the wellhead with the calibrated PID. If the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the HASP. Record the reading on the Well Data Sheet;
- In order to obtain a representative sample of the formation water, the well must be purged of the static water within the well. Prior to purging, the static water level within the well must be measured and the measurement recorded on the Well Data Sheet. To determine the amount of water necessary to purge, find the liquid column height in the well to determine the total volume (three liquid column borehole volumes) of liquid to be purged;
- Purge the well; lower pump slowly into the well until it is below the water surface. In accordance with the Work Plan, purge waters will either be disposed within the vicinity of the respective well or containerized.
- Record the amount of water purged in the field logbook and on the Well Data Sheet.
- If the well goes dry during pumping, allow for full recovery (measure the water level) and then sample. If recovery takes more than twenty minutes, proceed to next well but return to sample within 24 hours.
- Fill the appropriate sample bottles according to the sampling schedule for each well. While filling the sample bottles, record the well number, type, volume of container, and the preservatives used on the Ground Water Sampling Analyses form.
- The preservatives for the various sampling parameters were previously added to the clean sample bottles by the laboratory. Some parameters may require additional special handling.

- Volatile organics analyses sample vials must be free of air bubbles. When a bubble-free sample has been obtained, it must be immediately chilled.
- Collect the matrix spike duplicates, duplicates, field blanks, and trip blanks, as applicable. Take samples according to sampling schedule presented in the Work Plan.
- Record all pertinent information in field logbook and on the Well Data Sheet (include color, odor, sediment content of sample, etc.). Any situations at the site that have the potential to interfere with the analytical results should also be recorded here.
- Lock well, inspect well site, and note any maintenance required.
- Dispose of potentially contaminated materials in designated container.

### 3.2.4 Air Sample Collection

All activities will be conducted in accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, October 2006, and subsequent revisions.

#### 3.2.4.1 Soil Vapor Implant Installation

Semi-permanent soil vapor monitoring points will be installed using direct-push methods. Continuous soil sampling will be conducted at each location using Geoprobe® Systems' Macro-Core® soil samplers, to create a nominal 2.25-inch diameter borehole. The direct-push borings will be terminated at the target depth of the vapor implant placement. As consistent with NYSDOH guidance, the vapor implants will be positioned so as to allow collection of vapor samples at depths comparable to the depths of nearby foundation footings (normally +/- five feet in depth), or at least 12 inches above the water table, if groundwater is present at a depth less than six feet bgs. The groundwater depth will be determined based upon static water levels recorded in nearby wells.

Following creation of the borehole, the vapor implants will be placed at the target sampling depth. Each implant will consist of a six-inch long vapor implant with stainless steel mesh / screen. Polyethylene tubing will be affixed to the top of the stainless-steel screen and extended to the ground surface. The borehole annulus below, surrounding, and to twelve inches above the top of the screen will be filled with 00N sand or glass beads to create an inert, porous vapor sampling zone. The remainder of the borehole annulus will be filled with a bentonite slurry to minimize outdoor air from entering the sampling zone. Each vapor implant will be completed with a flush-mount protective casing.

Following installation, samples will be collected using a Summa™ canister (6-Liter capacity) equipped with a critical orifice flow regulation device sized to allow an air sample to be collected over a 24-hour sampling period.

### 3.2.4.2 Sub-Slab Soil Gas Sampling

Sub-slab sampling points will be installed to collect soil gas immediately below the slab. Sub-slab samples are typically co-located with corresponding indoor air samples to allow comparison of sub-slab and nearby indoor air concentrations. Sub-slab gas samples will be collected using a Summa™ canister (6-Liter capacity) equipped with a critical orifice flow regulation device sized to allow an air sample to be collected over a 24-hour sampling period.

The sub-slab vapor points will be installed by first advancing a small diameter hole (approximately 3/8-inches in diameter) through the floor slab to determine thickness. The holes will be drilled via a hammer drill or concrete core. The hole will extend through the slab and terminate at the interface with underlying material (i.e. gravel base or soil). A length of vinyl tubing will be placed into the hole to extend to the bottom of the slab. The cored slab annulus will be sealed with clay around the tubing.

To ensure there is no connection between the sub-slab and indoor air, helium short-circuit testing will be performed at each sampling point. The helium will be introduced into a dome placed over the sealed tubing. The dome will be sealed to the concrete floor with modeling clay. A helium meter that is capable to read down to 1-2% helium will be connected to the sample tubing to measure helium concentrations in the sub-slab environment. The detection of helium in the sub-slab air indicates communication between the air inside the dome and the sub-slab, revealing a leak in the seal around the tubing. If helium is detected in the sub-slab tubing at a concentration greater than 10% of the concentration of helium in the dome, the clay seal around the tubing will be reconfigured and the tracer test will be repeated until an adequate seal is observed.

Prior to sub-slab soil gas sample collection, the sample tubing will be purged at a rate not exceeding 200 mL/min to remove three tubing volumes of air. This ensures the concentrations detected in the sample are representative of soil gas and not diluted by indoor air.

### 3.2.4.3 Indoor Air Sampling

Indoor air samples will be collected using a Summa™ canister (6-Liter capacity) equipped with a critical orifice flow regulation device sized to allow an air sample to be collected over a 24-hour sampling period. The sampling canister will be placed approximately three to five feet off the ground.

A NYSDOH Indoor Air Quality Questionnaire and Building Inventory Form will be completed at the time of sampling (**Appendix B**). Testing will be conducted under the following conditions:

- Air samples will be collected during the heating season. In New York State, heating season generally extends from November 15 to March 31. However, in Upstate New York, it is common to heat buildings between October and April.

- Closed building conditions will begin at least 12 hours prior to the initiation of testing and shall be maintained throughout the test period, lasting less than four days.
- All exterior windows and doors shall be kept closed (except for momentary entry and exit by personnel). This includes areas not being tested.
- Heating and cooling systems shall be set to normal, occupied, operating temperatures; fan/blower controls shall be set to intermittent activity unless the system is designed to only run the fan continuously.
- Occupants should avoid excessive operation of clothes dryers, range hoods, bathroom fans, and other mechanical systems that draw air into and out of the building.
- Solid, liquid, or gas burning fireplaces shall not be operated unless they are the primary / normal sources of heat for the building.
- Window air-conditioning units shall only be operated in a re-circulating mode.
- Equipment that supplies fresh air to the building shall be deactivated unless it is an integral part of the HVAC system or supplies make-up air to a combustion appliance.
- Window fans shall be removed or sealed shut.
- Fans installed in attics to control only attic air and not whole-building temperature, or humidity may continue to operate.
- Normal operation of permanently installed ventilation systems such as energy recovery ventilators (also known as heat recovery ventilators or air-to-air heat exchangers) may continue during closed-building conditions so long as the system is regularly maintained and continuously operational.

Beginning 24 hours prior to test initiation and continuing throughout the duration of the test, the following activities will be avoided inside the building:

- Performing excavations or other activities that may generate particulate matter;
- Smoking;
- Painting;
- Cleaning, waxing, polishing furniture or floors with petroleum or oil-based products;
- Application of hairspray, nail polish, nail polish remover, perfume / cologne;

- Using air fresheners or odor eliminators; and
- Using any other products or performing any activities that contain VOCs, produce odors, or may otherwise influence indoor air testing results, or that are not consistent with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

#### 3.2.4.4 Ambient Air Sampling

Ambient air samples will be collected in the same manner as the indoor air samples. The outdoor air sample will be collected using a Summa™ canister (6-Liter capacity) equipped with a critical orifice flow regulation device sized to allow an air sample to be collected over a 24-hour sampling period. The sampling canister will be located upwind of the structure and will be placed approximately three to five feet off the ground.

#### 3.2.4.5 Sample Canister Deployment and Retrieval

For all soil vapor, sub-slab soil vapor, and indoor and outdoor air sampling described above, sample canisters will be deployed and retrieved as described below:

- Air sample canisters will be labeled with a unique sample designation number. The sample number and location will be recorded on the field log.
- The canister vacuum will be measured using an integrated vacuum gauge immediately prior to canister deployment and recorded on the field log. The critical orifice flow controller will be installed, as supplied by the laboratory, on the canister; the canister will be opened fully at the beginning of sample collection period; and the start time will be recorded.
- The canister vacuum will be measured and recorded immediately prior to canister retrieval at the end of the sample period. Once the vacuum is measured, the canister valve will be closed fully at the end of the sample period by disconnecting the regulator from the canister and the end time will be recorded.
- The canisters will be returned to their sampling boxes for safe storage and shipping. Field data will be verified as correctly entered into field books prior to shipment and the canisters will be shipped to the laboratory under a chain-of-custody.
- Each sample will be analyzed for VOCs via USEPA Compendium Method TO-15. Five indoor air compounds (trichloroethene, cis-1,2-dichloroethene, 1,1-dichloroethene, carbon tetrachloride, and vinyl chloride) will be analyzed using USEPA Method TO-15 Select Ion Monitoring (SIM) to achieve low level laboratory reporting limits of 0.20 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) or less.

