Jay-Hague Site (#C828216)
485 Hague Street
City of Rochester
Monroe County, New York

Interim Remedial Measure Work Plan

Prepared for:

Jay Hague Properties, LLC
12 Walnut Hill Drive
Penfield, New York 14526

Prepared By:

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339 East Avenue, Suite 200
Rochester, NY 14604

June 2022

Lu Project No. 50380-01

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Attachments

Certification

A I, Michael E. Hanscom, P.E., certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Report Interim Remedial Measure Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Michael E Hanscom
Signature

6/14/2022
Date

1.0 Introduction

Lu Engineers has prepared this Interim Remedial Measure (IRM) Work Plan on behalf of Jay Hague Properties, LLC to detail the scope of work for limited soil removal and installation of a soil cover system along portions of the eastern façade of existing buildings located at 485 Hague Street, City of Rochester, Monroe County, NY (Site). The Site location map is provided as Figure 1.

The Site is currently listed in the New York State Brownfield Cleanup Program (BCP) as Site #C828216). The cover system is being installed to address polycyclic aromatic hydrocarbons (PAHs) identified in surface soils in two (2) discrete greenspace areas along the eastern property line. The extent of impacts exceeding applicable criteria (discussed in Section 2.0), is depicted on Figure 2 – Site Plan. The identified impacts are likely due to the urban setting of the Site and industrial history of the neighborhood. PAHs in surface soils are common in urban settings, particularly in areas adjacent to roadways and parking lots. Elevated levels are generally attributed to human activity including extensive burning of coal/fossil fuels. It is noted that PAHs were not detected in any of the analyzed subsurface soil or groundwater samples.

This IRM Work Plan has been prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) procedures set forth in DER-10 *'Technical Guidance for Site Investigation and Remediation,'* dated May 2010, and complies with all applicable Federal, State and local laws, regulations and requirements.

1.1 Site Description

The Site is located at 485 Hague Street in the City of Rochester, New York (Figure 1), at the northwest corner of the intersection of Jay and Hague Streets. According to the City of Rochester Online Zoning Map, the Site is located within an urban area, and is comprised of approximately 1.36-acres of land zoned for industrial use. The Site is listed as parcel 105.80-1-13.001, which consists of 485 Hague Street and a rectangular portion of a parcel formerly listed as part of 1030 Jay Street (acquired in 2009).

1.2 Site History

The Site has been occupied by Woerner Industries, LLC (formerly Woerner Industries Inc.), a furniture manufacturing company, since the 1970s. Records indicate the Site has historically been utilized as a machine shop, metal stamping and fabrication shop, tool manufacturing operation, and a furniture manufacturing facility.

Historical use of the Site is summarized below:

1892-1912:
The Site was developed with a residential dwelling

1912-1950:
The Site was developed with a residential dwelling, along with several lumber storage buildings.

1950-1970:
Developed with a dwelling, a woodworking shop (current Building 1), machine shop (current Building 2), including one (1) underground storage tank (UST).

1970-present:
Developed with a woodworking shop (current Building 1), and a machine shop (current Building 2).

Refer to the Remedial Investigation (RI) Work Plan for a detailed summary of Site history and previous use.

1.3 Previous Investigations

From 1999 through 2022, a series of environmental assessments and investigations were conducted relative to the Site including:

- Phase I Environmental Site Assessment (ESA); February 1998 by C & O Technologies
- Phase II ESA; March 1998 by C & O Technologies
- Phase I ESA; December 1998 by C & O Technologies
- Phase I ESA (1030 Jay Street); February 2001 by Sear-Brown
- Phase II ESA (1030 Jay Street); February 2001 by Sear-Brown
- Remedial Activities Report (1030 Jay Street); January 2009 by Passero Associates
- Phase I ESA; September 2016 by LaBella Associates
- Phase II ESA; November 2016 by LaBella Associates
- Phase II Supplement; March 2017 by LaBella Associates
- Remedial Investigation; March 2021 by Lu Engineers

Brief descriptions of each of these investigations and assessments are provided in the Remedial Investigation Work Plan (RIWP) and Remedial Investigation Report (RIR).

2.0 Nature and Extent of Contamination

Surface soil samples were collected during the RI at two (2) bare/uncovered locations of the Site (SS-01 and SS-02), for analysis of:

- semi-volatile organic compounds (SVOCs) by United States Environmental Protection Agency (EPA) method 8270;
- volatile organic compounds (VOCs) by EPA method 8260;
- Resource Conservation and Recovery Act (RCRA) metals by EPA method 6010;
- pesticides/herbicides by EPA method 8081;
- polychlorinated biphenyls (PCBs) by EPA method 8082; and
- per/poly fluoroalkyl substances (PFAS) by EPA method 537.

Observed soils consisted of topsoil (primarily sand and silt) used within landscape areas. Sample locations are indicated on Figure 3. Analytical results for surface soil samples were compared to the NYSDEC Soil Cleanup Objectives (SCOs) presented in 6 New York Code Rules and Regulations Part 375-6.8(a) and (b) (effective December 14, 2006) and are presented in the attached Tables.

The following sections present a summary of the results.

SVOC Results:
Several SVOCs, specifically PAHs, were identified in exceedance of both Industrial Use SCOs and Protection of Groundwater Standards (PGSCOs) for samples SS-01 and SS-02.

- Benzo(a)pyrene was detected in exceedance of Industrial Use criteria in both SS-01 and SS-02 at concentrations of 4.0 ppm and 3.0 ppm, respectively.
- Benzo(a)anthracene†, benzo(b)fluoranthene†, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, chrysene, and phenol were all detected in exceedance of Unrestricted Use criteria at concentrations ranging from 0.39 to 4.9 ppm (below Industrial Use criteria).

Based on correspondence with NYSDEC, concentrations of PAHs in surface soils exceed Industrial Use SCOs and will require mitigation through implementation of a cover system.

Pesticide Results:
Several pesticides were detected at concentrations exceeding Unrestricted Use SCOs for both SS-01 and SS-02.

- 4,4'-DDT, alpha-chlordane, and dieldrin were detected in exceedance of Unrestricted Use criteria at concentrations ranging from 0.11 to 2.8 ppm (below Industrial Use SCOs).

Metals Results:
Several metals exhibited exceedances of Unrestricted Use SCOs for both SS-01 and SS-02.

- Lead and chromium were both detected in exceedance of Unrestricted Use criteria at both SS-01 (120 and 17.4 ppm respectively) and SS-02 (168 and 17.2† ppm respectively).

Surface soil analytical results for all other analyzed parameters (VOCs, PCBs, herbicides, and PFAS) were detected below Unrestricted Use SCOs. It is inferred that PAH impacts are limited to surface soils within the landscape areas along the eastern property line. Sampling of additional environmental media (i.e., subsurface soil, groundwater, & soil vapor) did not identify conditions necessitating remedial action. Based on sampling and analytical results observed during the RI, IRM work discussed herein will be limited to the landscape areas to address PAH exceedances of Industrial Use criteria.

Remediation of the documented surface soil exceedances will serve as the final remedy and attain Site compliance with Commercial Use standards. Additional confirmatory sampling is not proposed at this time.

3.0 IRM Scope of Work

The rationale for the selected scope of work is based on the present and intended use of the Site, investigations conducted at the Site to date, and coordination with the NYSDEC.

The soil cover system IRM will consist of the following:

- Pre-IRM utility stakeout
- Soft-excavation and disposal of impacted surface soils
- Demarcation barrier placement
- Importation and installation of certified clean fill (i.e. gravel and/or topsoil)
- Surface restoration (i.e. re-grading, re-seeding/mulching as necessary)

† Contaminant concentration exceeds PGSCOs

4.0 Pre-IRM Tasks

The following sections provide a summary of the components associated with implementation of the IRM.

4.1 Site Preparation and Security

Due to the proximity of the proposed cover system to the public right of way, a mandatory work permit will be obtained from the City of Rochester prior to IRM implementation. In order to safeguard the health and safety of Site workers and the general public, access to IRM work areas will be restricted. Perimeter fencing will be installed to facilitate Site control. Additionally, temporary construction fencing and appropriate signage will be erected around accessible excavations and staging areas to prevent unauthorized personnel from entering the work zone.

A Dig Safe New York UFPO stakeout will be called in prior to IRM implementation to verify the presence and location of nearby subsurface utility lines.

4.2 Waste Characterization

Analytical samples collected during the RI will be used to establish a non-hazardous waste profile with High Acres Landfill, an appropriately permitted waste receiving facility located in Perinton, NY. It is assumed that no more than 30-cubic yards (approximating 36.69-tons) of surface soil will be disposed of during IRM implementation. Based on NYSDEC correspondence, additional sampling is not required at this time.

5.0 IRM Implementation

The remediation contractor's field operations at the Site will commence with mobilization, which will include establishing the work area and erecting safety fencing, along with temporary controls identified in Section 4.1. All workers on-Site taking part in IRM activities will have completed the Occupational Health and Safety (OSHA) 40-Hazardous Waste Operations (HazWOPER) training with refresher courses (as needed) and possess current OSHA HazWOPER Certifications. Operation of heavy equipment on the work area will be limited throughout the duration of the project to 7:00 a.m. through 7:00 p.m. on weekdays.

5.1 Excavation

Excavation is planned within both landscape areas along the eastern edge of the Site and will include the removal and off-Site disposal of all generated topsoil and/or fill material. Soils excavated from the Site will not be reused at other sites. Due to the presence of multiple healthy trees within the proposed excavation areas, soft-excavation methods (i.e., compressed air and vacuum extraction) will be used to preserve the root systems and protect the health and quality of the trees. Tree removal is not recommended as part of the IRM.

Based on correspondence with the NYSDEC the depth of the excavation will be 1-foot below grade, as practicable. Previous surface soil sampling has been limited due to the robust tree root systems within the landscape areas. Excavations will be advanced up to a depth of 1-foot, or the maximum depth obtainable through the tree roots; whichever is attained first.

Tree roots will be wetted down as needed throughout the excavation process to ensure adequate moisture and preserve the health of the root systems.

Although petroleum or other similar impacts are not anticipated, qualified Lu Engineers personnel will screen the excavated materials for visual and olfactory observations and VOCs using a photoionization detector (PID). If encountered, impacted material will be evaluated and may be handled separately from the other excavated soils. Excavated material will be collected within a vacuum extraction drum trailer and transferred into 55-gallon drums for off-Site disposal.

Good housekeeping practices will be followed during IRM work to prevent spreading impacted material on the ground surface or from being tracked onto the road during transportation. Transportation of all wastes will be completed by properly permitted vehicles.

5.2 Cover System Construction

Construction of a soil cover system will follow excavation activities. Requirements for off-Site backfill soils characterization and placement are described below. The soil cover system will include placement of up to a 1-foot layer of certified clean backfill consisting of 6-inches of mineral soil followed by 6-inches of topsoil within the landscape areas. A demarcation layer consisting of chemically inert polyethylene barrier fencing will be placed within the excavation areas to serve as a visual barrier prior to backfill.

Backfilled soil and/or stone will be hand compacted with a tamper; placement of backfill will be conducted to achieve a stable and homogeneous cover system that is free of stratifications, lenses, or voids that may settle. Verification of soil cover depth will be performed by placement of pre-marked grade stakes in the designated areas to be covered at a spacing of no greater than 25-feet on center which will allow visual confirmation that 1-foot of cover has been achieved.

Imported materials will conform with criteria listed in NYSDEC DER-10 *'Technical Guidance for Site Investigation and Remediation'* Table 5.4(e)10 (refer to Section 5.3). Off-Site sources intended for use as backfill must be inspected and approved by the NYSDEC prior to acceptance at the Site. Acceptance of all off-Site borrow sources will only occur after the borrow site owner/operator submits a written certification that the site is neither known to have or exhibit evidence of disposal or release of hazardous or toxic substances, radioactive wastes, solid wastes or petroleum products.

5.3 Backfill Characterization

Unless existing characterization and/or verification is made available, backfill materials originating from off-Site sources will be subject to the following characterization requirements consistent with DER-10 Table 5.4(e)10:

Contaminant	**VOCs**	**SVOCs, Inorganics, PCBs, Pesticides**	
Soil Quantity (yd^3)	Discrete Samples	Composite Samples	Note:
0 - 50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50 - 100	2	1	

Characterization testing for off-Site sources will be performed by an independent, NYSDOH ELAP approved laboratory. It is estimated that up to 35 yd^3 of backfill material will be imported for IRM completion.

6.0 Health and Safety Monitoring

Monitoring of the work area and screening of soil and groundwater will be conducted throughout the duration of field activities to ensure the safety of on-Site workers. A copy of the Site-Specific Health and Safety Plan (HASP) is provided as Attachment A. The HASP will be reviewed by all employees visiting the Site before starting Site work. Monitoring of the work area and screening of soil and groundwater will be conducted throughout the duration of IRM activities using a MiniRAE 3000® PID equipped with a 10.6 eV lamp, as necessary.

All workers on-Site taking part in IRM activities will have completed the Occupational Health and Safety (OSHA) 40-Hazardous Waste Operations (HazWOPER) training with refresher courses (as needed) and possess current OSHA HazWOPER Certifications.

A copy of the HASP will be available on-Site at all times during the Site activities. All personnel will be required to follow HASP protocols at all times during Site work.

7.0 Community Air Monitoring

Continuous air monitoring will be conducted at upwind and downwind locations during all ground intrusive activities consistent with New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP). Particulate and vapor monitoring of the work areas will be conducted using a TSI Dust Trak™ II aerosol monitor (or equivalent) and PID, respectively.