### 3.3 General Decontamination

The following procedures will be performed for the decontamination of exploration equipment, sampling equipment, and personnel after each drilling/sampling event:

- Drill rig, backhoe, and excavator – The drill rig, direct-push rig, backhoe, and/or excavator will be cleaned prior to their entrance and exit of the site. Greases and oils will not be used on any down hole equipment during drilling or exploration activities.
- Exploration equipment – To avoid cross contamination, use of a PID meter and cleaning between each sampling site will be employed on backhoe arms, buckets, hollow stem augers, casing drill rods, down-hole tools, and appurtenant equipment.
- Split spoon sampler – The split spoon sampler will be scrubbed, cleaned, and put through a series of rinses between each sampling event. A number of split spoon samplers will be used so that one can be utilized for sampling while the others are being cleaned.
- Reusable equipment – The following steps will be employed to decontaminate reusable equipment:
  - Rinse equipment of soil or foreign material with potable water;
  - Immerse and scrub equipment with bio-degradable phosphate-free detergent and potable water;
  - Immerse and scrub in a potable water rinse without detergent;
  - Immerse and scrub in deionized/distilled water;
  - Saturate by spraying or immersion in laboratory-grade hexane;
  - Air dry and wrap cleaned equipment in foil to carry to next monitoring site to prevent contamination of equipment during transfer; and
  - The decontamination wash and rinse water will not be considered hazardous unless visual inspection or monitoring by the PID and other equipment indicate that contaminants may be present. The rinse waters can be discharged on-site if they are not contaminated. If contaminants are expected to be present, the rinsate waters should be placed in 55 gallon drums and stored on-site.
- Disposable equipment – The following steps will be employed to decontaminate disposable equipment:
  - Rinse with potable water;
  - Remove all standing liquid from the piece of equipment;
  - Dispose of the equipment in a dedicated container for contaminated solids; and
  - Dispose of rinse water in 55 gallon drums if contaminants are found to be present.
- Sample containers – Upon filling and capping sample bottles, the outside of the bottle will be wiped off with a clean paper towel. These towels will be disposed of in a dedicated container for contaminated solids.

- Personnel decontamination – The following procedures will be used to decontaminate sampling personnel.
  - After each sampling event chemical resistant gloves will be disposed of in a dedicated container for contaminated solids;
  - At the end of each sampling day, Tyvek™ coveralls will be disposed of in a dedicated container for contaminated solids;
  - Boots will be rinsed off with water to remove mud, clay, or any other contaminants; and
  - Personnel will be required to follow procedures outlined in the HASP.
  
- Special Considerations for PFAS – The following procedures will be used when sampling for PFAS.
  - Clothing that contains PTFE material, including Gore-Tex or that have been water-proofed with PFAS materials should be avoided. All clothing worn by sampling personnel should first be laundered multiple times. Acceptable rain gear includes PVC, polyurethane, or rubber. If such materials are required because site conditions warrant additional protection for samplers, their use will be documented in the field notes.
  - Decontamination water shall be verified in advance to be PFAS-free through laboratory analysis or certification. Previous results of non-detect for PFAS are acceptable.

## 4.0 SAMPLE MANAGEMENT PLAN

### 4.1 Sample Management

This Sample Management Plan provides procedures to document and track samples and results obtained during this work effort. A series of pre-printed forms with the appropriate information serves as a vehicle for documentation and tracking.

In order to accomplish this task, the documentation materials will include sample labels, sample characterization and Chain-of-Custody sheets, daily field reports, and a sample log.

- Sample Label – A sample label will be completed for each sample obtained and will be affixed to the sample container. The label is configured in a way to address various types of mediums. Information on the label includes, at a minimum, client name, location, sample description, sample number, date, time, grab sample, composite sample, notes, and sampler's name.
- Sample Characterization & Chain-of-Custody Sheet – All pertinent field information will be entered onto the sample characterization and chain-of-custody sheets including client name, sample ID, sample description, location of sample, sampling method, number of containers, container type, analysis required, and preservation. The monitoring well form has space allotted for entering information regarding the well including depth to water, well volume, sample pH, temperature, color, etc. The Chain-of-Custody section of the form will document the sample's pathway of sample shipment which will include names of persons delivering/receiving, dates, and times. The reverse side of this form will be used by the laboratory to document analysis performed on the sample. Copies of the completed forms will be retained by the Engineer and the analytical laboratory. The original sample characterization and Chain-of-Custody sheets will be submitted in the Remedial Investigation report along with the laboratory results.
- Daily Field Reports – Daily activities will be recorded on the Inspection Report form. The purpose of this form will be to summarize the work performed on the site each day. The completed forms will be submitted to the Project Manager on a daily basis for short term site activity and on a weekly basis for site activities of a longer duration.
- Sample Log – The sample log will be utilized to track each individual sample obtained at the site. The upper portion, "Field Identification" will be completed the day the sample is taken. The form will accompany the sample characterization and Chain-of-Custody form to the laboratory. Personnel at the laboratory will complete the middle section of this form and return it to the Engineer, who will use the document to track incoming results. The bottom of the sheet has space allocated to enter "Recommended Actions" based on laboratory results.

## 4.2 Sample Handling

Each collected sample will be dispensed into the appropriate sample containers for the type of analysis to be performed. Sampling staff will wear nitrile gloves at all times when handling samples. Appropriate sample preservatives will be added to the sample containers by the contracted analytical laboratory prior to the delivery into the field, except in cases where the sample preservative must be added after sample collection. All samples that require cool storage will be immediately placed in coolers with appropriate packaging materials so as to protect the breakage of sample containers during shipment. The sample coolers will be filled with cubed ice (no "Blue Ice") prior to leaving the sample collection location. In the instance that a local analytical laboratory is contracted, the samples will be hand delivered to the laboratory each sampling day. The chain-of-custody forms will be signed by the laboratory personnel picking up the samples and placed within the coolers. In the instance that an analytical laboratory is contracted which is not based locally and a common carrier is used for sample shipment, the chain-of-custody forms will be signed by the sampler and the carrier personnel and placed inside of the coolers. Careful packaging techniques will be used to prevent sample containers from breakage during shipment. Materials such as cardboard, foam wrap, or Styrofoam may be used as packaging materials. All samples will be delivered to the contracted analytical laboratory on the day they were collected and will be received by the laboratory within 24 hours of sample collection. The samples will be collected with sufficient time allowed at the end of the day for the analytical laboratory to properly process the sample chain-of-custody.

## **Appendices**

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## **Appendix A**

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### Supporting Documentation for PFAS Analysis



Department of  
Environmental  
Conservation

# SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

April 2023



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## ERRATA SHEET for

**SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES  
(PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020**

<b>Citation and Page Number</b>	<b>Current Text</b>	<b>Corrected Text</b>	<b>Date</b>
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Data Assessment and Application to Site Cleanup Page 3	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	Until such time as Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	3/28/2023
Water Sample Results Page 3	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below.	NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These guidance values also include criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt). Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and the presence of soil source areas, as defined below.	3/28/2023
Soil Sample Results Page 3	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values:	NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. Until SCOs are in effect, the following are to be used as guidance values:	3/28/2023
Protection of Groundwater Page 3	PFOA (ppb) 1.1 PFOS (ppb) 3.7	PFOA (ppb) 0.8 PFOS (ppb) 1.0	3/28/2023

Citation and Page Number	Current Text	Corrected Text	Date
Footnote 2 Page 3	The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document ( <a href="http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf">http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf</a> ).	The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 ( <a href="https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf">https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf</a> ). The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document ( <a href="http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf">http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf</a> ).	3/28/2023
Testing for Imported Soil Page 4	If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.	If the concentrations of PFOA and PFOS in leachate are at or above the ambient water quality guidance values for groundwater, then the soil is not acceptable.	3/28/2023
Routine Analysis, page 9	“However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101.”	“However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533.”	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	“In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.”	9/15/2020

<b>Citation and Page Number</b>	<b>Current Text</b>	<b>Corrected Text</b>	<b>Date</b>
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020
Water Sample Results Page 10	<p>PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (...)</p> <p>If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.</p>	<p>PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (...)</p> <p>If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.</p>	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
<p>Soil Sample Results, page 10</p>	<p>“The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase.”</p>	<p>“Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. “</p> <p>[Interim SCO Table]</p> <p>“PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.</p> <p>As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference:  <a href="https://www.nj.gov/dep/srp/guidance/rs/daf.pdf">https://www.nj.gov/dep/srp/guidance/rs/daf.pdf</a>. ”</p>	<p>9/15/2020</p>

Citation and Page Number	Current Text	Corrected Text	Date
<p>Testing for Imported Soil Page 11</p>	<p>Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs.</p> <p>If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State’s Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.</p>	<p>Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.</p> <p>PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.</p>	<p>9/15/2020</p>

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	<p><sup>1</sup> TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.</p> <p><sup>2</sup> The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (<a href="http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsupdoc.pdf">http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsupdoc.pdf</a>).</p>	9/15/2020
Additional Analysis, page 9	In cases... soil parameters, such as Total Organic Carbon (EPA Method 9060), soil...	In cases... soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil...	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021
Water Sample Results Page 9	<p>“In addition, further assessment of water may be warranted if either of the following screening levels are met:</p> <p>a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or</p> <p>b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L”</p>	Deleted	6/15/2021

Citation and Page Number	Current Text	Corrected Text	Date
Routine Analysis, Page XX	Currently, New York State Department of Health’s Environmental Laboratory Approval Program (ELAP)... criteria set forth in the DER’s laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids).	Deleted	5/31/2022
Analysis and Reporting, Page XX	As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.	Deleted	5/31/2022
Routine Analysis, Page XX	LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media.	EPA Method 1633 is the procedure to use for environmental samples.	
Soil Sample Results, Page XX	Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6	
Appendix A	“Include in the text... LC-MS/MS for PFAS using methodologies based on EPA Method 537.1”	“Include in the text ....EPA Method 1633”	
Appendix A	“Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101”	Deleted	
Appendix B	“Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1”	“Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633”	

Citation and Page Number	Current Text	Corrected Text	Date
Appendix C	“Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1”	“Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633”	
Appendix D	“Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1”	“Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633”	
Appendix G		Updated to include all forty PFAS analytes in EPA Method 533	
Appendix H		Deleted	
Appendix I	Appendix I	Appendix H	
Appendix H	“These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report.”	“These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER).”	
Appendix H	“The holding time is 14 days...”	“The holding time is 28 days...”	
Appendix H, Initial Calibration	“The initial calibration should contain a minimum of five standards for linear fit...”	“The initial calibration should contain a minimum of six standards for linear fit...”	
Appendix H, Initial Calibration	Linear fit calibration curves should have an R <sup>2</sup> value greater than 0.990.	Deleted	
Appendix H, Initial Calibration Verification	Initial Calibration Verification Section	Deleted	
Appendix H	secondary Ion Monitoring Section	Deleted	
Appendix H	Branched and Linear Isomers Section	Deleted	

# Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

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## Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

## Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

## Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments, or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

## Analysis and Reporting

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third-party data validator. Electronic data submissions should meet the requirements provided at: <https://www.dec.ny.gov/chemical/62440.html>.

DER has developed a *PFAS Analyte List* (Appendix G) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

### Routine Analysis

EPA Method 1633 is the procedure to use for environmental samples. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist. Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

### Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.<sup>1</sup>

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<sup>1</sup> TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

## Data Assessment and Application to Site Cleanup

Until such time as Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

### Water Sample Results

NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These human health criteria should also be applied to surface water that is used as a water supply. This guidance also includes criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt). Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and the presence of soil source areas, as defined below.

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

### Soil Sample Results

NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. Until SCOs are in effect, the following are to be used as guidance values:

<b>Guidance Values for Anticipated Site Use</b>	<b>PFOA (ppb)</b>	<b>PFOS (ppb)</b>
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater <sup>2</sup>	0.8	1.0

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These

<sup>2</sup> The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 ([https://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/part375techsupport.pdf](https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf)). The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document ([http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/techsuppdoc.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf)).

additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference:  
<https://www.nj.gov/dep/srp/guidance/rs/daf.pdf>.

## Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above the ambient water quality guidance values for groundwater, then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

## Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

### General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
  - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an “Analytical Methods/Quality Assurance Summary Table” specifying:
  - Matrix type
  - Number or frequency of samples to be collected per matrix
  - Number of field and trip blanks per matrix
  - Analytical parameters to be measured per matrix
  - Analytical methods to be used per matrix with minimum reporting limits
  - Number and type of matrix spike and matrix spike duplicate samples to be collected
  - Number and type of duplicate samples to be collected
  - Sample preservation to be used per analytical method and sample matrix
  - Sample container volume and type to be used per analytical method and sample matrix
  - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

### Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by EPA Method 1633
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
  - Reporting Limits should be less than or equal to:
    - Aqueous – 2 ng/L (ppt)
    - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- 
- Include detailed sampling procedures
  - Precautions to be taken
  - Pump and equipment types
  - Decontamination procedures
  - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

## Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

### General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 ([http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/sgpsect5.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf)), with the following limitations.

### Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

### Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

### Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

### Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

## Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

## Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at  $4 \pm 2^\circ$  Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

## Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

## Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

## Appendix C - Sampling Protocols for PFAS in Monitoring Wells

### General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 ([http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/sgpsect5.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf)), with the following limitations.

### Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

### Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

### Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

### Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

## Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

## Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at  $4 \pm 2^\circ$  Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

## Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

## Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

## Appendix D - Sampling Protocols for PFAS in Surface Water

### General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 ([http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/sgpsect5.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf)), with the following limitations.

### Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

### Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

### Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

### Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

### Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

## Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at  $4 \pm 2^\circ$  Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

## Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

## Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

## Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

### General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 ([http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/sgpsect5.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf)), with the following limitations.

### Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

### Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

### Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

### Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

### Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

## Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at  $4 \pm 2^\circ$  Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

## Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

## Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

## Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the current SOP developed by the Division of Fish and Wildlife (DFW) entitled “General Fish Handling Procedures for Contaminant Analysis” (Ver. 8). This SOP should be followed when collecting fish for contaminant analysis. Note, however, that the Bureau of Ecosystem Health will not be supplying bags or tags. All supplies are the responsibility of the collector

**Procedure Name:** General Fish Handling Procedures for Contaminant Analysis

**Number:** FW-005

**Purpose:** This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

**Organization:** Environmental Monitoring Section  
Bureau of Ecosystem Health  
Division of Fish and Wildlife (DFW)  
New York State Department of Environmental Conservation (NYSDEC)  
625 Broadway  
Albany, New York 12233-4756

**Version:** 8

**Previous Version Date:** 21 March 2018

**Summary of Changes to this Version:** Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

**Originator or Revised by:** Wayne Richter, Jesse Becker

**Date:** 26 April 2019

**Quality Assurance Officer and Approval Date:** Jesse Becker, 26 April 2019

**NEW YORK STATE  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

**GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES**

- A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:
1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).
  2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.
  3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.
- B. The following data are required on each **Fish Collection Record** form:
1. Project and Site Name.
  2. DEC Region.
  3. All personnel (and affiliation) involved in the collection.
  4. Method of collection (gill net, hook and line, etc.)
  5. Preservation Method.
- C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:
1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.
  2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.
  3. Date collected.
  4. Sample location (waterway and nearest prominent identifiable landmark).
  5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.
  2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.
  3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.
  4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate "Age" column.
  5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.
  6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.
  7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.
- E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish's tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

- F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.
- G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.
- H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:
- No materials containing Teflon.
  - No Post-it notes.
  - No ice packs; only water ice or dry ice.
  - Any gloves worn must be powder free nitrile.
  - No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
  - No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
  - Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
  - Wash hands after handling any food containers or packages as these may contain PFCs.
    - Keep pre-wrapped food containers and wrappers isolated from fish handling.
  - Wear clothing washed at least six times since purchase.
  - Wear clothing washed without fabric softener.
  - Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.
- I. All fish must be kept at a temperature  $<45^{\circ}\text{F}$  ( $<8^{\circ}\text{C}$ ) immediately following data processing. As soon as possible, freeze at  $-20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.
- J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.
- K. A recommended equipment list is at the end of this document.



**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
CHAIN OF CUSTODY**

I, \_\_\_\_\_, of \_\_\_\_\_ collected the  
(Print Name) (Print Business Address)

following on \_\_\_\_\_, 20\_\_\_\_ from \_\_\_\_\_  
(Date) (Water Body)

in the vicinity of \_\_\_\_\_  
(Landmark, Village, Road, etc.)

Town of \_\_\_\_\_, in \_\_\_\_\_ County.