The action threshold for VOCs established in the CAMP is 5 parts per million (ppm) above background. If this value is exceeded for the 15-minute average work will be halted and work may resume once instantaneous readings fall below 5 ppm. The action level for dust is 100 micrograms per cubic meter ($\mu g/m^3$) over background during a 15-minute average. If this limit is exceeded, dust suppression techniques will be employed, including using water to wet the area.

A special requirements CAMP has also been included since IRM activities will be conducted within 20-feet of occupied structures and potentially exposed populations. Continuous monitoring locations for VOCs and particulates will reflect the nearest potentially exposed individuals and at the location of ventilation system intakes for nearby structures. If warranted, the use of engineering controls such as vapor/dust barriers or special ventilation devices will be considered to prevent exposures related to the work activities and to control dust and odors.

8.0 Quality Assurance/Quality Control

Characterization testing for off-Site sources will be performed by an independent, NYSDOH ELAP approved laboratory. As necessary, an equivalent ASP Category B deliverables package will be generated with the data to allow data evaluation and preparation of a Data Usability Summary Report (DUSR) by an independent, third-party data validation expert.

Sampling and equipment decontamination will be conducted in accordance with the Quality Assurance Project Plan (QAPP), included as Attachment B.

Sampling methods and equipment for the field tasks have been chosen to minimize decontamination requirements, mitigating the potential for cross-contamination. Generation of investigation-derived wastes (IDWs) is not expected.

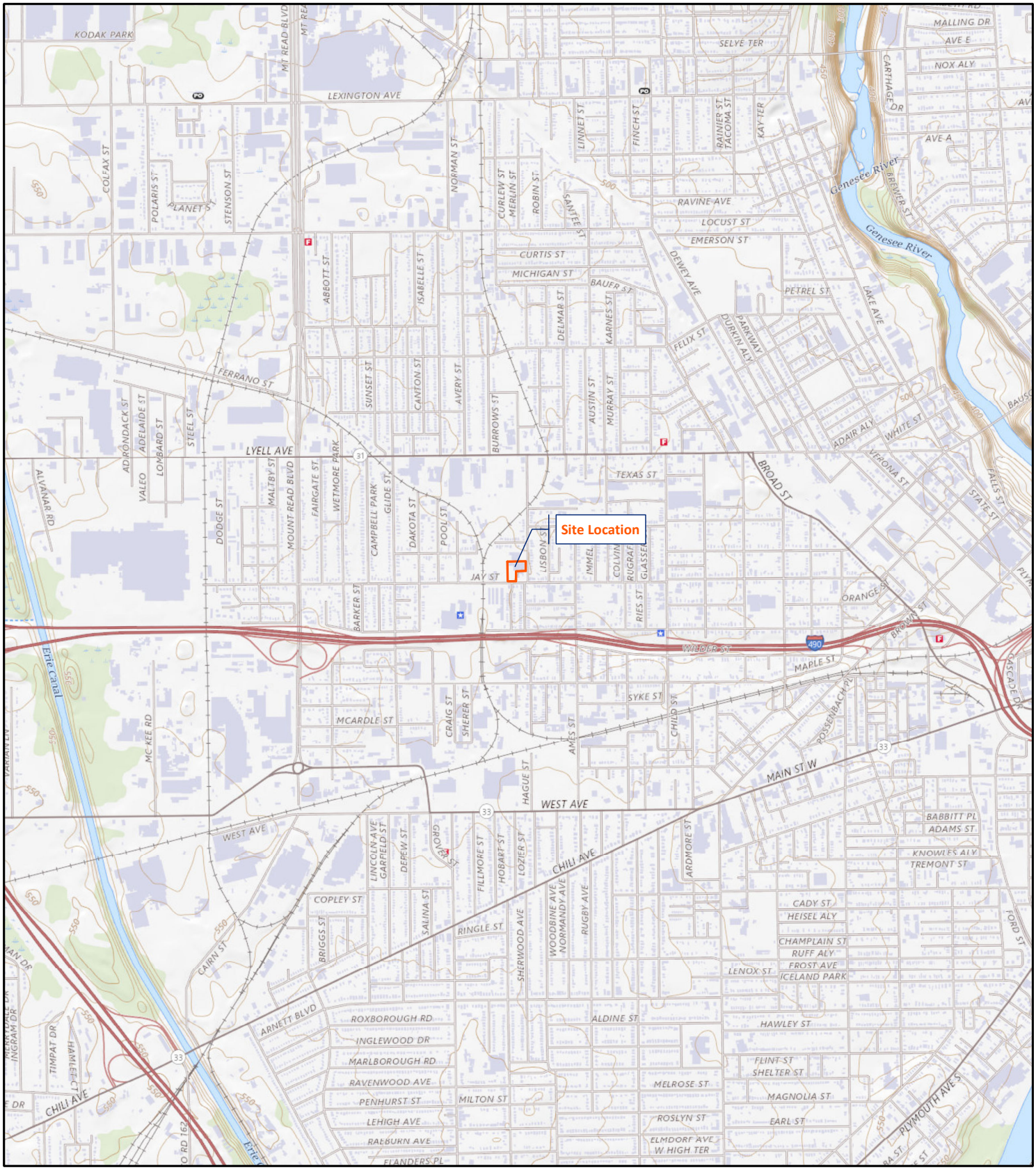
9.0 Reporting

An IRM Construction Completion Report (CCR) will be prepared, signed, and certified by a NYS-licensed PE, and will include the following components per DER-10:

- A description of the remedy, as constructed per the IRM Work Plan.
- A summary of the remedial action completed, including:
  - A descriptions of any problems encountered during construction and their associated resolution;
  - A description of changes to the IRM Work Plan with justification(s);
  - Quantities and concentrations of contaminated materials removed;
  - A listing of the waste streams, quantities of materials disposed and disposal facilities; and,
  - Restoration actions.
- Summary tables and figures indicating pre-IRM soil and groundwater data and post-excavation, confirmatory soil analytical data clearly showing the successful completion of the IRM. The figure(s) will show the volume of excavated soils and remaining, post-IRM impacted soils, if any.
- A detailed description of the applicable areas of remedial action compliance (e.g., NYSDEC SCOs, CAMP summaries, etc.).
- PE-stamped As-Built drawing of the IRM work, including all soil removals with surveyed limits of the excavation and locations of final confirmatory samples.
- Identification of applicable institutional controls, if any.

10.0 Project Schedule

Action	Anticipated Date
IRM Implementation	July 2022
IRM Construction Completion Report submission	August 2022
SMP submission	August 2022
Environmental Easement Package	August 2022
Final Engineering Report submission	September 2022



Scale 1: 24,000

Contour Interval: 10-feet

1,000 0 1,000 2,000 4,000

Feet

N

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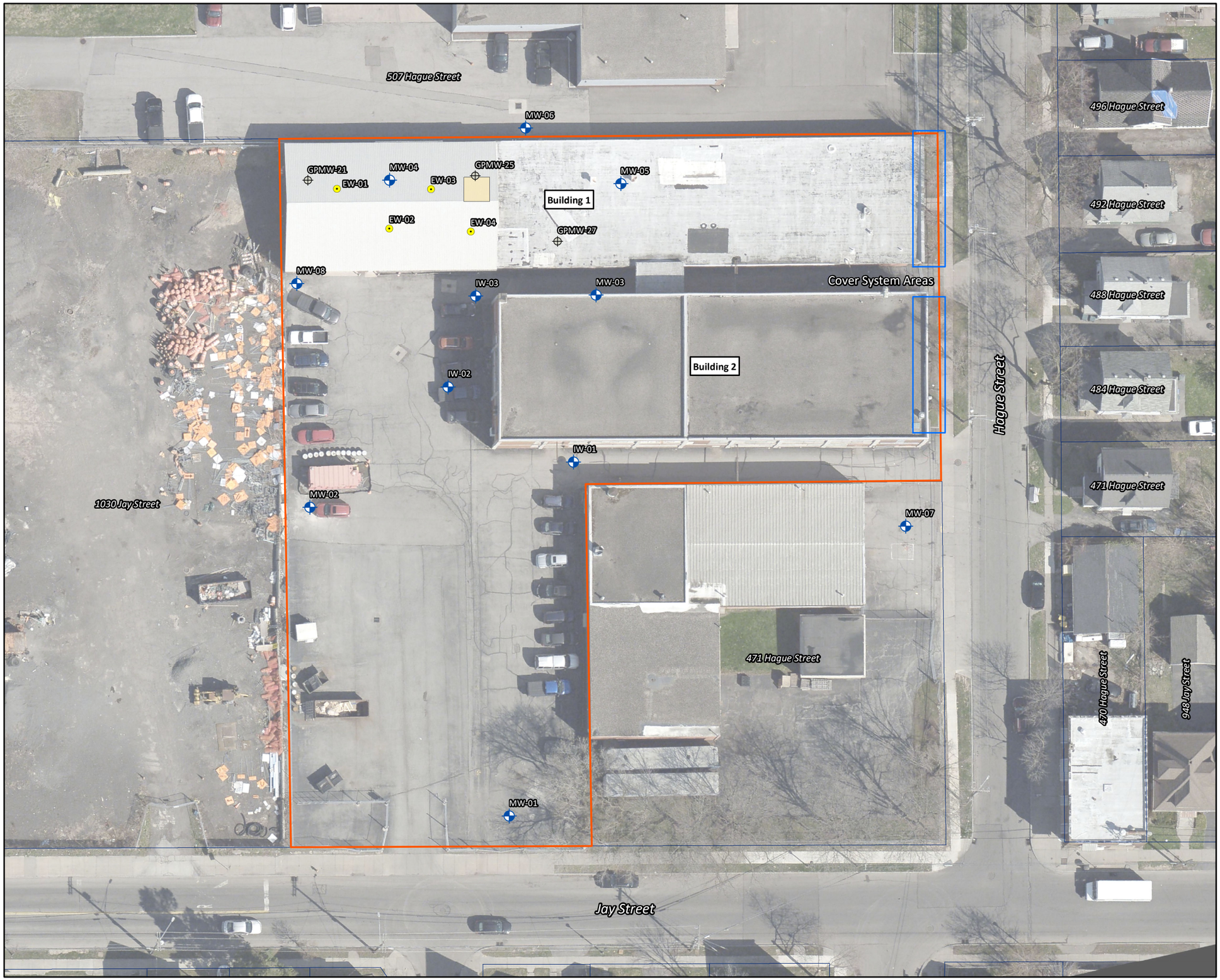
Figure 1. Site Location Map
Jay-Hague Site (#C828216)
IRM Work Plan
485 Hague Street, Rochester NY

DATE: June 2022
PROJECT #: 50380
DRAWN/CHECKED: BGS/GLA
DATA SOURCE: USGS Topo Basemap from ArcGIS Online



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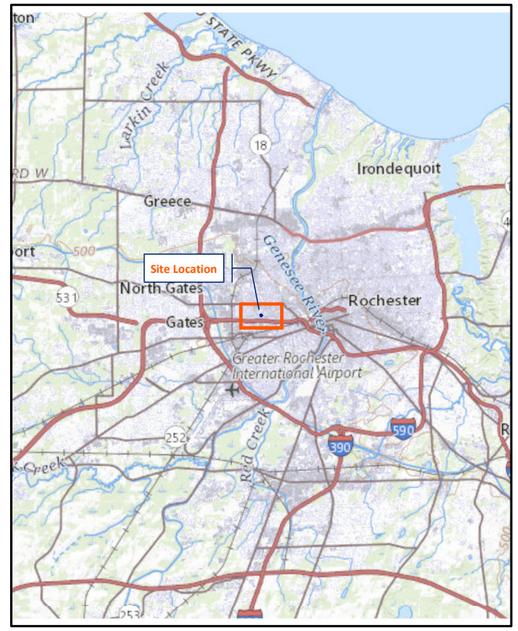


Figure 2.
Site Plan

Project:
Jay-Hague Site (#C828216)
IRM Work Plan

Location:
485 Hague Street
City of Rochester, Monroe County, NY

Legend

- Site Boundary
- Parcel Boundary
- Former Paint Storage Building
- Extraction Well
- Monitoring Well
- Mini-well