Item(s) \_\_\_\_\_

\_\_\_\_\_

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_ Signature \_\_\_\_\_ Date

I, \_\_\_\_\_, received the above mentioned sample(s) on the date specified and assigned identification number(s) \_\_\_\_\_ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

\_\_\_\_\_ Signature \_\_\_\_\_ Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

## **NOTICE OF WARRANTY**

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

## **HANDLING INSTRUCTIONS**

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

## EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelopes, approximately 2" x 3.5", if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

## Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonic acids	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluoropentanesulfonic acid	PFPeS	2706-91-4
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorononanesulfonic acid	PFNS	68259-12-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
	Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUnA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTeDA	376-06-7
Per- and Polyfluoroether carboxylic acids	Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
	4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
	Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
	Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6
Fluorotelomer sulfonic acids	4:2 Fluorotelomer sulfonic acid	4:2-FTS	757124-72-4
	6:2 Fluorotelomer sulfonic acid	6:2-FTS	27619-97-2
	8:2 Fluorotelomer sulfonic acid	8:2-FTS	39108-34-4
Fluorotelomer carboxylic acids	3:3 Fluorotelomer carboxylic acid	3:3 FTCA	356-02-5
	5:3 Fluorotelomer carboxylic acid	5:3 FTCA	914637-49-3
	7:3 Fluorotelomer carboxylic acid	7:3 FTCA	812-70-4
Perfluorooctane sulfonamides	Perfluorooctane sulfonamide	PFOSA	754-91-6
	N-methylperfluorooctane sulfonamide	NMeFOSA	31506-32-8
	N-ethylperfluorooctane sulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids	N-methylperfluorooctane sulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethylperfluorooctane sulfonamidoacetic acid	N-EtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanols	N-methylperfluorooctane sulfonamidoethanol	MeFOSE	24448-09-7
	N-ethylperfluorooctane sulfonamidoethanol	EtFOSE	1691-99-2

Group	Chemical Name	Abbreviation	CAS Number
Ether sulfonic acids	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)	9Cl-PF3ONS	756426-58-1
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	11Cl-PF3OUdS	763051-92-9
	Perfluoro(2-ethoxyethane) sulfonic acid	PFEESA	113507-82-7

## Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

### General

These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER). Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory’s Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER’s Quality Assurance Officer, Dana Barbarossa, at [dana.barbarossa@dec.ny.gov](mailto:dana.barbarossa@dec.ny.gov).

### Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 28 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6°C upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

\*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

### Initial Calibration

The initial calibration should contain a minimum of six standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
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### Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results
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## Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

## Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample
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## Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects
--	--

## Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

## Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

## Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

## Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

## Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

## **Appendix B**

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# NYSDOH Indoor Air Quality Questionnaire and Building Inventory Form

**NEW YORK STATE DEPARTMENT OF HEALTH  
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY  
CENTER FOR ENVIRONMENTAL HEALTH**

This form must be completed for each residence involved in indoor air testing.

Preparer's Name \_\_\_\_\_ Date/Time Prepared \_\_\_\_\_

Preparer's Affiliation \_\_\_\_\_ Phone No. \_\_\_\_\_

Purpose of Investigation \_\_\_\_\_

**1. OCCUPANT:**

**Interviewed:** Y / N

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Address: \_\_\_\_\_

County: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Office Phone: \_\_\_\_\_

Number of Occupants/persons at this location \_\_\_\_\_ Age of Occupants \_\_\_\_\_

**2. OWNER OR LANDLORD:** (Check if same as occupant \_\_\_ )

**Interviewed:** Y / N

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Address: \_\_\_\_\_

County: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Office Phone: \_\_\_\_\_

**3. BUILDING CHARACTERISTICS**

**Type of Building:** (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

**If the property is residential, type?** (Circle appropriate response)

- |              |                 |                   |
|--------------|-----------------|-------------------|
| Ranch        | 2-Family        | 3-Family          |
| Raised Ranch | Split Level     | Colonial          |
| Cape Cod     | Contemporary    | Mobile Home       |
| Duplex       | Apartment House | Townhouses/Condos |
| Modular      | Log Home        | Other: _____      |

**If multiple units, how many?** \_\_\_\_\_

**If the property is commercial, type?**

Business Type(s) \_\_\_\_\_

Does it include residences (i.e., multi-use)? Y / N      If yes, how many? \_\_\_\_\_

**Other characteristics:**

Number of floors \_\_\_\_\_      Building age \_\_\_\_\_

Is the building insulated? Y / N      How air tight? Tight / Average / Not Tight

**4. AIRFLOW**

**Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:**

Airflow between floors

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Airflow near source

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Outdoor air infiltration

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Infiltration into air ducts

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**5. BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

- a. Above grade construction: wood frame concrete stone brick
- b. Basement type: full crawlspace slab other \_\_\_\_\_
- c. Basement floor: concrete dirt stone other \_\_\_\_\_
- d. Basement floor: uncovered covered covered with \_\_\_\_\_
- e. Concrete floor: unsealed sealed sealed with \_\_\_\_\_
- f. Foundation walls: poured block stone other \_\_\_\_\_
- g. Foundation walls: unsealed sealed sealed with \_\_\_\_\_
- h. The basement is: wet damp dry moldy
- i. The basement is: finished unfinished partially finished
- j. Sump present? Y / N
- k. Water in sump? Y / N / not applicable

**Basement/Lowest level depth below grade:** \_\_\_\_\_(feet)

**Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)**

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**6. HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

**Type of heating system(s) used in this building: (circle all that apply – note primary)**

- Hot air circulation
- Space Heaters
- Electric baseboard
- Heat pump
- Stream radiation
- Wood stove
- Hot water baseboard
- Radiant floor
- Outdoor wood boiler
- Other \_\_\_\_\_

**The primary type of fuel used is:**

- Natural Gas
- Electric
- Wood
- Fuel Oil
- Propane
- Coal
- Kerosene
- Solar

**Domestic hot water tank fueled by:** \_\_\_\_\_

**Boiler/furnace located in:** Basement Outdoors Main Floor Other \_\_\_\_\_

**Air conditioning:** Central Air Window units Open Windows None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

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**7. OCCUPANCY**

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

**Level** General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)

Basement	_____
1 <sup>st</sup> Floor	_____
2 <sup>nd</sup> Floor	_____
3 <sup>rd</sup> Floor	_____
4 <sup>th</sup> Floor	_____

**8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY**

- a. Is there an attached garage? Y / N
- b. Does the garage have a separate heating unit? Y / N / NA
- c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA  
Please specify \_\_\_\_\_
- d. Has the building ever had a fire? Y / N When? \_\_\_\_\_
- e. Is a kerosene or unvented gas space heater present? Y / N Where? \_\_\_\_\_
- f. Is there a workshop or hobby/craft area? Y / N Where & Type? \_\_\_\_\_
- g. Is there smoking in the building? Y / N How frequently? \_\_\_\_\_
- h. Have cleaning products been used recently? Y / N When & Type? \_\_\_\_\_
- i. Have cosmetic products been used recently? Y / N When & Type? \_\_\_\_\_

- j. Has painting/staining been done in the last 6 months? Y / N Where & When? \_\_\_\_\_
- k. Is there new carpet, drapes or other textiles? Y / N Where & When? \_\_\_\_\_
- l. Have air fresheners been used recently? Y / N When & Type? \_\_\_\_\_
- m. Is there a kitchen exhaust fan? Y / N If yes, where vented? \_\_\_\_\_
- n. Is there a bathroom exhaust fan? Y / N If yes, where vented? \_\_\_\_\_
- o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N
- p. Has there been a pesticide application? Y / N When & Type? \_\_\_\_\_

**Are there odors in the building?** Y / N  
 If yes, please describe: \_\_\_\_\_

**Do any of the building occupants use solvents at work?** Y / N  
 (e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist)

If yes, what types of solvents are used? \_\_\_\_\_

If yes, are their clothes washed at work? Y / N

**Do any of the building occupants regularly use or work at a dry-cleaning service?** (Circle appropriate response)

- Yes, use dry-cleaning regularly (weekly) No
- Yes, use dry-cleaning infrequently (monthly or less) Unknown
- Yes, work at a dry-cleaning service

**Is there a radon mitigation system for the building/structure?** Y / N Date of Installation: \_\_\_\_\_  
**Is the system active or passive?** Active/Passive

**9. WATER AND SEWAGE**

**Water Supply:** Public Water Drilled Well Driven Well Dug Well Other: \_\_\_\_\_  
**Sewage Disposal:** Public Sewer Septic Tank Leach Field Dry Well Other: \_\_\_\_\_

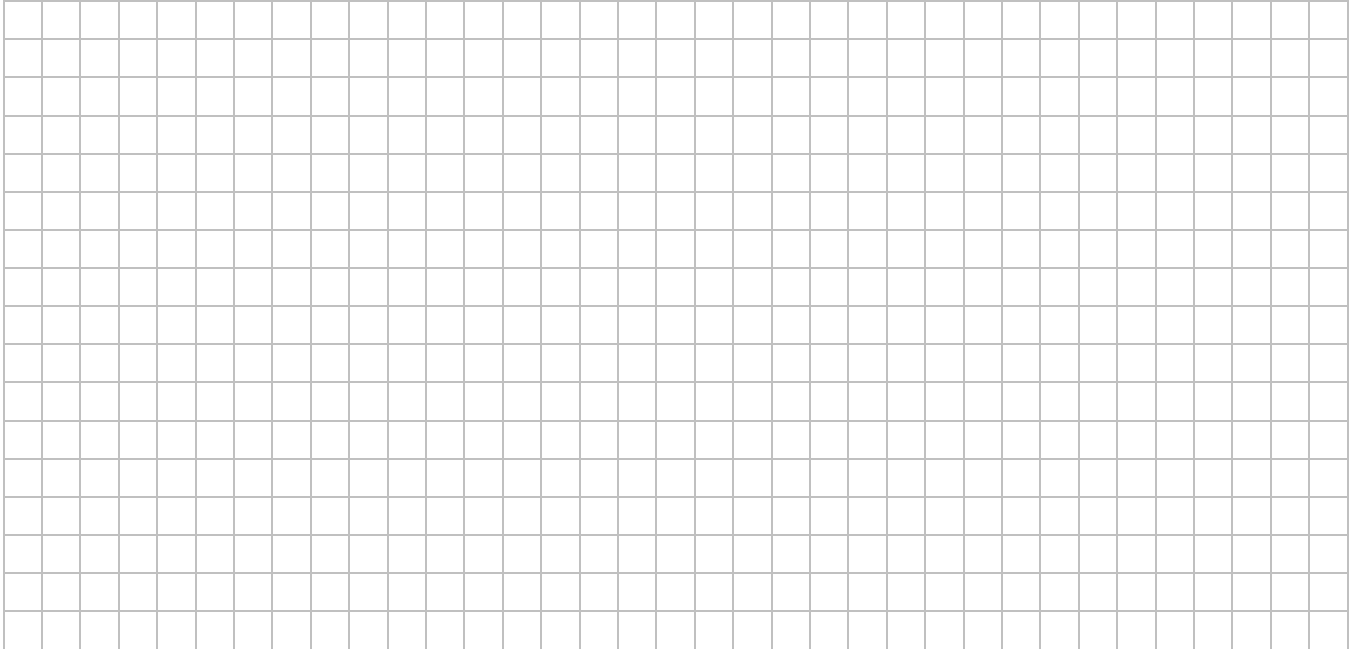
**10. RELOCATION INFORMATION (for oil spill residential emergency)**

- a. Provide reasons why relocation is recommended: \_\_\_\_\_
- b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel
- c. Responsibility for costs associated with reimbursement explained? Y / N
- d. Relocation package provided and explained to residents? Y / N

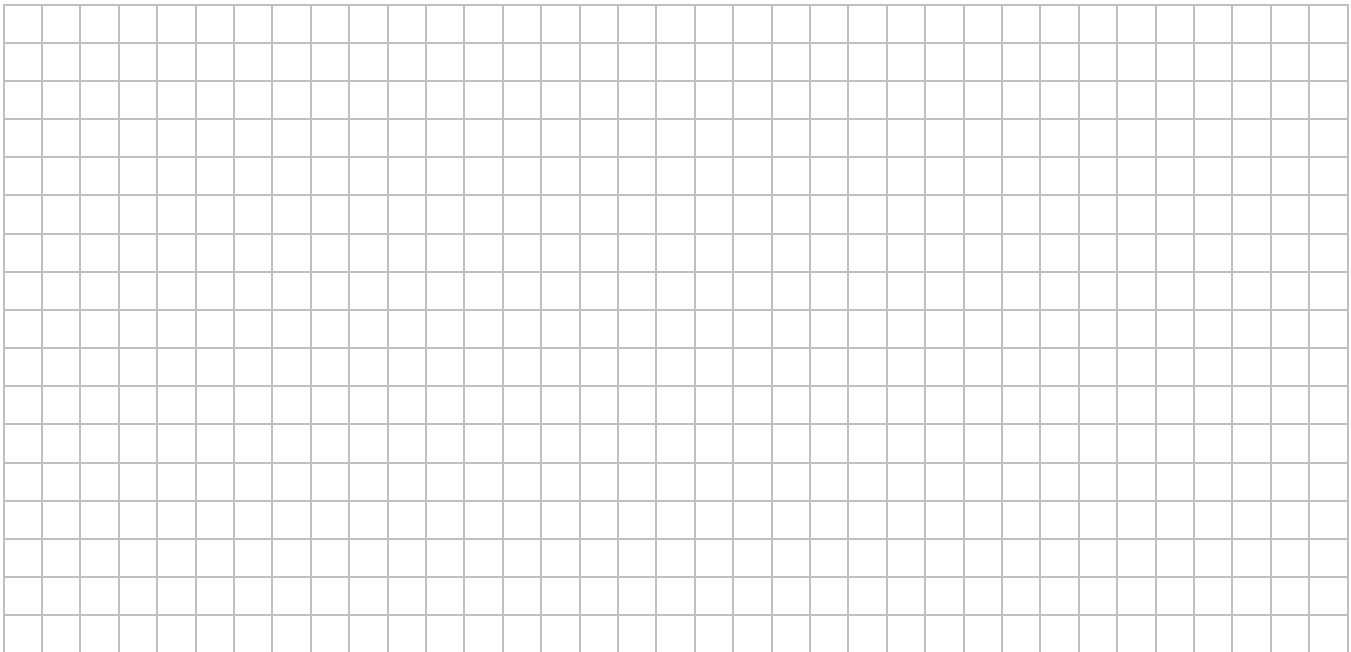
**11. FLOOR PLANS**

**Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.**

**Basement:**



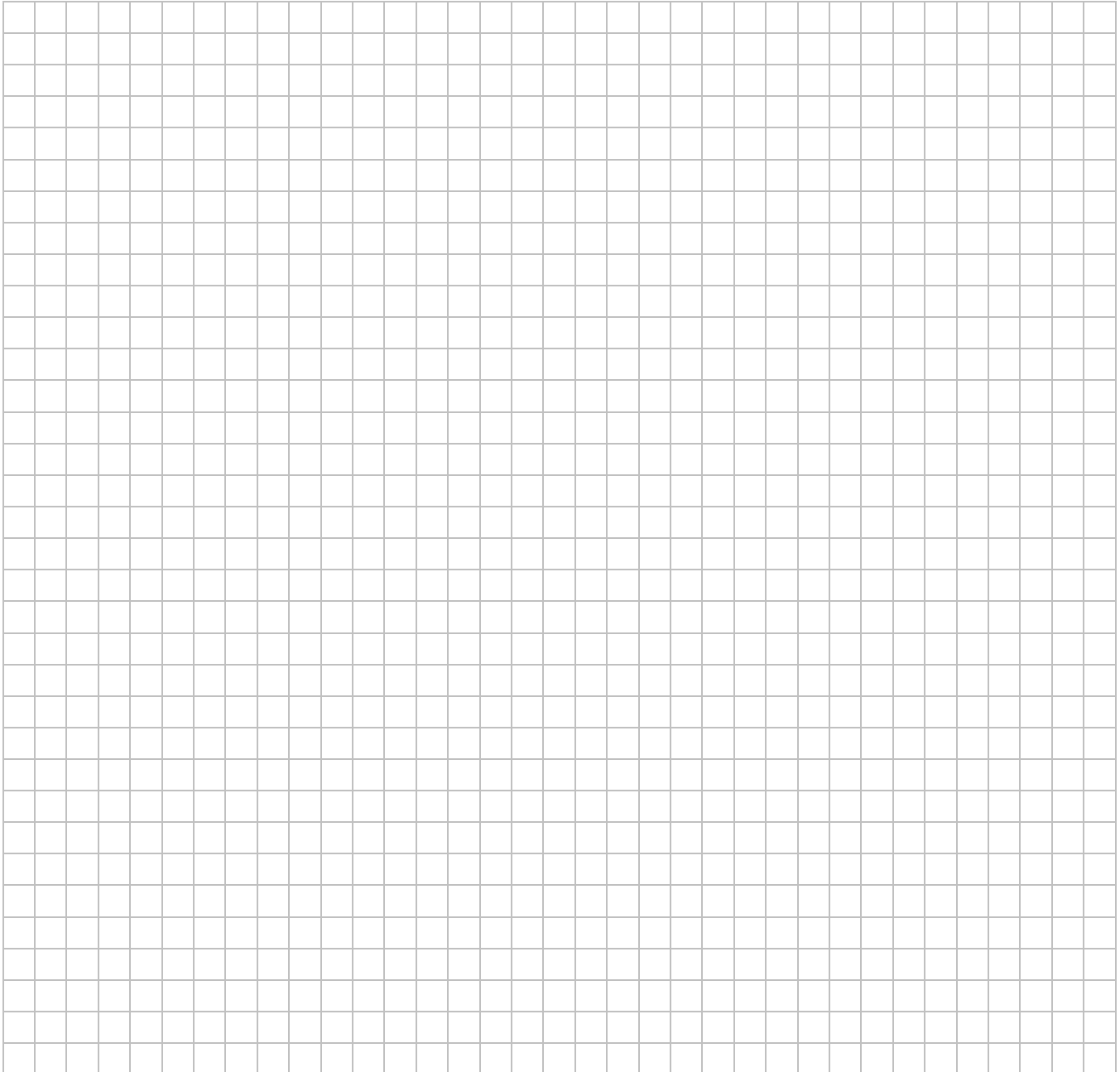
**First Floor:**



**12. OUTDOOR PLOT**

**Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.**

**Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.**

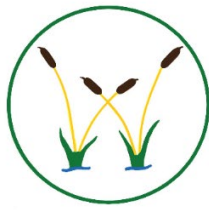




## **Appendix F**

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### Wetland Determination



December 3, 2025

**Kevin B. Kirk, R.A.**

Director of Planning & Design  
Uniland Development Company  
100 Corporate Pkwy | Suite 500  
Amherst, NY 14226

*Subject: Wetland Determination of the 1000 Bailey Avenue Parcel, 7.65± Acres. City of Buffalo, Erie County, NY*

Dear Mr. Kirk:

Wilson Environmental Technologies, Inc. (WET), acting on your behalf as our client, conducted a Wetland Determination (WD) for the purpose of determining whether wetlands subject to Federal or State jurisdiction under Section 404 of the Clean Water Act (U.S. Army Corps of Engineers (USACE)) and/or Article 24 of the New York State Department of Environmental Conservation Freshwater Wetland Regulations (NYSDEC) are present on the subject parcel. The WD consist of approximately 7.65 acres of highly disturbed industrial land located west of adjacent to Bailey Avenue (Figure 1). Based on the site investigation conducted on November 7, 2025 it was determined that no Federal or State Regulated Wetlands exist within the subject parcel. My conclusion is based on the site investigation in addition to various resource sources.