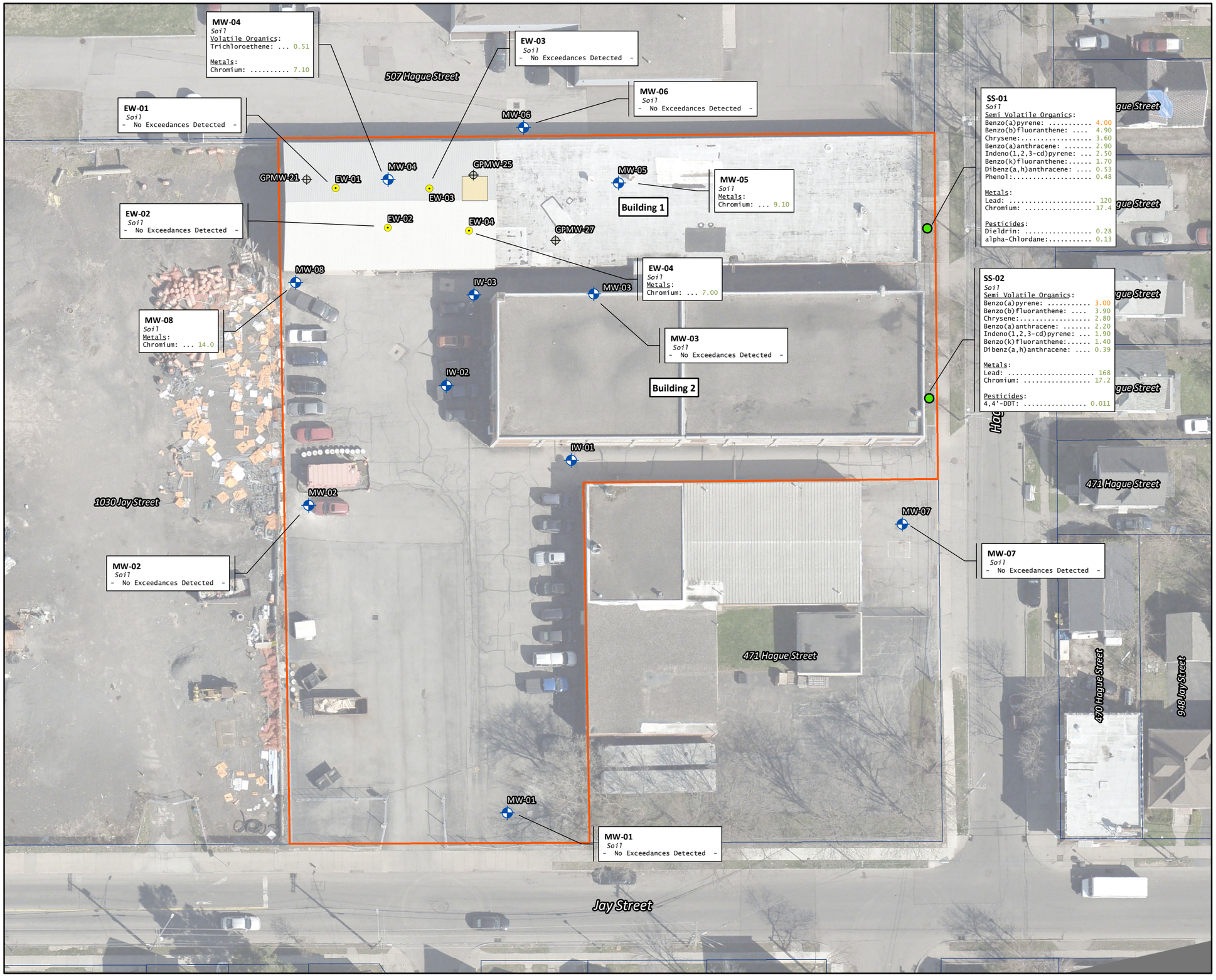
N

1 inch=40 feet

0 20 40 80 Feet

Drawn/Checked By:	BGS/GLA
Lu Project Number:	50380
Date:	June 2022

General:
1. Coordinate System: NAD 1983 State Plane NY West FIPS 3103 Feet
2. Orthoimagery (April 2021) downloaded from Pictometry
3. Scale: 1:480 (original document size 11"x17")



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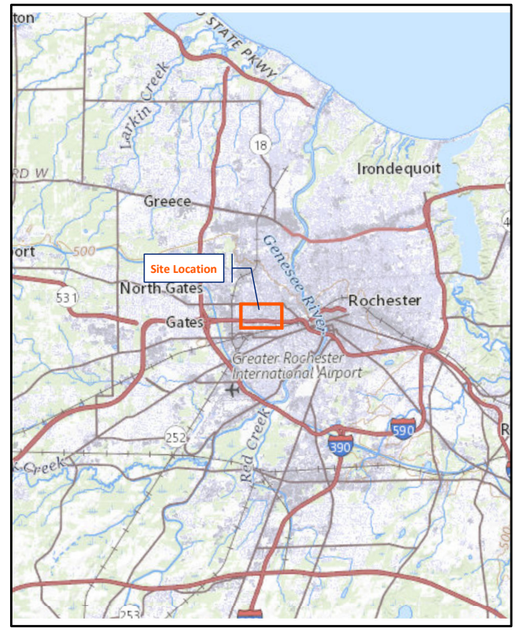

Figure 3.
Soil Sample Analytical Results

Project:
Jay-Hague Site (#C828216)
IRM Work Plan

Location:
485 Hague Street
City of Rochester, Monroe County, NY

Legend

- Site Boundary
- Former Paint Storage Building
- Extraction Well
- Monitoring Well
- Mini-well
- Surface Soil Sample

NOTES:
TEXT Indicates Unrestricted Use Exceedance
TEXT Indicates Industrial Use Exceedance
- All results presented in parts per million (ppm)

N
1 inch=40 feet
0 20 40 80 Feet

Drawn/Checked By:	BGS/GLA
Lu Project Number:	50380
Date:	May 2022

Notes:
1. Coordinate System: NAD 1983 (2011) State Plane NY West FIPS 3103 Feet
2. Orthoimagery (October 2019) downloaded from Pictometry
3. Scale: 1:480 (original document size 11"x17")

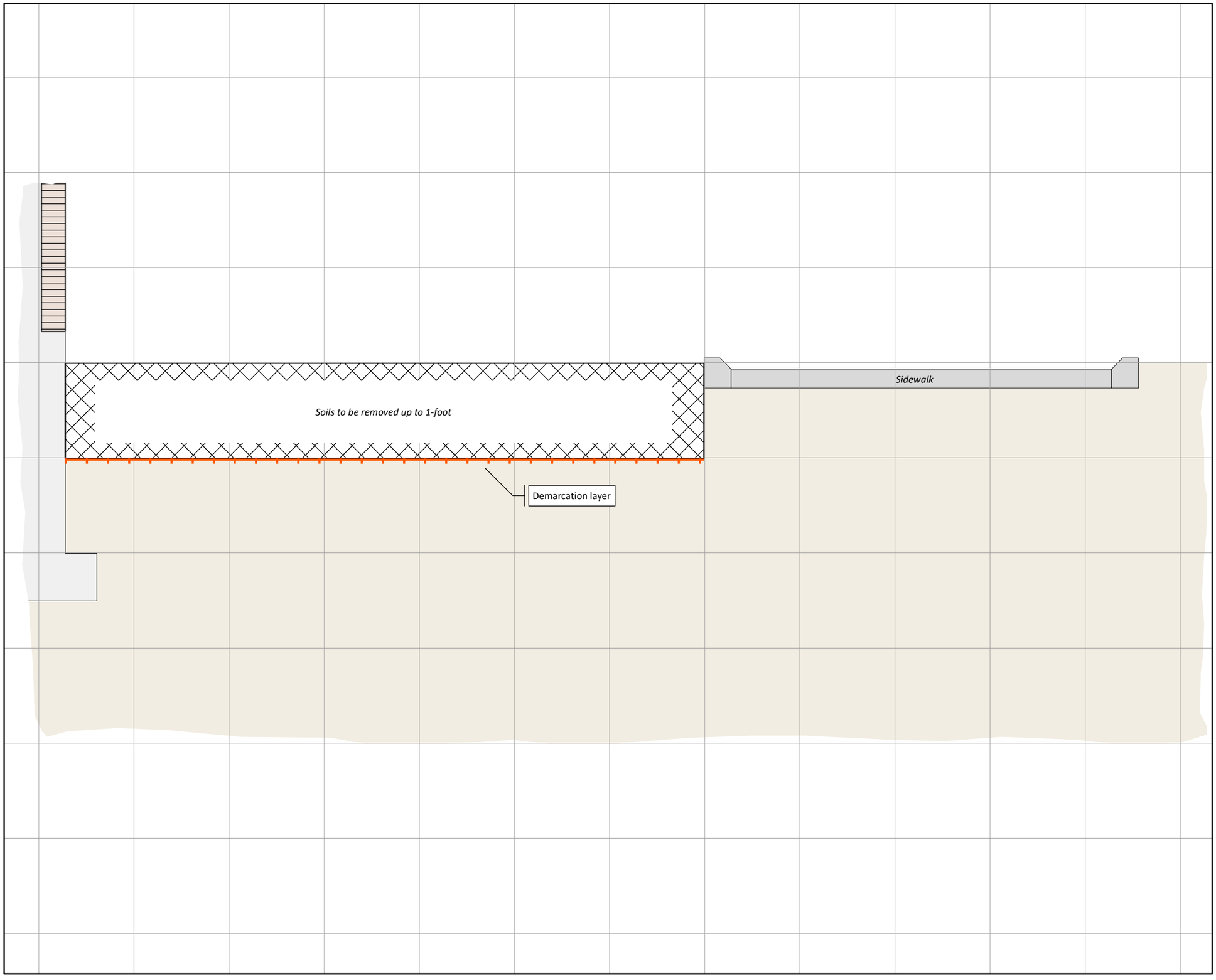

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Figure 4.
Typical Soil Cover System Detail

Project:
Jay-Hague Site (#C828216)
IRM Work Plan

Location:
485 Hague Street
City of Rochester, Monroe County, NY

0.5'

Vertical Scale: 1" = 1'

Horizontal Scale: 1" = 1'

1'

Drawn/Checked By:	BGS/GLA
Lu Project Number:	50380
Date:	May 2022

General:
- Refer to soil boring logs for stratigraphic changes

Jay-Hague Site (#C828216)
Remedial Investigation
Soil Sample Analytical Results

Table 1-1: VOC Soil Sample Analytical Results

Detected Parameters[1]	Unrestricted Use[2]	Residential Use[3]	Restricted-Residential Use[3]	Commercial Use[3]	Industrial Use[3]	Protection of Groundwater[4]	Sample ID:	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	MW-07	MW-08	EW-01	EW-02	EW-03	EW-04	SS-01	SS-02
							Sample Depth:	11-12'	11-12'	9-10'	13-14'	12-13'	10-13'	10'	14-15'	13-14'	12-14'	9-10'	13-14'	0-2"	0-2"
							Sample Date:	2/17/2021	2/23/2021	3/1/2021	2/25/2021	2/26/2021	2/15/2021	2/16/2021	2/23/2021	2/26/2021	2/26/2021	2/24/2021	2/24/2021	3/3/2021	3/3/2021
Volatile Organic Compounds (VOCs)																					
1,1,1-Trichloroethane (TCA)	0.68	100	100	500	1,000	0.68	ppm	< 0.0057	< 0.0055	**0.0019 J**	**0.0015 J**	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	**0.0021 J**	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,1,2-Trichloroethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,1-Dichloroethane (1,1-DCA)	0.27	19.0	26.0	240	480	0.27	ppm	< 0.0057	< 0.0055	**0.0004 J**	**0.0020 J**	< 0.0056	< 0.0058	< 0.0057	**0.0009 J**	< 0.0057	**0.0006 J**	< 0.0060	**0.0018 DJ**	< 0.0069	< 0.0067
1,1-Dichloroethene (1,1-DCE)	0.33	100	100	500	1,000	0.33	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,2,3-Trichlorobenzene	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,2,4-Trichlorobenzene	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,2-Dibromo-3-chloropropane (DBCP)	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,2-Dibromoethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,2-Dichlorobenzene	1.10	100	100	500	1,000	1.10	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	**0.0004 J**	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,2-Dichloroethane	0.02	2.30	3.10	30	60	0.02	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,2-Dichloropropane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,3-Dichlorobenzene	2.40	17.0	49.0	280	560	2.40	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,4-Dichlorobenzene	1.80	9.8	13.0	130	250	1.80	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
1,4-Dioxane	0.10	9.8	13.0	130	250	0.10	ppm	NA	NA	NA	< 0.5500	< 0.1100	NA	NA	< 0.1200	NA	NA	NA	< 0.2800	< 0.1400	< 0.1300
2-Butanone (MEK)	0.12	100	100	500	1,000	0.12	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
2-Hexanone	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
4-Methyl-2-pentanone	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Acetone	0.05	100	100	500	1,000	0.05	ppm	**0.0063**	< 0.0055	**0.0094**	< 0.0280	**0.0078**	**0.0070**	**0.0160**	**0.0087**	**0.0068**	**0.0092**	**0.0100**	< 0.0140	< 0.0069	< 0.0067
Benzene	0.06	2.90	4.80	44.0	89.0	0.06	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Bromochloromethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Bromodichloromethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Bromoform	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Bromomethane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Carbon Disulfide	--	--	--	--	--	--	ppm	NA	NA	NA	**0.0022 J**	**0.0011 J**	NA	NA	**0.0012 J**	NA	NA	NA	**0.0015 DJ**	< 0.0069	< 0.0067
Carbon Tetrachloride	0.76	1.40	2.40	22.0	44.0	0.76	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Chlorobenzene	1.10	100	100	500	1,000	1.10	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Chloroethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Chloroform	0.37	10.0	49.0	350	700	0.37	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Chloromethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Cyclohexane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Dibromochloromethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Dichlorodifluoromethane (CFC 12)	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Dichloromethane	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Ethylbenzene	1.00	30.0	41.0	390	780	1.00	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Isopropylbenzene (Cumene)	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Methyl Acetate	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Methyl tert-Butyl Ether	0.93	62.0	100	500	1,000	0.93	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Methylcyclohexane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Styrene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Tetrachloroethene (PCE)	1.30	10.0	21.0	150	300	1.30	ppm	< 0.0057	< 0.0055	**0.00043 J**	**0.0045 J**	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	**0.0007 J**	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Toluene	0.70	100	100	500	1,000	0.70	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
Trichloroethene (TCE)	0.47	10.0	21.0	200	400	0.47	ppm	< 0.0057	**0.0093**	**0.0740**	***0.5100* J***	**0.0015 J**	**0.0009 J**	**0.0033 J**	**0.1100**	**0.1000**	**0.0500**	**0.1400**	**0.2400 D**	**0.0036 J**	**0.0017 J**
Trichlorofluoromethane (CFC 11)	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
Vinyl Chloride	0.02	0.21	0.90	13.0	27.0	0.02	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
cis-1,2-Dichloroethene	0.25	59	100	500	1,000	0.25	ppm	< 0.0057	**0.0003 J**	< 0.0062	**0.0087 J**	< 0.0056	< 0.0058	< 0.0057	< 0.0060	**0.0008 J**	**0.0011 J**	**0.0017 J**	**0.0062 DJ**	< 0.0069	< 0.0067
cis-1,3-Dichloropropene	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0140	< 0.0069	< 0.0067
m,p-Xylenes	0.26	100	100	500	1,000	1.60	ppm	NA	NA	NA	< 0.0550	< 0.0110	NA	NA	< 0.0120	NA	NA	NA	< 0.0280	< 0.0140	< 0.0130
o-Xylene	0.26	100	100	500	1,000	1.60	ppm	NA	NA	NA	< 0.0280	< 0.0056	NA	NA	< 0.0060	NA	NA	NA	< 0.0140	< 0.0069	< 0.0067
trans-1,2-Dichloroethene	0.19	100	100	500	1,000	0.19	ppm	< 0.0057	**0.0007 J**	< 0.0062	**0.0260 J**	< 0.0056	< 0.0058	< 0.0057	< 0.0060	**0.0017 J**	**0.0022 J**	**0.0019 J**	**0.0083 DJ**	< 0.0069	< 0.0067
trans-1,3-Dichloropropene	--	--	--	--	--	--	ppm	< 0.0057	< 0.0055	< 0.0062	< 0.0280	< 0.0056	< 0.0058	< 0.0057	< 0.0060	< 0.0057	< 0.0060	< 0.0060	< 0.0055	< 0.0069	< 0.0067