**RESOURCE MATERIAL REVIEWED**

A review of the National Wetlands Inventory Map shows single mapped wetland located within the limits of the parcel (Figure 2). No New York State Department of Environmental Conservation Freshwater Wetlands with the exception of the "Informational Wetlands" are mapped within the limits of the expansion parcel (Figure 3). These resource maps are intended to be used as planning aids and are subject to inaccuracies. Figure 4 represents the soils as mapped by the Natural Resources Conservation Service (NRCS) across the parcel. The soils represented on the site are mapped as Urban Land and Urban Land – Niagara Complex.

"Urban land" is a soil series that describes heavily modified or built-over areas, not a single type of soil. These soils have altered properties due to construction, with characteristics like compacted layers, fill material, and a high percentage of impervious surfaces and other disturbances such as pavement.

Urban Land – Niagara complex is best defined as Niagara silt loam and other soils types which are again highly disturbed. Niagara is listed as a somewhat poorly drained soil. Somewhat poorly drained soils can contain hydric inclusion. It is poorly drained soils that are typically associated with wetland areas. Poorly drained soils were not found within the parcel.

**CURRENT FEDERAL REGULATIONS**

As part of Section 404 of the Clean Water Act, the USACE regulates Federal wetland areas as small as 1/10 acres in size. WET conducted the PWD in accordance with the Corps of Engineers Wetland Delineation Manual dated January 1987 and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast

*Subject: Wetland Determination of the 1000 Bailey Avenue Parcel, 7.65± Acres. City of Buffalo, Erie County, NY*

*Region*, dated January 2012. This manual specifies methods accepted by the U.S. Army Corps of Engineers for its permitting process under Section 404 of the Clean Water Act and Section 10 of the River and Harbors Act of 1899. The Code of Federal Regulations defines a wetland as an area having hydric soils, wetland hydrology and supporting vegetation dominated by hydrophytes. All three of these criteria must be present for an area to qualify as a wetland. Hydrophytic vegetation has been defined as; species which due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, and/ or reproduce in persisting anaerobic soil conditions. These species have been given an indicator status defining their probability of occurring in a wetland. These indicator statuses are defined as Obligate Wetland (OBL), Facultative Wetland (FACW), and Facultative (FAC). Non-hydrophytic species are assigned an indicator status of Facultative Upland (FACU) or Obligate Upland (UPL).

## CURRENT STATE REGULATIONS

In 2024, NYSDEC finalized revisions to its Freshwater Wetlands regulations (6 NYCRR Part 664) under Article 24 of the Environmental Conservation Law, which took effect on January 1, 2025. These changes have the potential for significantly expanding the DEC's regulatory jurisdiction over freshwater wetlands in New York, including those not previously mapped or regulated. The changes primarily focus on defining and regulating "Wetlands of Unusual Importance" and clarifying the jurisdictional determination process. Wetlands of "**Unusual Importance**" that meet any of the **eleven specific criteria** listed below, regardless of size have the potential of being regulated if it meets at least one of these criteria:

- Located within a watershed prone to flooding.
- **Situated within or adjacent to an urban area as defined by the 2020 U.S Census Bureau Map.**
- Contains a rare plant species.
- Provides critical habitat for endangered, threatened, special concern species, or species of greatest conservation need.
- Classified by the DEC as a Class I wetland.
- Previously classified as a wetland of "unusual local importance".
- Is a vernal pool known for amphibian breeding.
- Located within a FEMA-designated floodway.
- Previously mapped by the DEC before December 31, 2024.
- Has locally or regionally significant wetland functions and values.
- Deemed significantly important by the Commissioner for protecting state water quality.

**This site wetland fails to meet any of the eleven criteria.**

The default size threshold for regulated wetlands is currently **12.4 acres** but will decrease to **7.4 acres** on January 1, 2028. Wetlands meeting "Unusual Importance" criteria are regulated regardless of these thresholds. The new regulations also allow for regulation of previously unmapped wetlands based on field observations and data.

## SITE CONDITIONS/METHODS

The area of investigation consisted of 7.65± acres. The area is located within an industrial rail yard area consisting of numerous rail tracks and the associated fill disturbances which typically accompany that activity. This yard is referred to as the SK Yard as a current reference shown on the Erie County Interactive Web Site. The parcel fronts along Bailey Avenue. The parcel is elevated above the Road by approximately 10 feet. The wetland study area is bounded to the west by an existing rail track, William Street to the north, and a commercial building to the south. The investigation area was entered from Baily Avenue via an existing access road. An area of dense common reed grass is the area shown as a PEM5Ex on the NWI Mapper as well as the NYSDEC Resource Mapper as an "Informational Wetland". The balance of the site consists of a meadow/shrubland vegetation communities. The landscape in the area of the study is relatively flat, with the exception of areas showing fill material/excavated /disturbed with a general slope of 0-3 percent slope. Four (4) data points were collected within the parcel (Figure 5) which represents typical

**Subject:** Wetland Determination of the 1000 Bailey Avenue Parcel, 7.65± Acres. City of Buffalo, Erie County, NY

habitat throughout the parcel. The site was walked and data collected by a Professional Wetland Scientist at the time of the site investigation. The area of investigation covered the entire 7.65 acre parcel.

The parcel consists predominantly of a mix of old field meadow and shrubland vegetation communities. Scattered trees were noted as eastern cottonwood (*Populus deltoides*, FAC) and ash leaf maple (*Acer negundo*, FAC). Scattered honeysuckle (*Lonicera tartarica*, FACU) and gray dogwood (*Cornus racemosa*, FAC) were the only species in shrub stratum. Dominant species in the herbaceous stratum was common reed grass (*Phragmites australis*, FACW), and mugwort (*Artemisia vulgaris*, FACU) common strawberry (*Fragaria virginiana*, FACU), Canada goldenrod (*Solidago canadensis*, FACU) rough goldenrod (*Solidago rugosa*, FAC), common cinquefoil (*Potentilla simplex*, FACU), white avens (*Geum canadense*, FACU) and other upland species.

An area of dense common reed grass is the area shown as a PEM5Ex wetland; Palustrine (**P**); Emergent (**EM**); **5** (*Phragmites australis*); **E** (Seasonally saturated); **x** (Special Modifier Excavated). Both the Subclass **5** and Special Modifier **x** are typically associated with highly disturbed areas including basins or channels that were excavated by humans. These areas would not exist in nature if not for the fact the area was excavated. As such, it may pond water in the spring of the year (seasonally). No water was observed at the time of the site investigation.

Soil samples and hydrology information was collected at random point throughout the parcel but concentrated in the area shown to be wetland on the Resource Mapper. Soil samples are typically obtained through the use of a stainless-steel drain spade or hand auger when possible, however, in most areas, including the excavated barrow area samples were unobtainable due to debris (railroad ties/ rock material/ tires and other fill/discarded material). Typically, the soil pits were examined to depths of at least 16 inches. The soil samples were inspected for the presence of hydric soil indicators; introduced in the 2012, *Regional Supplement Manual*. The presence of one or more indicators would identify the soil as hydric, while the absence of any indicators would conclude that the soil is non-hydric. Hydrology information was visually assessed during the soils investigation and included, but was not limited to, observations of inundation, soil saturation, water marks on trees, drainage patterns, drift lines, water-stained leaves, and oxidized rhizospheres on living roots.



Photo viewing south from the north portion of the site and the access road. Typical upland meadow vegetation in this area.



Photo in the vicinity of sample point U1 showing dense growth of *Phragmites australis* within the barrow pit.

*Subject: Wetland Determination of the 1000 Bailey Avenue Parcel, 7.65± Acres. City of Buffalo, Erie County, NY*

## CONCLUSION

Based on the results of our wetland investigation it is my professional opinion that **NO** wetlands, streams or other jurisdictional “waters of the United States” exist within the subject parcel. The parcel consisting of approximately 7.65 acres of disturbed meadow and industrial area. The use of this property as an active railroad transfer and transport site has led to significant disturbance to the soils and vegetation of the site. The area which is referred to as the **PEM5Ex** wetland is the direct result of man-made influences (past excavation). Being a man-made feature the area is not regulated under the current Water of the United State regulations as regulated by the USACE as it does not have a continuous connections to a regulated stream of navigable water. The vegetation that dominates the barrow area is common reed grass, which is listed as an Invasive Species by NYSDEC. This plant is aggressive and out competes native wetland plants which are beneficial to wildlife. Mugwort is also an aggressive plant which does well on disturbed soil sites and soils with poor nutrient content. Both these species are the dominant herbaceous species within the meadow community. Past involvement in similar situations has shown the even though the area is shown on the NYSDEC Resource Mapper as an “Informational Wetland” the site would not be regulated by the agency as an Article 24 Wetland of "Unusual Importance". **Based on the above, it is my Professional Opinion that *this site lacks the necessary criteria which defines an area as a Federal or State wetland.***

This report represents the conclusions of Wilson Environmental Technologies, Inc., based on existing site conditions. The results of this report are considered accurate to the best of our ability. WET represents this report based on the on-site investigation conducted on November 7, 2025. Based on this report it is our professional opinion this WD proves **NO** Section 404 or Article 24 Permits would be needed for the development of this project within this site.

Sincerely,

*Donald Wilson*

Donald G. Wilson  
Professional Wetland Scientist  
President  
Encls.

*Subject: Wetland Determination of the 1000 Bailey Avenue Parcel, 7.65± Acres. City of Buffalo, Erie County, NY*



Photo viewing west showing access road to site. Note grade coming into the site off of Bailey Avenue.



Photo view north from south end of site along Bailey Avenue.



Photo viewing south in the vicinity of Data Point U3.



Photo showing typical area of dumping on the parcel.

*Subject: Wetland Determination of the 1000 Bailey Avenue Parcel, 7.65± Acres. City of Buffalo, Erie County, NY*



**Photo viewing typical area of fill/disturbance within the parcel.**



**Photo viewing south with side-by-side track and upland old field meadow vegetation community.**



**Photo viewing typical area of fill/disturbance within the parcel.**



**Photo showing typical area of dumping on the parcel.**

*Subject: Wetland Determination of the 1000 Bailey Avenue Parcel, 7.65± Acres. City of Buffalo, Erie County, NY*



**Photo viewing south in the vicinity of Data Point U4.**



**Photo viewing east from the south west limit of the investigation area.**



**Photo viewing east typical upland area within the parcel in the vicinity of the south limits of the investigation area.**

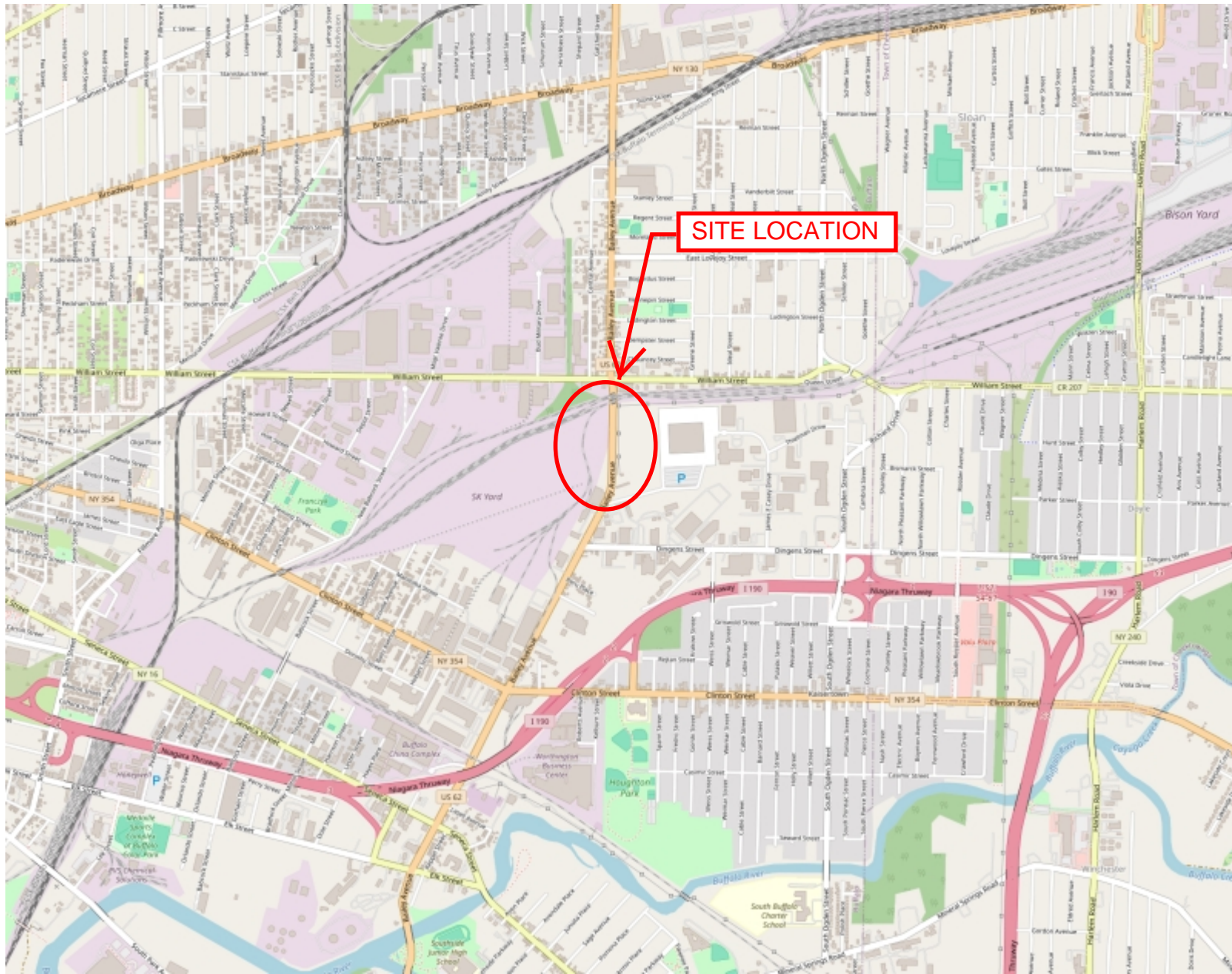


**Photo viewing west along Bailey Avenue and the south limit of the parcel.**



# Erie County On-Line Mapping Application

## Figure 1. Site Location - 1000 Bailey Ave, Buffalo NY



### Legend



0 0.57 1.1 Miles  
 WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
 THIS MAP IS NOT TO BE USED FOR NAVIGATION

**ERIE COUNTY  
 DEPARTMENT OF ENVIRONMENT & PLANNING  
 OFFICE OF GIS**

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

1: 36,112












Figure 2. NWI Mapper  
1000 Bailey Ave, Buffalo Site Location



U.S. Fish and Wildlife Service, National Standards and Support Team,  
wetlands\_team@fws.gov