Notes

1 – Results compared to *'6 NYCRR Part 375 Environmental Remedial Programs'* Soil Cleanup Objectives (SCOs)

2 – Table 6.8(a) Unrestricted Use SCOs

3 – Table 6.8(b) Restricted Use SCOs: Industrial Use

4 – Table 6.8(b) Restricted Use SCOs: Protection of Groundwater

ppb: Parts per billion

< : Results not detected above minimum laboratory quantitation limit

Results exceed Unrestricted Use SCOs

Results exceed Industrial Use SCOs

* Results exceed Protection of Groundwater SCOs

J: Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL

D: Concentration is a result of a dilution

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Jay-Hague Site (#C828216)
Remedial Investigation
Soil Sample Analytical Results

Table 1-2. SVOC Soil Sample Analytical Results

Detected Parameters[1]	Unrestricted Use[2]	Residential Use[3]	Restricted-Residential Use[3]	Commercial Use[3]	Industrial Use[3]	Protection of Groundwater[4]	Sample ID:	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	MW-07	MW-08	EW-01	EW-02	EW-03	EW-04	SS-01	SS-02
							Sample Depth:	11-12'	11-12'	9-10'	13-14'	12-13'	10-13'	10'	14-15'	13-14'	12-14'	9-10'	13-14'	0-2"	0-2"
							Sample Date:	2/17/2021	2/23/2021	3/1/2021	2/25/2021	2/26/2021	2/15/2021	2/16/2021	2/23/2021	2/26/2021	2/26/2021	2/24/2021	2/24/2021	3/3/2021	3/3/2021
Semi-Volatile Organic Compounds (SVOCs)																					
1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
1,4-Dioxane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,3,4,6-Tetrachlorophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,4,5-Trichlorophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,4,6-Trichlorophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,4-Dichlorophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,4-Dimethylphenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,4-Dinitrophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	< 2.40	2.40
2,4-Dinitrotoluene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,6-Dinitrotoluene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2-Chloronaphthalene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2-Chlorophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2-Methylnaphthalene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.12 J**	**0.10 J**
2-Methylphenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2-Nitroaniline	--	--	--	--	--	--	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	< 2.40	2.40
2-Nitrophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
3,3'-Dichlorobenzidine	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
3- and 4-Methylphenol Coelution	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
3-Nitroaniline	--	--	--	--	--	--	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	< 2.40	2.40
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	< 2.40	2.40
4-Bromophenyl Phenyl Ether	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
4-Chloro-3-methylphenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
4-Chloroaniline	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
4-Chlorophenyl Phenyl Ether	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
4-Nitroaniline	--	--	--	--	--	--	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	< 2.40	2.40
4-Nitrophenol	--	--	--	--	--	--	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	< 2.40	2.40
Acenaphthene	20.0	100	100	500	1,000	98	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.16 J**	**0.09 J**
Acenaphthylene	100	100	100	500	1,000	107	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Acetophenone	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Anthracene	100	100	100	500	1,000	1,000	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.62**	**0.45 J**
Atrazine	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Benz(a)anthracene	1.00	1.00	1.00	5.60	11.0	1.00	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	***2.90 ****	***2.20 ****
Benzaldehyde	--	--	--	--	--	--	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	**0.70 J**	**0.30 J**
Benzo(a)pyrene	1.00	1.00	1.00	1.00	1.10	22.0	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**4.00**	**3.00**
Benzo(b)fluoranthene	1.00	1.00	1.00	5.60	11.0	1.70	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	***4.90 ****	***3.90 ****
Benzo(g,h,i)perylene	100	100	100	500	1,000	1,000	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**2.20**	**1.70**
Benzo(k)fluoranthene	0.80	1.00	3.90	56.0	110	1.70	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**1.70**	**1.40**
Biphenyl	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
2,2'-Oxybis(1-chloropropane)	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Bis(2-chloroethoxy)methane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Bis(2-chloroethyl) Ether	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Bis(2-ethylhexyl) Phthalate	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.57	< 0.55	NA	NA	< 0.62	NA	NA	NA	< 0.580	**2.70**	**1.70**
Butyl Benzyl Phthalate	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.13 J**	**0.20 J**
Caprolactam	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Carbazole	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.46 J**	**0.39 J**
Chrysene	1.00	1.00	3.90	56.0	110	1.00	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	***3.60 ****	***2.80 ****
Di-n-butyl Phthalate	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.28 J**	**0.11 J**
Di-n-octyl Phthalate	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Dibenz(a,h)anthracene	0.33	0.33	0.33	0.56	1.10	1,000	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.53**	**0.39**
Dibenzofuran	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.13 J**	0.46
Diethyl Phthalate	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Dimethyl Phthalate	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Fluoranthene	100	100	100	500	1,000	1,000	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**6.40**	**5.40**
Fluorene	30.0	100	100	500	1,000	386	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.17 J**	**0.12 J**
Hexachlorobenzene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Hexachlorobutadiene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Hexachlorocyclopentadiene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Hexachloroethane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Indeno(1,2,3-cd)pyrene	0.50	0.50	0.50	5.60	11.0	8.20	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**2.50**	**1.90**
Isophorone	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
N-Nitrosodiphenylamine	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Naphthalene	12.0	100	100	500	1,000	12.0	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.16 J**	**0.09 J**
Nitrobenzene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	< 0.47	0.46
Pentachlorophenol (PCP)	0.80	2.40	6.70	6.70	55.0	0.80	ppm	NA	NA	NA	< 1.90	< 1.90	NA	NA	< 2.10	NA	NA	NA	< 2.000	< 2.40	2.40
Phenanthrene	100	100	100	500	1,000	1,000	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**3.00**	**2.40**
Phenol	0.33	100	100	500	1,000	3.30	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	< 0.41	NA	NA	NA	< 0.380	**0.48**	**0.15 J**
Pyrene	100	100	100	500	1,000	1,000	ppm	NA	NA	NA	< 0.38	< 0.36	NA	NA	**0.07 J**	NA	NA	NA	< 0.380	**5.40**	**4.30**

Notes

1 – Results compared to *'6 NYCRR Part 375 Environmental Remedial Programs'* Soil Cleanup Objectives (SCOs)

2 – Table 6.8(a) Unrestricted Use SCOs

3 – Table 6.8(b) Restricted Use SCOs: Industrial Use

4 – Table 6.8(b) Restricted Use SCOs: Protection of Groundwater

ppb: Parts per billion

< : Results not detected above minimum laboratory quantitation limit

	Results exceed Unrestricted Use SCOs
	Results exceed Industrial Use SCOs
*	Results exceed Protection of Groundwater SCOs

J: Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL

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Jay-Hague Site (#C828216)
Remedial Investigation
Soil Sample Analytical Results

Table 1-3. RCRA Metal, Pesticide, Herbicide & PCB Soil Sample Analytical Results

Detected Parameters[1]	Unrestricted Use[2]	Residential Use[3]	Restricted-Residential Use[3]	Commercial Use[3]	Industrial Use[3]	Protection of Groundwater[4]	Sample ID:	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	MW-07	MW-08	EW-01	EW-02	EW-03	EW-04	SS-01	SS-02
							Sample Depth:	11-12'	11-12'	9-10'	13-14'	12-13'	10-13'	10'	14-15'	13-14'	12-14'	9-10'	13-14'	0-2"	0-2"
							Sample Date:	2/17/2021	2/23/2021	3/1/2021	2/25/2021	2/26/2021	2/15/2021	2/16/2021	2/23/2021	2/26/2021	2/26/2021	2/24/2021	2/24/2021	3/3/2021	3/3/2021
RCRA Metals																					
Arsenic	13.0	16.0	16.0	16.0	16.0	16.0	ppm	NA	NA	NA	**2.0**	**2.2**	NA	NA	**4.1**	NA	NA	NA	**2.0**	**9.1**	**7.5**
Barium	350	350	400	400	10,000	820	ppm	NA	NA	NA	**44**	**52.6**	NA	NA	**143**	NA	NA	NA	**32.9**	**161**	**107**
Cadmium	2.50	2.50	4.30	9.30	60.0	7.50	ppm	NA	NA	NA	< 0.540	< 0.559	NA	NA	< 0.565	NA	NA	NA	< 0.555	**0.986**	**1.0**
Mercury	0.18	0.81	0.81	2.80	5.70	0.73	ppm	NA	NA	NA	< 0.037	< 0.037	NA	NA	< 0.037	NA	NA	NA	< 0.034	**0.173**	**0.161**
Chromium[X]	1.00	22.0	110	400	800	19.0	ppm	NA	NA	NA	**7.1**	**9.1**	NA	NA	**14**	NA	NA	NA	**7.0**	**17.4**	**17.2**
Lead	63.0	400	400	1,000	3,900	450	ppm	NA	NA	NA	**2.8 J**	**4.0 J**	NA	NA	**11.7**	NA	NA	NA	**2.5 J**	**120**	**168**
Selenium	3.90	36.0	180	1,500	6,800	4.00	ppm	NA	NA	NA	< 1.1	< 1.1	NA	NA	**0.723 J**	NA	NA	NA	< 1.1	< 1.3	< 1.3
Silver	2.00	36.0	180	1,500	6,800	8.30	ppm	NA	NA	NA	< 1.1	< 1.1	NA	NA	< 1.1	NA	NA	NA	< 1.1	**1.4**	**1.0 J**
Pesticides																					
4,4'-DDD	0.0033	2.60	13.0	92.0	180	14.0	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
4,4'-DDE	0.0033	1.80	8.90	62.0	120	17.0	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
4,4'-DDT	0.0033	1.70	7.90	47.0	94.0	136	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	**0.011 J**
Aldrin	0.005	0.019	0.097	0.68	1.40	0.19	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Chlordane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.009	< 0.010	NA	NA	< 0.100	NA	NA	NA	< 0.009	< 0.120	< 0.11
Dieldrin	0.005	0.039	0.20	1.40	2.80	0.10	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	**0.280**	< 0.022
Endosulfan I	2.40	4.80	24.0	200	920	102	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Endosulfan II	2.40	4.80	24.0	200	920	102	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Endosulfan Sulfate	2.40	4.80	24.0	200	920	1,000	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Endrin	0.01	2.20	11.0	89.0	410	0.06	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Endrin Aldehyde	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	**0.016 J**	**0.023**
Endrin Ketone	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Heptachlor	0.042	0.42	2.10	15.0	29.0	0.38	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Heptachlor Epoxide	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	**0.024 J**	< 0.022
Methoxychlor	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
Mirex	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	**0.110**	NA	NA	NA	< 0.002	**0.030 P**	**0.024 P**
Toxaphene	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.036	< 0.038	NA	NA	< 0.410	NA	NA	NA	< 0.037	< 0.460	< 0.43
alpha-BHC	0.02	0.097	0.48	3.40	6.80	0.02	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
alpha-Chlordane	0.094	0.91	4.20	24.0	47.0	2.90	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	**0.130**	< 0.022
beta-BHC	0.036	0.072	0.36	3.00	14.0	0.09	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
delta-BHC	0.04	100	100	500	1,000	0.25	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
gamma-BHC (Lindane)	0.10	0.28	1.30	9.20	23.0	0.10	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	< 0.024	< 0.022
gamma-Chlordane	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.002	< 0.002	NA	NA	< 0.021	NA	NA	NA	< 0.002	**0.100**	< 0.022
Herbicides																					
2,4,5-T	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.011	< 0.011	NA	NA	< 0.012	NA	NA	NA	< 0.011	< 0.014	< 0.013
2,4,5-TP	3.80	58.0	100	500	1,000	3.80	ppm	NA	NA	NA	< 0.011	< 0.011	NA	NA	< 0.012	NA	NA	NA	< 0.011	< 0.014	< 0.013
2,4-D	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.011	< 0.011	NA	NA	< 0.012	NA	NA	NA	< 0.011	< 0.014	< 0.013
Dicamba	--	--	--	--	--	--	ppm	NA	NA	NA	< 0.011	< 0.011	NA	NA	< 0.012	NA	NA	NA	< 0.011	< 0.014	< 0.013
Polychlorinated Biphenyls																					
Aroclor 1016	0.10	1.00	1.00	1.00	25.0	3.20	ppm	NA	NA	NA	< 0.036	< 0.038	NA	NA	< 0.041	NA	NA	NA	< 0.037	< 0.046	< 0.043
Aroclor 1221	0.10	1.00	1.00	1.00	25.0	3.20	ppm	NA	NA	NA	< 0.072	< 0.076	NA	NA	< 0.082	NA	NA	NA	< 0.075	< 0.093	< 0.087
Aroclor 1232	0.10	1.00	1.00	1.00	25.0	3.20	ppm	NA	NA	NA	< 0.036	< 0.038	NA	NA	< 0.041	NA	NA	NA	< 0.037	< 0.046	< 0.043
Aroclor 1242	0.10	1.00	1.00	1.00	25.0	3.20	ppm	NA	NA	NA	< 0.036	< 0.038	NA	NA	< 0.041	NA	NA	NA	< 0.037	< 0.046	< 0.043
Aroclor 1248	0.10	1.00	1.00	1.00	25.0	3.20	ppm	NA	NA	NA	< 0.036	< 0.038	NA	NA	< 0.041	NA	NA	NA	< 0.037	< 0.046	< 0.043
Aroclor 1254	0.10	1.00	1.00	1.00	25.0	3.20	ppm	NA	NA	NA	< 0.036	< 0.038	NA	NA	< 0.041	NA	NA	NA	< 0.037	< 0.046	< 0.043
Aroclor 1260	0.10	1.00	1.00	1.00	25.0	3.20	ppm	NA	NA	NA	< 0.036	< 0.038	NA	NA	< 0.041	NA	NA	NA	< 0.037	< 0.046	< 0.043