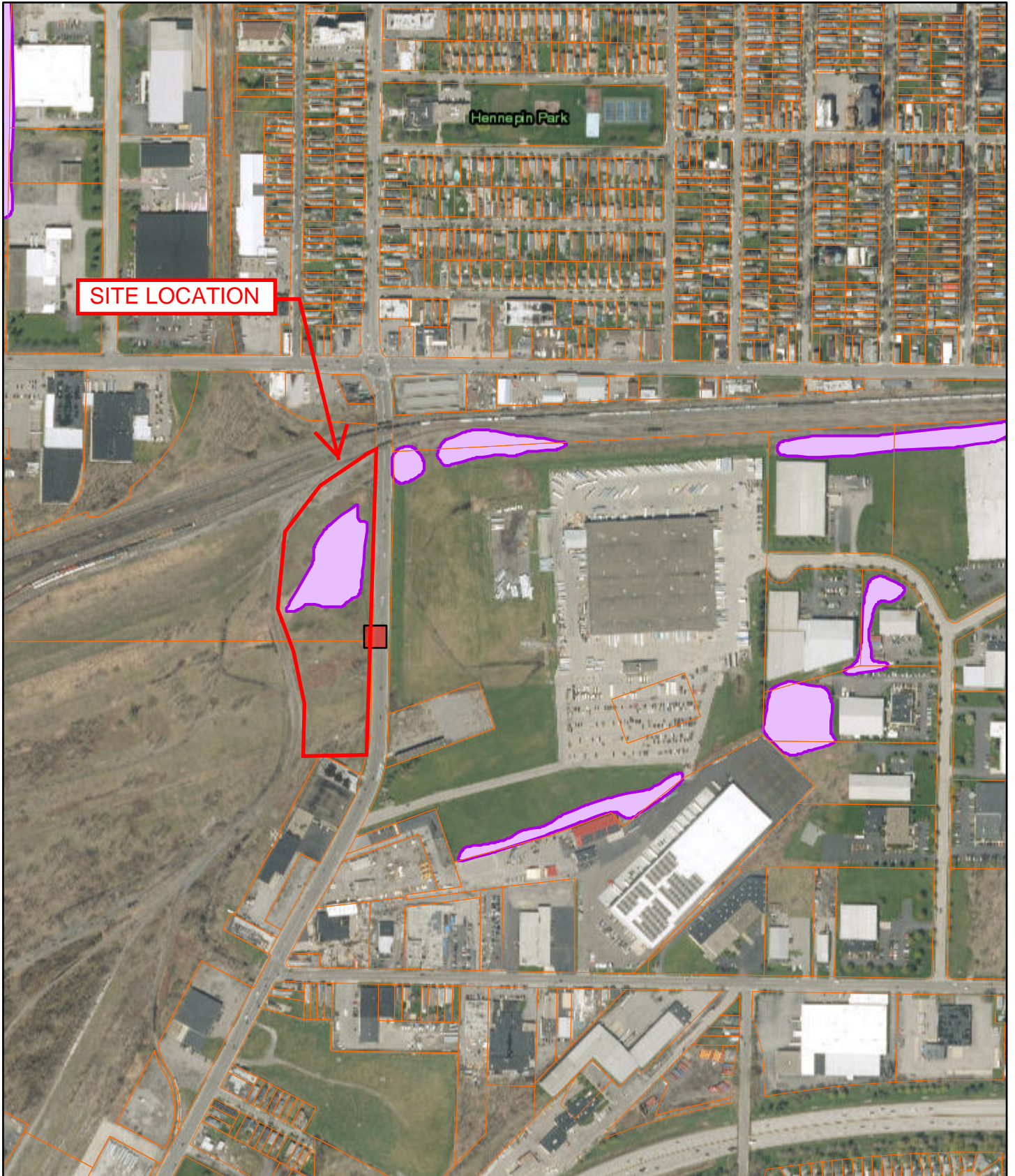
December 3, 2025

**Wetlands**

- |   |                                |   |                                   |   |          |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland       |  | Lake     |
|  | Estuarine and Marine Wetland   |  | Freshwater Forested/Shrub Wetland |  | Other    |
|   |                                |  | Freshwater Pond                   |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Figure 3. 1000 Bailey Ave, Buffalo, NY

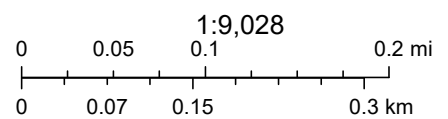


December 3, 2025

**WILSON**



**ENVIRONMENTAL  
TECHNOLOGIES, INC.**





Vantor, Esri, HERE, Garmin, iPC, NRCAN

NYS Department of Environmental Conservation  
Not a legal document

# Environmental Resource Mapper

## Visible Layers [Legend]

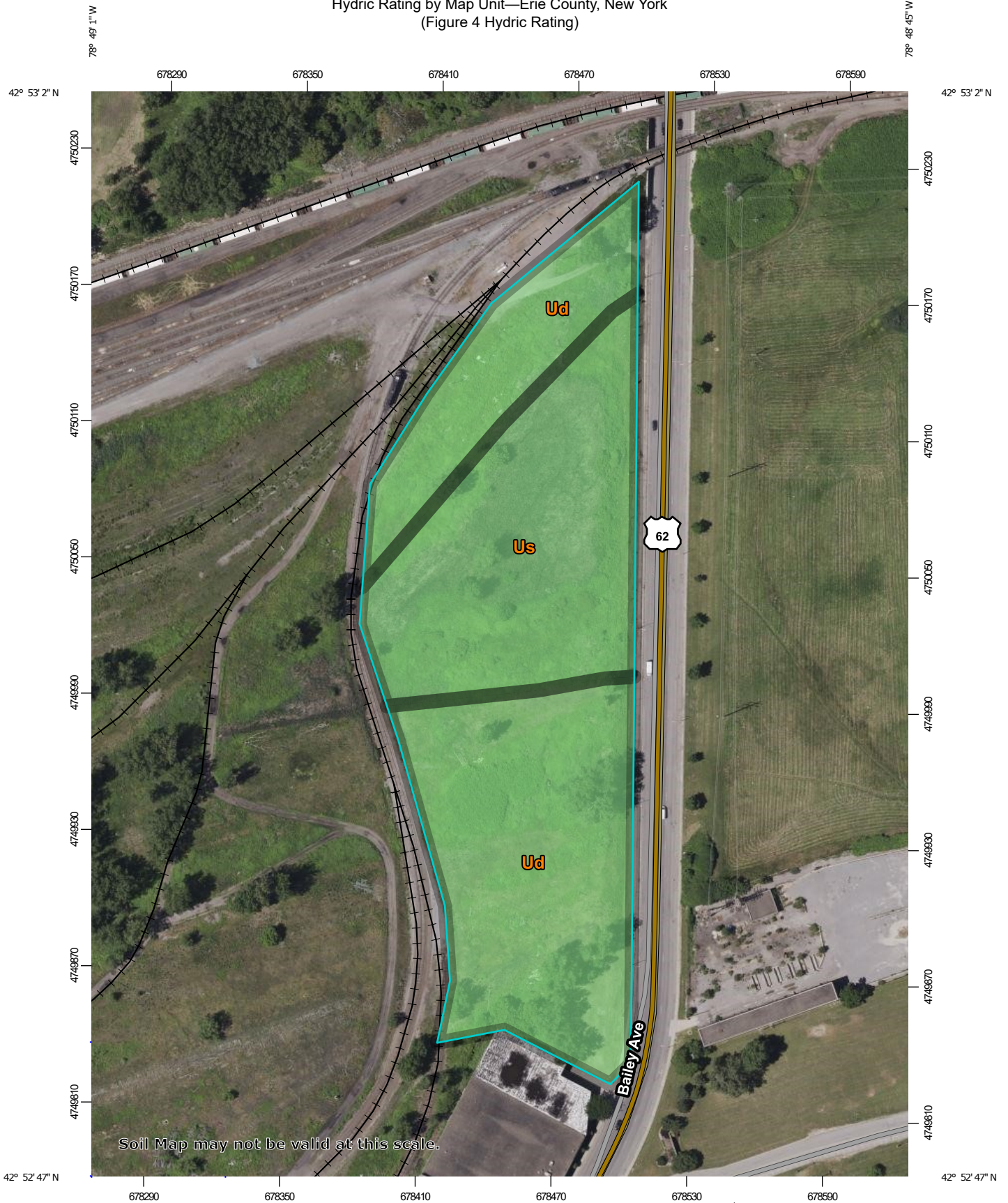
### Wetland Layers

-  Previously Mapped Freshwater Wetlands
-  Informational Freshwater Wetland Mapping

### Reference Layers

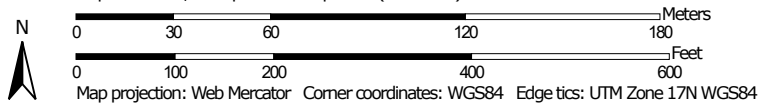
-  Tax Parcels

Hydric Rating by Map Unit—Erie County, New York  
(Figure 4 Hydric Rating)



Soil Map may not be valid at this scale.

Map Scale: 1:2,330 if printed on A portrait (8.5" x 11") sheet.



Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey

**WILSON**




ENVIRONMENTAL  
TECHNOLOGIES, INC. 12/3/2025  
Page 1 of 5

Hydric Rating by Map Unit—Erie County, New York  
(Figure 4 Hydric Rating)







**MAP LEGEND**

**Area of Interest (AOI)**







 Area of Interest (AOI)

**Soils**







**Soil Rating Polygons**

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


**Soil Rating Lines**

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available






**Soil Rating Points**

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

**MAP INFORMATION**

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Erie County, New York  
Survey Area Data: Version 25, Sep 4, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 9, 2022—Aug 15, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ud	Urban land	5	5.1	60.0%
Us	Urban land-Niagara complex	2	3.4	40.0%
<b>Totals for Area of Interest</b>			<b>8.5</b>	<b>100.0%</b>

## Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

### References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

## Rating Options

*Aggregation Method: Percent Present*

*Component Percent Cutoff: None Specified*

*Tie-break Rule: Lower*

Figure 5. Wetland Determination Field Sample Data Point Locations



42.88°

42.88°

- Sample Point
- Border

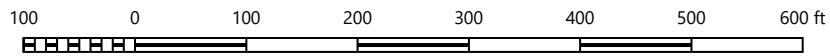
ExpertGPS Basemap: mapbox, OpenStreetMap

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