Notes

1 – Results compared to *'6 NYCRR Part 375 Environmental Remedial Programs'* Soil Cleanup Objectives (SCOs)
2 – Table 6.8(a) Unrestricted Use SCOs
3 – Table 6.8(b) Restricted Use SCOs: Industrial Use
4 – Table 6.8(b) Restricted Use SCOs: Protection of Groundwater
X: Hexavalent chromium standard used as most conservative guidance value
ppb: Parts per billion
ppm: Parts per million
< : Results not detected above minimum laboratory quantitation limit

	Results exceed Unrestricted Use SCOs
	Results exceed Industrial Use SCOs
*	Results exceed Protection of Groundwater SCOs

J: Estimated value due to either being a Tentatively Identified Compound (TIC)
or that the concentration is between the MRL and the MDL
P: Concentration >40% difference between the two GC columns

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Jay-Hague Site (#C828216)
Remedial Investigation
Soil Sample Analytical Results

Table 1-4. PFAS Soil Sample Analytical Results

Detected Parameters[1]	Unrestricted Use[2]	Industrial Use[3]	Protection of Groundwater[4]	Sample ID:	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	MW-07	MW-08	EW-01	EW-02	EW-03	EW-04	SS-01	SS-02
				Sample Depth:	11-12'	11-12'	9-10'	13-14'	12-13'	10-13'	10'	14-15'	13-14'	12-14'	9-10'	13-14'	0-2"	0-2"
				Sample Date:	2/17/2021	2/23/2021	3/1/2021	2/25/2021	2/26/2021	2/15/2021	2/16/2021	2/23/2021	2/26/2021	2/26/2021	2/24/2021	2/24/2021	3/3/2021	3/3/2021
Perfluoroalkyl Sulfonic Acids (PFSAs)																		
Perfluorobutane sulfonic acid (PFBS)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluorohexane sulfonic acid (PFHxS)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluorooctane sulfonic acid (PFOS)[x]	880,000	4.00E+08	3.70E+06	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	**4.50**	NA
Perfluorodecane sulfonic acid (PFDS)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluoroalkyl Carboxylic Acids (PFCAs)																		
Perfluorobutanoic acid (PFBA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.10	NA
Perfluoropentanoic acid (PFPeA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.10	NA
Perfluorohexanoic acid (PFHxA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	**0.43**	NA
Perfluoroheptanoic acid (PFHpA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	**0.32**	NA
Perfluorooctanoic acid (PFOA)[x]	660,000	6.00E+08	1.10E+06	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	**1.40**	NA
Perfluorononanoic acid (PFNA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluorodecanoic acid (PFDA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluoroundecanoic acid (PFUnDA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluorododecanoic acid (PFDoDA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluorotridecanoic acid (PFTrDA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluorotetradecanoic acid (PFTeDA)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
Perfluoroalkyl Sulfonamido Substances																		
Perfluorooctane sulfonamide (FOSA)	--	--	--	ppt	NA	NA	NA	**0.10 J**	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
N-Methyl perfluorooctane sulfonamidoacetic acid	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
N-Ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
n:2 Fluorotelomer Sulfonic Acids (n:2 FTSAs)																		
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	--	--	--	ppt	NA	NA	NA	< 1.10	NA	NA	NA	NA	NA	NA	NA	< 1.10	< 1.30	NA

Notes

1 – Results compared to *'6 NYCRR Part 375 Environmental Remedial Programs'* Soil Cleanup Objectives (SCOs)

2 – Table 6.8(a) Unrestricted Use SCOs

3 – Table 6.8(b) Restricted Use SCOs: Industrial Use

4 – Table 6.8(b) Restricted Use SCOs: Protection of Groundwater

x : NYSDEC Guidance Value

ppt: Parts per trillion

< : Results not detected above minimum laboratory quantitation limit

	Results exceed Unrestricted Use SCOs
	Results exceed Industrial Use SCOs
*	Results exceed Protection of Groundwater SCOs

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Jay-Hague Site (#C828216)
485 Hague Street
City of Rochester
Monroe County, New York

Health and Safety Plan

Prepared for:

Jay Hague Properties, LLC
12 Walnut Hill Drive
Penfield, New York 14526

Prepared By:

339 East Avenue, Suite 200
Rochester, NY 14604

June 2022

Project No. 50380

Table of Contents

Appendicies

A. General Information

Project Title:	IRM Implementation	**Project No.**	50380-01
Project Manager:	Greg Andrus		
Location:	485 Hague Street Rochester, New York, Monroe County		
Prepared By:	Ben Seifert	**Date Prepared:**	06/17/2022
		Date Revised:	
Approved By:		**Date Approved:**	
Site Safety Officer Review:	Ben Seifert	**Date Reviewed:**	

Site Description/Unusual Features

The Site is located at 485 Hague Street in a suburban area of the City of Rochester, New York at the northwest corner of the intersection of Jay and Hague Streets. The Site is comprised of approximately 1.36 acres, and is listed as parcel 105.80-1-13.001, which consists of 485 Hague Street and a rectangular portion of a parcel formerly listed as part of 1030 Jay Street (acquired in 2009). The Site is zoned for industrial use and is comprised of one (1) 1-story building and one (1) 2-story building. Both buildings are occupied by Woerner Industries, LLC and are utilized for furniture manufacturing.

Based on a review of information collected from previous investigations, the following was found:

- The Site has been occupied by Woerner Industries Inc. (later Woerner Industries, LLC), since the 1970s.
- Records indicate the Site has historically been utilized as a machine shop, metal stamping and fabrication shop, tool manufacturing operation, and furniture manufacturing facility.
- The Site has been subject to several limited subsurface investigations identifying noted contaminants of concern (COC). Contaminants detected in environmental media (e.g. soil, groundwater, and soil vapor) on Site, including tetrachloroethene (PCE) and its degradation products, are presumably related to historical operations.

During the Remedial Investigation (RI) of the Site, Lu Engineers identified polycyclic aromatic hydrocarbons (PAHs) in surface soils at concentrations exceeding Industrial Use Soil Cleanup Objectives (SCOs). Lu Engineers intends to install a soil cover system as an Interim Remedial Measure (IRM) to mitigate surface soil exceedances.

Scope/Objective of Work

IRM implementation will consist of the following:

- Pre-IRM utility stakeout
- Soft (pneumatic/vacuum) excavation and disposal of impacted surface soils

- Demarcation barrier placement (i.e. synthetic fencing material)
- Importation and installation of certified clean fill (i.e. washed, crushed stone and/or topsoil)
- Surface restoration (i.e. re-grading, re-seeding/mulching as necessary)

Implementation of the above tasks will mitigate the risk of human health and exposure to documented PAHs.

Proposed Date of Field Activities: Summer 2022

Background Information:

[X] Complete [ ] Preliminary

Overall Chemical Hazard:

[ ] Serious [ ] Moderate
[X] Low [ ] Unknown

Overall Physical Hazard:

[ ] Serious [ ] Moderate
[X] Low [ ] Unknown

B. Site/Waste Characteristics

Waste Type(s):

[ ] Liquid [X] Solid [ ] Sludge [ ] Gas/Vapor

Characteristic(s):

[ ] Flammable/Ignitable [X] Volatile [ ] Corrosive [X] Acutely Toxic
[ ] Explosive [ ] Reactive [X] Carcinogen [ ] Radioactive
[ ] Other: _____

Physical Hazard(s):

[X] Overhead [ ] Confined Space [ ] Below Grade [X] Trip/Fall
[X] Puncture [ ] Burn [X] Cut [ ] Splash
[X] Noise [X] Other: Underground/overhead utilities

Locations of Chemicals/Waste

Surface soils within landscaped areas along the eastern façades of the existing Site buildings.

Estimated Volume of Chemicals/Wastes:

The quantity of surface soils to be removed as part of the IRM is estimated at 30-cubic yards.

Site Currently in Operation:

[X] Yes [ ] No [ ] Not Applicable

C. Hazard Evaluation

Physical Hazard Evaluation		
Task	**Hazard(s)**	**Hazard Prevention**
All	General physical hazards associated with drill rig and geoprobe operations (spinner augers, overhead equipment, noise, and drill rig movement).	Hard hats, eye protection, and steel-toed boots required at all times while working around drill rig. Hearing protection required during sampling (hammering). Keep safe distance from rig and all moving parts.
	Contact with or inhalation of contaminants, potentially in high concentration in sampling media and/or fire and explosion	To minimize exposure to chemical contaminants, a thorough review of suspected contaminants should be completed and implementation of an adequate protection program.
	Back strain and muscle fatigue due to lifting	Use proper lifting techniques to prevent back strain.
	Heat stress/ cold stress exposure	Implement heat stress management techniques such as shifting work hours, increasing fluid intake, and monitoring employees**.** See Appendix A**.**
	Slip/ tripping/ overhead/ fall	Observe terrain and drilling equipment while walking to minimize slips and falls. Steel-toed boots provide additional support and stability. Use adequate lighting. Wear hard hat. Inspect all lifting equipment prior to use.
	Utility Lines	Identify location(s) prior to work, maintain 25 foot minimum distance to overhead utilities.
	Weather Extremes	Establish Site-specific contingencies for severe weather situations. Discontinue work in severe weather.
	Native wildlife presents the possibility of insect bites and associated diseases.	Avoid wildlife when possible. Use insect repellant.

Basic health and safety protection (steel-toed boots, work clothes, and safety glasses or goggles) will be worn by all personnel at all times. Snakes, insects, and other endemic wildlife should be avoided at all times. Any encounters that result in bites or scratches should be reported to the Site Safety Officer immediately. All allergies should be reported to the Site Safety Officer prior to the start of the project.

Chemical Hazard Evaluation

Compound	PEL	REL	TLV	Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Description	Ionization Potential (eV)
Benzo(a)pyrene	0.2	0.1	--	Y	Inh, Ing, Abs, Con	Skin rash, a burning feeling, skin color changes, warts, and bronchitis.	Aromatic hydrocarbon consisting of five fused benzene rings and formed during the incomplete combustion of organic matter. Faint aromatic odor; reasonably anticipated to be a human carcinogen.	70
Benzo(b)fluoranthene	--	--	--	--	Inh, Ing, Abs, Con	--		70
Chrysene	0.2	0.1	--	Y	Inh, Ing, Abs, Con	Irritation to skin, eyes, nose, and throat. Coughing/wheezing.	Colorless, white, crystalline solid formed during the incomplete combustion of organic matter. Probable carcinogen in humans.	120
Benzo(a)anthracene	0.2	0.1	--	--	Inh, Ing, Abs, Con	--	Odorless, colorless to yellow/brown powder formed during the incomplete combustion of organic matter. Probable carcinogen in humans.	70
Indeno(1,2,3-cd)pyrene	--	--	--	--	Inh, Ing, Abs, Con	--	Odorless, colorless to yellow/brown powder formed during the incomplete combustion of organic matter. Probable carcinogen in humans.	120
Benzo(k)fluoranthene	--	--	--	Y	Inh, Ing, Abs, Con	Irritation to the skin and eyes.	Pale yellow aromatic hydrocarbon consisting of five fused rings and is produced by the incomplete combustion of organic matter. Probable carcinogen in humans.	70
Dibenz(a,h)anthracene	--	--	--	Y	Inh, Ing, Abs, Con	Irritation to skin, eyes, nose, and throat. Coughing/wheezing, headache, dizziness, nausea and vomiting.	Colorless, white, or light yellow crystalline solid. Probable carcinogen in humans.	--
Phenol	19	19	19	Y	Inh, Ing, Abs, Con	Irritation to skin, eyes, nose, and throat. Coughing/wheezing, headache, dizziness, nausea and vomiting.	Colorless, white, or light yellow crystalline solid	8.5

KEY:

PEL = Permissible Exposure Limit (mg/m^3)
REL = Recommended Exposure Limit (mg/m^3)
--- = Information not available
TLV = Threshold Limit Value (ACGIH)

Inh = Inhalation
Ing = Ingestion
mg/m^3 = Milligrams per cubic meter
* = Chemical is a known or suspected carcinogen

Abs = Skin Absorption
Con = Skin and/or eye Contact
ppm = Parts per million
sk = Skin notation

D. Site Safety Work Plan

Site Control:

	Yes	No		Yes	No
Perimeter Identified:	[X]	[ ]	Site Secured:	[X]	[ ]
Work Areas Designated:	[X]	[ ]	Zones of Contamination Identified:	[X]	[ ]

Anticipated Level of PPE:

Level A	Level B	Level C	Level D
--	--	(Available)	[X]

All Site work will be performed at Level D (steel-toed boots, work clothes, eye protection, gloves and hard hats) unless monitoring indicates otherwise. Gloves will be worn if contact with Site soil, sludge or water is anticipated. Level C will be available and used when indicated by sustained PID readings of 25 ppm or greater above ambient air.

Air Monitoring:
Lu Engineers will conduct air monitoring in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP), as well as a Special Requirements CAMP, which are included in Attachment C of the RIWP. Monitoring at the site will include volatile organic compounds (VOCs) and particulates monitoring with instrumentation, and visual monitoring of fugitive dust migration.

Particulate monitoring will take place on a continuous basis, and locations will vary according to wind direction. Upwind and downwind monitoring station locations will be adjusted to accommodate wind changes and re-establish baseline levels. Particulate readings will be taken with an instrument that can measure particulate matter less than 10 micrometers in size (PM-10) and be capable of real-time monitoring. The particulate monitoring equipment will have an audible alarm to indicate when action levels have been exceeded. In addition to particulate monitoring with instrumentation, fugitive dust migration will be visually assessed during all work activities.

VOC monitoring locations will vary according to wind direction; the upwind location will be determined at the start of each work day and a VOC reading taken. Should wind direction change, another reading will be taken at a new upwind location to establish baseline levels. The downwind measurement will be taken at the downwind perimeter of the work area.

The following table summarizes s air monitoring requirements and frequency.

Contaminant	Monitoring Device	Frequency
Organic Vapors	PID	Continuous
Ignition Sources	O^2/Explosimeter	Continuous
Particulate	TSI DustTrak™ or equivalent	Continuous

CAMP data summary will be provided to NYSDOH on a weekly basis at a minimum. The NYSDEC and NYSDOH will be notified immediately of any CAMP exceedances and corrective actions taken.

Work Zone Action Levels:

PID readings of 1 to 25 ppm above background at breathing zone and sustained for 1 minute
ACTION: Halt work to let vapors dissipate, continuous air monitoring.

PID readings 25 to 50 ppm above background at breathing zone and sustained for 1 minute
ACTION: Upgrade to Level C, continuous air monitoring.

PID readings **> 50ppm** above background at breathing zone and sustained for 1 minute
ACTION: Stop work, evacuate work zone and evaluate with continuous air monitoring.

O2 readings must remain between 19.5% and 22.0%. Explosivity must be above 10% LEL. The area must be evacuated, and ignition sources eliminated if levels are not within their standard.

Decontamination Solutions and Procedures for Equipment, Sampling Gear, etc.:
Disposable sampling equipment will be used where possible. If decontamination is necessary, distilled, or deionized water and Alconox (or equivalent) will be used. A 10% nitric acid rinse will be added if metals sampling is to be conducted.

Sampling Handling Procedures Including Protective Wear:
All sample handling will be performed while wearing nitrile gloves. To minimize hazards to lab personnel, sample volumes will be no larger than necessary, and the outside of all sample containers will be wiped clean prior to being relinquished.

Personnel Decontamination Protocol:
Soap, water and paper towels will be available for all personnel and will be used before eating, drinking or leaving the Site. Disposable PPE will be double bagged and disposed of as non-hazardous waste unless PCBs are detected.

Work Limitations (time of day, weather conditions, etc.) and Heat/Cold Stress Requirements:
All work will be completed during daylights hours. Severe inclement weather may be cause to suspend outdoor activities. Cold/heat stress protocol will dictate work/rest regimen. Heavy equipment will not be used during electrical storms. No transfer of materials can be conducted outside of normal working hours.

E. Training Requirements

All personnel conducting field activities on-Site are required to have completed training sessions in accordance with Occupational Safety and Health Administration (OSHA) for Parts 1926 and 1910 (Title 29 Code of Federal Regulations [CFR] Part 1926.65 and Part 1910.120 - Hazardous Waste Operations and Emergency Response- 'HazWOPER'). This training shall consist of a minimum of 40 hours of instruction off-Site and three days of actual field experience under the direct supervision of a trained, experienced supervisor. Each employer will maintain documentation stating that its on-Site personnel have complied with this regulation.

In addition, each employee PPE worn by each employee will be in compliance with OSHA Parts 1910.132-140. Also, if respirator use is required, each employee needed to wear a respirator will be in compliance with OSHA Respiratory Protection standards Part 1910.134.

All personnel will have reviewed this HASP and received a Site-specific health and safety briefing prior to participating in field work.

All visitors entering the work area must review the HASP and be equipped with the proper PPE. All Site personnel and visitors shall sign the last page of the HASP as an acknowledgement that they have read and understand the Site health and safety requirements.

Team Member*	Responsibility
Greg Andrus	Project Manager
Ben Seifert	Environmental Project Scientist and Field Team Leader
Klajdi Macolli	Environmental Project Scientist
Janet Bissi	Environmental Field Technician

* All Lu Engineers field staff participate in a medical monitoring program and have completed applicable training per 29CFR 1910.120. Respiratory protection program meets requirements of 29CFR 1910.134.

Special Site Equipment, Facilities or Procedures
Personnel will be required to maintain the Buddy System when entering and working on-Site. All parties will be required to attend an on-Site briefing, which will identify the roles of each organization's personnel and will integrate emergency procedures for all Site participants. Sanitary Facilities and Lighting Must Meet 29 CFR 1910.120

Site Entry Procedures and Special Considerations:
Lu Engineers Technical Staff will be required to adhere to this HASP. Special requirements by the Construction Contractor will be addressed during project commencement at an on-Site briefing, which will identify the roles of each organization's personnel and will integrate emergency procedures for all Site participants.

Accident and Injury Reporting
Any work-related incident, accident, injury, illness, exposure, or property loss must be reported to the project manager. This includes:

- Accident, injury, illness, or exposure of an employee;
- Injury of a subcontractor;
- Damage, loss, or theft of property, and/or;
- Any motor vehicle accident regardless of fault, which involves a company vehicle, rental vehicle, or personal vehicle while employee is acting in the course of employment.

F. COVID-19 Precautions

Coronavirus Disease 2019 (COVID-19) is a respiratory disease caused by the SARS-CoV-2 virus. Due to the spread of this virus and the containment efforts taken by public health and government officials, the following interim Health & Safety protocols outlined in this section are to be implemented across all offices, field offices and project sites. Additional, updated information on COVID-19 can be found at the CDC website: https://www.cdc.gov/coronavirus/2019-ncov/community/index.html.

Transmission
Both COVID-19 and the flu can be spread from person to person through droplets caused by an infected person coughing, sneezing, or talking. Flu can be spread by an infected person for several days before their symptoms appear, and COVID-19 is believed to be spread in the same manner.

Symptoms
The following symptoms may appear 2 to 14 days after exposure:

- Fever
- Cough
- Difficulty breathing and/or shortness of breath
- Chest pain/pressure

Seek direction from your medical provider and inform the project manager and site safety officer as soon as possible. Employees shall notify the project manager and site safety officer immediately should you suspect or find yourself/someone presenting symptoms.

Basic Practices
Lu Engineers employees and contractors will be diligent about performing the following basic practices to mitigate the spread of COVID-19:

- Maintain social distancing (minimum of 6 feet) and avoid close contact with all workers and people and wear an M-90 or equivalent facemask when working with others.
- Wear proper mask/face covering
- Wash your hands frequently to help protect yourself and others from the spread of germs.
- Cover your mouth and nose with a tissue when coughing or sneezing.
- Avoid touching your eyes, nose, and mouth.
- Avoid the sharing of food or leaving food available for others to consume.
- Remain up to date with current guidance for gatherings and meetings.
- Remain isolated and call or email the site safety officer if you are feeling sick.
- If you have fever, cough and difficulty breathing, seek medical care early.

All employees are required to utilize prevention practices and strategies to reduce their chances of contracting the virus.

G. Emergency Information

Local Resources:

Ambulance:	911
Hospital Emergency Room:	Highland Hospital 1000 South Ave, Rochester, NY 14620
Poison Control Center:	911

Police (include local, county sheriff, state): 911

Fire Department: 911

Airport: N/A

Local Laboratory: N/A

UPS/Federal Express: N/A

Site Resources:

Site Emergency Evaluation Alarm Method: Sound vehicle horn.

Water Supply Source: Gallons of water will be available in vehicles.

Telephone Location, Number: None available

Cellular Phone, if Available: None available

Radio: TBD

Other: TBD

Emergency Contacts:

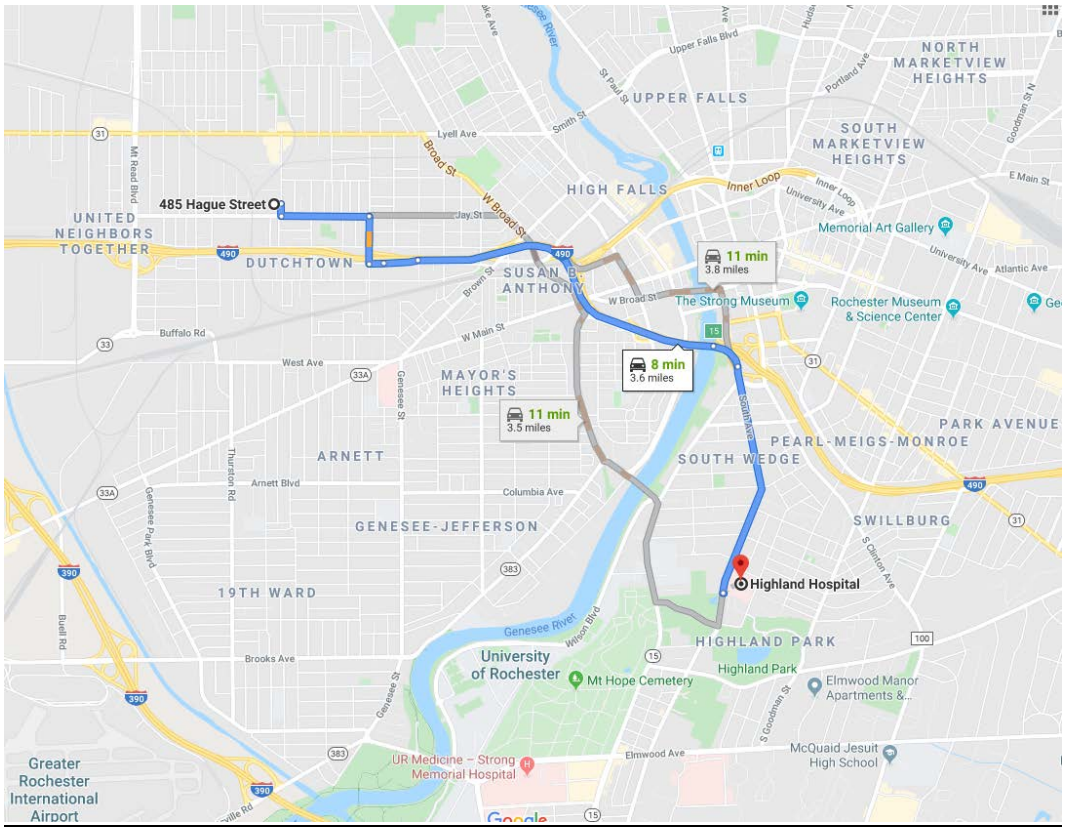
Fire/Police Department: 911

Lu Engineers' Safety Director: (585) 385-7417

Emergency Routes

Field team must know route(s) prior to start of work.

Directions from the Site to the hospital:



Head south on Hague Street towards Jay Street. Head east on Jay Street for 0.4 miles. Head south onto Child Street for 0.2 miles before merging on-ramp for I-490 E. Merge onto I-490 E and continue for 2.7 miles. Take exit 15 for NY-15 and merge onto South Avenue. Continue on South Avenue for 1 mile before turning east onto Bellevue Drive. The destination will be directly ahead.

On-Site Assembly Area: At Site entry point .

Emergency egress routes to get off-Site: N/A .

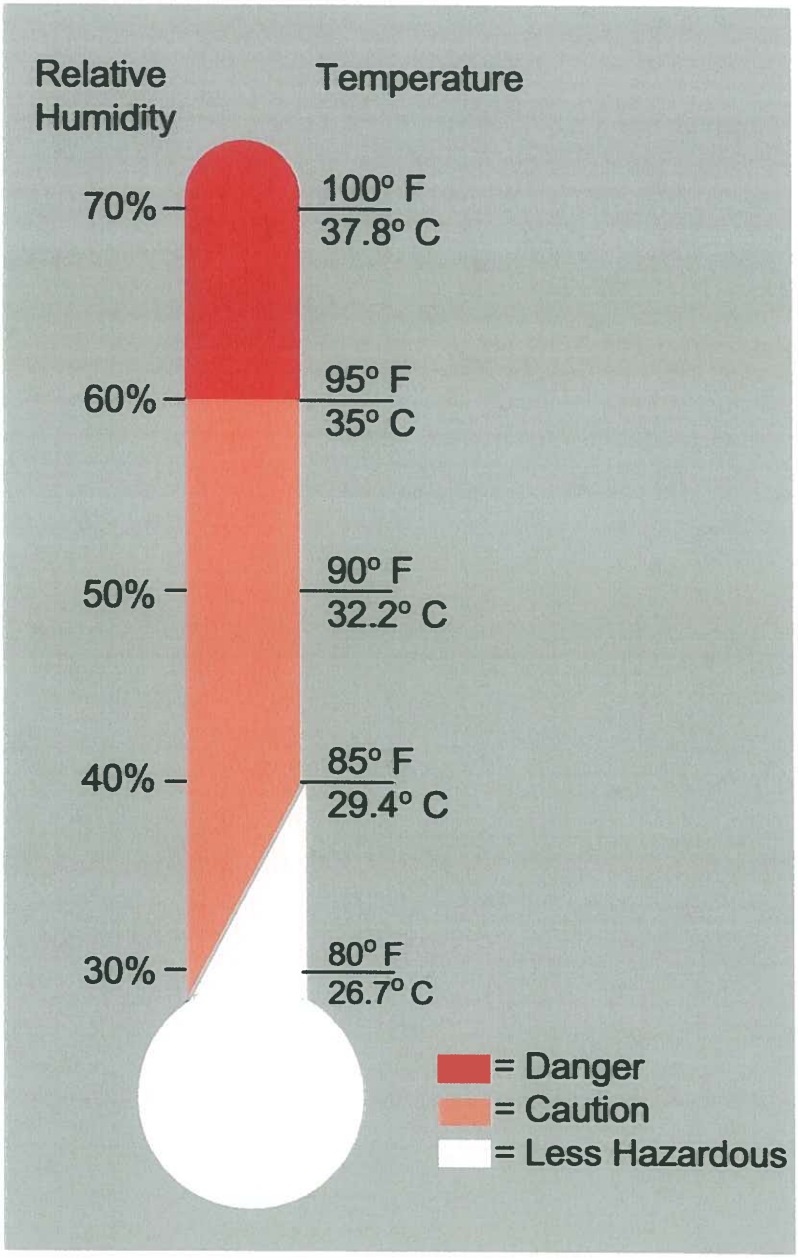
APPENDIX A

HEAT STRESS AND COLD EXPOSURE

THE HEAT EQUATION

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are **heat exhaustion** and **heat stroke**. If actions are not taken to treat heat exhaustion, the illness could progress to heat stroke and possible **death**.



U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 3154
1998

HEAT EXHAUSTION

What Happens to the Body:

HEADACHES, DIZZINESS/LIGHT HEADEDNESS, WEAKNESS, MOOD CHANGES (irritable, or confused/can't think straight), FEELING SICK TO YOUR STOMACH, VOMITING/THROWING UP, DECREASED and DARK COLORED URINE, FAINTING/PASSING OUT, and PALE CLAMMY SKIN.

What Should Be Done:

- Move the person to a cool shaded area to rest. Don't leave the person alone. If the person is dizzy or light headed, lay them on their back and raise their legs about 6-8 inches. If the person is sick to their stomach lay them on their side.
- Loosen and remove any heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if they are not feeling sick to their stomach.
- Try to cool the person by fanning them. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (Ambulance or Call 911).

(If heat exhaustion is not treated, the illness may advance to heat stroke.)

HEAT STROKE—A MEDICAL EMERGENCY

What Happens to the Body:

DRY PALE SKIN (no sweating), HOT RED SKIN (looks like a sunburn), MOOD CHANGES (irritable, confused/not making any sense), SEIZURES/FITS, and COLLAPSE/PASSED OUT (will not respond).

What Should Be Done:

- Call for emergency help (Ambulance or Call 911).
- Move the person to a cool shaded area. Don't leave the person alone. Lay them on their back and if the person is having seizures/fits remove any objects close to them so they won't strike against them. If the person is sick to their stomach lay them on their side.
- Remove any heavy and outer clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if they are alert enough to drink anything and not feeling sick to their stomach.
- Try to cool the person by fanning them. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs under the arm pits and groin area.

How to Protect Workers

- Learn the signs and symptoms of heat-induced illnesses and what to do to help the worker.
- Train the workforce about heat-induced illnesses.
- Perform the heaviest work in the coolest part of the day.
- Slowly build up tolerance to the heat and the work activity (usually takes up to 2 weeks).
- Use the buddy system (work in pairs).
- Drink plenty of cool water (one small cup every 15-20 minutes)
- Wear light, loose-fitting, breathable (like cotton) clothing.
- Take frequent short breaks in cool shaded areas (allow your body to cool down).
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages (these beverages make the body lose water and increase the risk for heat illnesses).

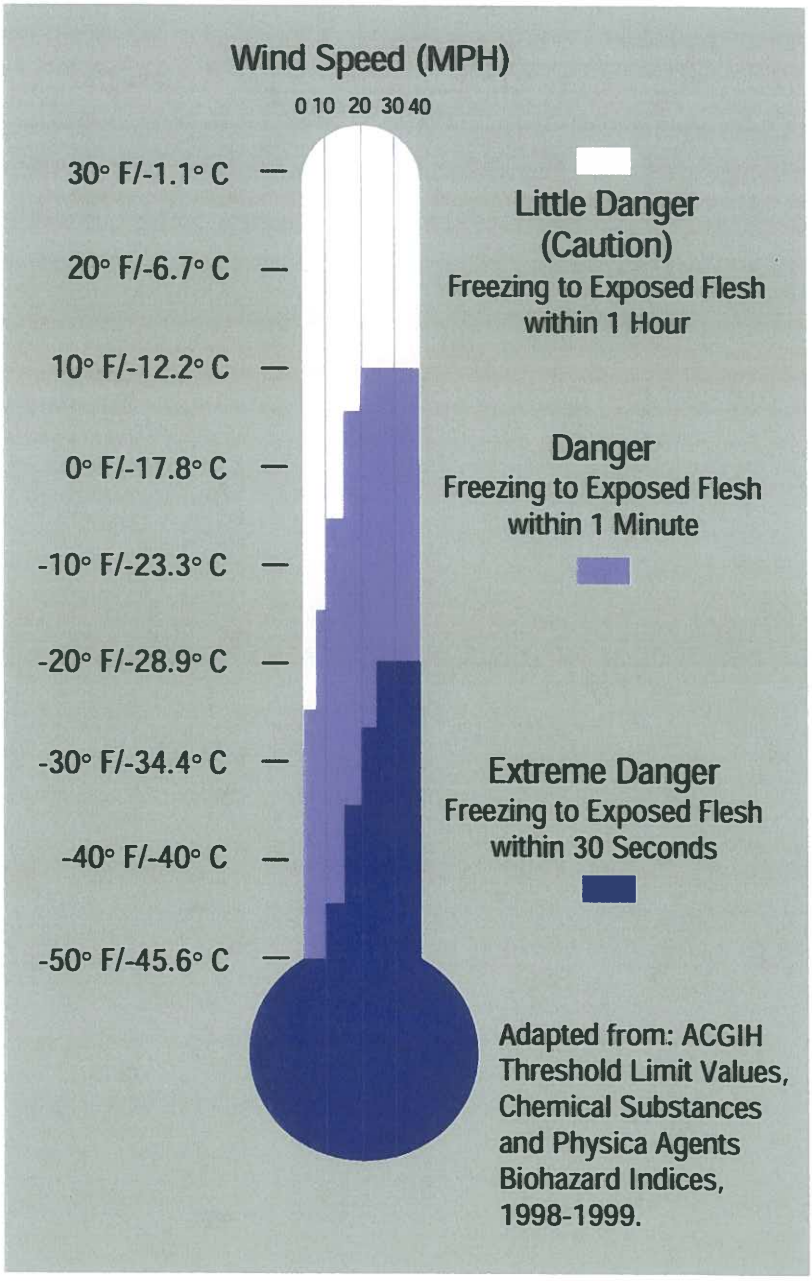
Workers Are at Increased Risk When

- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you when working in hot environments).
- They have had a heat-induced illness in the past.
- They wear personal protective equipment (like respirators or suits).

THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. **Hypothermia** can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/ 37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 3156
1998

FROST BITE

What Happens to the Body:

FREEZING IN DEEP LAYERS OF SKIN AND TISSUE; PALE, WAXY-WHITE SKIN COLOR; SKIN BECOMES HARD and NUMB; USUALLY AFFECTS THE FINGERS, HANDS, TOES, FEET, EARS, and NOSE.

What Should Be Done: (land temperatures)

- Move the person to a warm dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- **DO NOT** rub the affected area, because rubbing causes damage to the skin and tissue.
- **Gently** place the affected area in a warm (105°F) water bath and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **NOTE:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

HYPOTHERMIA - (Medical Emergency)

What Happens to the Body:

NORMAL BODY TEMPERATURE (98.6° F/37°C) DROPS TO OR BELOW 95°F (35° C); FATIGUE OR DROWSINESS; UNCONTROLLED SHIVERING; COOL BLUISH SKIN; SLURRED SPEECH; CLUMSY MOVEMENTS; IRRITABLE, IRRATIONAL OR CONFUSED BEHAVIOR.

What Should Be Done: (land temperatures)

- Call for emergency help (i.e., Ambulance or Call 911).
- Move the person to a warm, dry area. Don't leave the person alone. Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if they are alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) or alcohol.
- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck, and head areas. **DO NOT** rub the person's body or place them in warm water bath. This may stop their heart.

What Should Be Done: (water temperatures)

- Call for emergency help (Ambulance or Call 911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses the body's heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train the workforce about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Take frequent short breaks in warm dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs).
- Drink warm, sweet beverages (sugar water, sports-type drinks). Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers Are at Increased Risk When...

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you while working in cold environments).
- They are in poor physical condition, have a poor diet, or are older.

APPENDIX B

ADDITIONAL POTENTIAL PHYSICAL AND CHEMICAL HAZARDS

ADDITIONAL POTENTIAL PHYSICAL AND CHEMICAL HAZARDS	
POTENTIAL PHYSICAL HAZARDS	**CONTROL METHODS**
Overhead Hazards/Falling Objects	Overhead hazards will be identified prior to each task (i.e., inspecting drill rig mast, building structure). Hard hats will be required for each task that poses an overhead hazard.
Contact with Utilities	Prior to initiating Site activities, all utilities will be located by the appropriate utility company and will be marked and/or barricaded to minimize the potential of accidental contact. A minimum distance of 10 feet between the derrick and overhead power lines must be maintained at all times.
Noise Exposure	Areas of potentially high sound pressure levels (>85 dBA) will be restricted to authorized personnel only. Engineering controls will be used to the extent possible. Hearing protection will be made available to all workers on-Site. Exposure to time-weighted average levels in excess of 85 dBA is not anticipated.
POTENTIAL CHEMICAL HAZARDS	**GENERAL CONTROL METHODS**
Contaminant Inhalation	Direct reading instruments will be used to monitor airborne contaminants. Established Lu Engineers' action levels will limit exposure to safe levels. Respiratory protection will be used as appropriate.
Contaminant Ingestion	Standard safety procedures such as restricting eating, drinking, and smoking to the support zone and utilizing proper personal decontamination procedures will minimize ingestion as a potential route of exposure.
Dermal Contaminant Contact	The proper selection and use of personal protective clothing and decontamination procedures will minimize dermal contaminant contact.
Potential contact with lower concentration waste and naturally occurring contaminants (i.e., methane)	Dermal contact with contaminants will be minimized by proper use of the following PPE: • Tyvex coveralls • Neoprene gloves • Booties (latex) or over-boots.
Contact with or inhalation of decontamination solutions.	Material Safety Data Sheets for all decon solutions. First aid equipment available. **See Appendix C.**

APPENDIX C

EQUIPMENT CHECKLIST

EQUIPMENT CHECKLIST

PROTECTIVE GEAR			
LEVEL A	**N/A**	**LEVEL B**	**N/A**
SCBA		SCBA	
SPARE AIR TANKS		SPARE AIR TANKS	
ENCAPSULATING SUITE		PROTECTIVE COVERALL	
SURGICAL GLOVES		RAIN SUIT	
NEOPRENE SAFETY BOOTS		BUTYL APRON	
BOOTIES		SURGICAL GLOVES	
GLOVES		GLOVES	
OUTER WORK GLOVES		OUTER WORK GLOVES	
HARD HAT		NEOPRENE SAFETY BOOTS	
CASCADE SYSTEM		BOOTIES	
5-MINUTE COOLING VEST		HARD HAT WITH FACE SHIELD	
		CASCADE SYSTEM	
		MANIFOLD SYSTEM	
LEVEL C		**LEVEL D**	
ULTRA-TWIN RESPIRATOR		NEOPRENE SAFETY BOOTS	
POWER AIR PURIFYING RESPIRATOR		BOOTIES (available)	
CARTRIDGES		NITRILE	
5-MINUTE ESCAPE MASK		HARD HAT WITH FACE SHIELD (available)	
PROTECTIVE COVERALL		SAFETY GLASSES	X
RAIN SUIT	X	GLOVES	X
BUTYL APRON		WORK GLOVES (available)	X
SURGICAL GLOVES		SAFETY BOOTS	X
GLOVES	X	BLAZE ORANGE VEST	
OUTER WORK GLOVES	X	TICK/CHIGGER GATORS	
NEOPRENE SAFETY BOOTS		HEARING PROTECTION	x
HARD HAT WITH FACE SHIELD			
BOOTIES			
HARD HAT	X		

EQUIPMENT CHECKLIST

INSTRUMENTATION	NO.	**FIRST AID EQUIPMENT**	NO.
THERMAL DESORBER		FIRST AID KIT	X
O_2/EXPLOSIMETER W/CAL.KIT (Drilling)		OXYGEN ADMINISTRATOR	
PID (10.2 eV lamp)	X	STRETCHER	
MAGNETOMETER		PORTABLE EYE WASH	
PIPE LOCATOR		BLOOD PRESSURE MONITOR	
WEATHER STATION		FIRE EXTINGUISHER	X
DRAEGER PUMP, TUBES			
BRUNTON COMPASS		**DECON EQUIPMENT**	
MONITOX CYANIDE		WASH TUBS	
HEAT STRESS MONITOR		BUCKETS	X
NOISE EQUIPMENT		SCRUB BRUSHES	X
PERSONAL SAMPLING PUMPS		PRESSURIZED SPRAYER	
Dust Trek (Particulates) (Drilling)	X	DETERGENT (Type: Alconox) = TSP	X
		SOLVENT (HEXANE)	
		PLASTIC SHEETING	
RADIATION EQUIPMENT		TARPS AND POLES	
DOCUMENTATION FORMS		TRASH BAGS	X
PORTABLE RATEMETER		TRASH CANS	
SCALER/RATEMETER		MASKING TAPE	
NaI Probe		DUCT TAPE	X
ZnS Probe		PAPER TOWELS	X
GM Pancake Probe		FACE MASK	
GM Side Window Probe		FACE MASK SANITIZER	
MICRO R METER		FOLDING CHAIRS	
ION CHAMBER		STEP LADDERS	
ALERT DOSIMETER		DISTILLED WATER	X
MINI-RAD			

EQUIPMENT CHECKLIST

SAMPLING EQUIPMENT	NO.	MISCELLANEOUS (cont.)	NO.
4-OZ BOTTLES	X	BUNG WRENCH	X
1 LITER AMBER BOTTLES		SOIL AUGER	
VOA BOTTLES		PICK	
SOIL SAMPLING (CORING) TOOL		SHOVEL	X
SOIL VAPOR PROBE		CATALYTIC HEATER	
THIEVING RODS WITH BULBS		PROPANE GAS	
SPOONS		BANNER TAPE	X
GENERAL TOOL KIT		SURVEYING METER STICK	
FILTER PAPER		CHAINING PINS AND RING	
PERSONAL SAMPLING PUMP SUPPLIES		TABLES	
4-OZ JARS	X	WEATHER RADIO	
		BINOCULARS	
VEHICLE EQUIPMENT		MEGAPHONE	
TOOL KIT	X	PORTABLE RADIOS (4)	
HYDRAULIC JACK		CELL PHONE	X
LUG WRENCH		CAMERA	X
TOW CHAIN		HEARING PROTECTION	X
VAN CHECK OUT			
GAS	X	**SHIPPING EQUIPMENT**	
OIL	X	COOLERS	X
ANTIFREEZE		PAINT CANS WITH LIDS, 7 CMIPS EACH	
BATTERY		VERMICULITE	
WINDSHIELD WASH	X	SHIPPING LABELS	X
TIRE PRESSURE		DOT LABELS: “DANGER”, “UP”;	
		“INSIDE CONTAINER COMPLIES...”;	
MISCELLANEOUS		“HAZARD GROUP”	
PITCHER PUMP		STRAPPING TAPE	
SURVEYOR’S TAPE		BOTTLE LABELS	X
100 FIBERGLASS TAPE	X	BAGGIES	X
300 NYLON ROPE		CUSTODY SEALS	X
NYLON STRING		CHAIN-OF-CUSTODY FORMS	X
SURVEYING FLAGS		FEDERAL EXPRESS FORMS	X
FILM		CLEAR PACKING TAPE	X
WHEELBARROW			

APPENDIX D

CAMP REQUIREMENTS

Appendix 1A
New York State Department of Health
Generic 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.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

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. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

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. 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^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 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^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 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.

December 2009

ATTACHMENT 1: SPECIAL REQUIREMENTS CAMP

Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative- pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3 (micrograms per cubic meter), work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Special Requirements for Indoor Work With Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under “Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

Jay-Hague Site (#C828216)
485 Hague Street
City of Rochester
Monroe County, New York

Quality Assurance Project Plan

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June 2022

Table of Contents

1.0 Introduction

This Quality Assurance Project Plan (QAPP) was prepared as part of the Interim Remedial Measure (IRM) Work Plan for the Jay Hague Site and is subject to the review and approval by the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH). The project work will be performed by Lu Engineers and conducted under their direction by NYSDEC-approved contractors.

This QAPP presents the policies, organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) activities that will be implemented by Lu Engineers for this project. This QAPP is designed to ensure that all technical data generated by Lu Engineers is accurate, representative, and will ultimately withstand judicial scrutiny.

All QA/QC procedures are implemented in accordance with applicable professional technical standards, NYSDEC and Environmental Protection Agency (EPA) requirements, government regulations and guidelines, and specific project goals and requirements. This QAPP is prepared in accordance with all NYSDEC and EPA QAPP guidance documents.

This QAPP incorporates the following activities:

- Sample Management and chain of custody;
- Document control;
- Laboratory quality control; and
- Review of project deliverables.

Analytical samples will be collected in the field utilizing standard operating procedures (SOPs) and sent to the contracted (NYSDOH) Environmental Laboratory Approval Program (ELAP) CLP-certified laboratory for analysis. Field data compilation, tabulation, and analysis will be checked for accuracy. Calculations and other post-field tasks will be reviewed by field personnel and the project manager.

Equipment used to take field measurements will be maintained and calibrated in accordance with established procedures. Records of calibration and maintenance will be kept by assigned personnel. Field testing and data acquisition will be performed in standard fashion following strict guidelines.

Document control procedures will be used to coordinate the distribution, coding, storage, retrieval, and review of all data collected during all sampling tasks.

In addition, the project laboratory has developed SOPs for individual analytical methods and internal QC procedures. These documents are an important aspect of their QA program and are available for review upon request.

2.0 Project Objectives

The intent of this IRM is to construct a soil cover system to address polycyclic aromatic hydrocarbon (PAH) impacts to surface soils along the eastern edge of the Site.

3.0 Project Organization and Responsibility

In accordance with Lu Engineers' QA program, experienced senior technical staff will be assigned to the project QA/QC functions. Our management structure provides for direct and constant operational

responsibility, clear lines of authority, and the integration of QA activities. The various QA functions are explained below.

QA contacts include Lu Engineers project manager and QA Officer.

ALS Environmental, Inc, a NYSDOH ELAP-CLP certified laboratory, will provide analytical services for the project.

Project Manager:
The project manager for this project will be Gregory L. Andrus, P.G. As project manager, Mr. Andrus will be responsible for implementing the project and will have the authority to commit the resources necessary to meet project objectives and requirements. The project manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved. The project manager will provide the major point of contact and control for matters concerning the project. The project manager will:

- Work directly with the NYSDEC Regional Office to complete and implement a work plan for the project;
- Define project objectives and schedule;
- Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task;
- Acquire and apply technical managerial resources as needed to ensure performance within budget and schedule constraints;
- Orient all staff concerning the project's special considerations;
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product;
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness;
- Review and analyze overall task performance with respect to planned requirements and authorizations;
- Approve all external reports (deliverables) before their submission to the client;
- Ultimately be responsible for the preparation and quality of interim and final reports; and
- Represent the project team at meetings.

Quality Assurance Officer (QAO):
The QA officer is Janet Bissi, CHMM. Mrs. Bissi will be responsible for maintaining QA for a specific program and the projects within that program. Specific functions and duties include:

- Providing an external and, thereby, independent QA function to the project;
- Responsibility for field and sampling audits conducted by qualified QA personnel;

- Coordinating with client personnel, Lu Engineers' project manager, laboratory management, and staff to ensure that QA objectives appropriate to the project are set and that personnel are aware of these objectives;
- Coordinating with project management and personnel to ensure that QC procedures appropriate to demonstrating data validity sufficient to meet QA objectives are developed and in place;
- Interfacing with the data validator (if necessary) and development of a project specific data usability report;
- Coordinating with QA personnel to ensure that QC procedures are followed and documented;
- Requiring and/or reviewing corrective actions taken in the event of QC failures;
- Reporting non-conformance with QC criteria or QA objectives, including an assessment of the impact on data quality or project objectives, to the project manager.

Technical Staff:
The technical staff (team members) for this project will be drawn from Lu Engineers pool of resources. The technical team staff will be utilized to gather and analyze data and to prepare various task reports and support materials. All of the designated technical team members are experienced professionals who possess the degree of specialization, training, and technical competence required to effectively and efficiently perform the required work.

Data Validation and QA Staff:
If necessary, data validation and QA staff will include data validation chemists, QA auditors, and other technical specialists who remain independent of the laboratory and project management. The staff will independently validate analytical data to assess and summarize their accuracy, precision, and reliability and determine their usability. The staff will also perform audits and document the historical record of project activities, including any factors affecting data usability, such as data discrepancies and deviations from standard practices. The staff will act under the direction of the QA officer and project manager in accordance with specific project requirements. A third party data validation staff is to be determined.

4.0 Sampling Procedures

4.1 Sampling Design

Sampling during the IRM will be limited to characterization of imported fill to verify clean conditions.

Approximately 30-cubic yards of clean fill will need to be imported to the Site as part of IRM activities. Prior to import, samples will be analyzed for:

- Target Compound List (TCL) Volatile organic compounds (VOCs) by EPA Method 8260;
- Semi-volatile organic compounds (SVOCs (B/N)) by EPA method 8270;
- Resource Conservation and Recovery Acts (RCRA) metals by EPA Method 6010/7473;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082;
- Pesticides/herbicides by EPA Method 8151;

Additional Site characterization sampling is not proposed at this time.

Continuous perimeter and work zone air monitoring for VOCs will also be conducted during all soil removal and staging activities using a photoionization detector (PID) equipped with a 10.2 eV bulb to ensure health and safety of workers and the public.

4.2 Decontamination Procedures

All decontamination will be performed in accordance with NYSDEC-approved procedures. Sampling methods and equipment have been chosen to minimize decontamination requirements and prevent the possibility of cross-contamination.

Decontamination will be conducted using the following procedure:

- Initially cleaning equipment of all foreign matter;
- Scrubbing equipment with brushes in alconox solution;
- Rinsing equipment with distilled water; and
- Rinsing equipment with 10% nitric acid (when sampling for metals only);
- Triple-rinsing equipment with distilled water; and
- Allowing equipment to air dry.

All drill cuttings and water generated during drilling borings will remain on site. All waters generated by decontamination or by sampling monitoring wells will be stored in drums or an onsite holding tank.

4.3 Sample Documentation

4.3.1 Logbooks

All field activities will be documented in a field logbook. This logbook will provide a record of activities conducted at the site. All entries will be signed and dated at the end of each day of fieldwork. The field logbook will include the following: date and time of all entries; names of all personnel on Site; weather conditions (temperature, precipitation, etc.); location of activity; and description of activity.

As with any data logbooks, no pages will be removed for any reason. If corrections are necessary, these must be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside it. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

4.3.2 Sample Identification

All containers of samples collected by Lu Engineers from the project will be identified using a format identified in the field on a label affixed to the sample container (labels are to be covered with Mylar tape). Generally, the format will include two (2) letters identifying the Site, two (2) letters identifying the type of sample, two (2) numbers identifying a sample location, 2-4 additional numbers identifying a sample depth if appropriate, additional letters identifying special parameters (MS/MSD – Matrix Spike, Matrix Spike Duplicate).

Each sample will be labeled and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers and protected with Mylar tape.

The sample label will give the sample number, the date of the collection, analysis required, and pH and preservation, if appropriate.

The laboratory sample number will appear on a barcode label affixed to each sample, extract, or digestate.

4.4 Field Instrumentation

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to manufacturer's guidelines and recommendations. Operation, calibration, and maintenance will be performed by personnel properly trained in these procedures. Documentation of calibration information will be maintained in the appropriate log book or reference file and will be available upon request. Instruments will be calibrated before each use.

5.0 Sample Handling and Custody

This section describes procedures for sample handling and chain-of-custody to be followed by Lu Engineers' sampling personnel and the analytical laboratory. The purpose of these procedures is to ensure that the integrity of the samples is maintained during their collection, transportation, storage, and analysis. All chain-of-custody requirements comply with SOPs indicated in EPA sample-handling protocol.

Sample identification documents will be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include field notebooks, sample labels, custody seals, chain-of-custody records, and laboratory sample log-in and tracking forms.

The primary objective of the chain-of-custody procedures is to provide an accurate written record that can be used to trace the possession and handling of a sample from the moment of collection through analyses. A sample is in custody if it is:

- In someone's physical possession;
- In someone's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

5.1 Sample Containers and Preservation

For sampling performed by Lu Engineers, certified pre-cleaned sample containers obtained from a reliable supplier will be provided by the analytical laboratory. All containers provided by the laboratory are pre-cleaned (Level 1), with certificates of analysis available for each bottle type. Certifications of Analysis provided by the vendor are kept on file by the laboratory.

All samples will be stored on ice pending delivery to the laboratory. In addition, all water samples for volatile analysis will be preserved with HCl to a pH of less than 2. All water samples for metals analysis will be preserved by adding concentrated nitric acid until the sample pH is lowered to 2.0 standard units or less. Sample pH will be checked in the field using indicator paper. A list of preservatives and holding times for each type of analysis is included in the following Table.

Sample Preservation and Holding Times

Sample Matrix	Analysis	Container Type and Size	Preservation	Holding Time
Soil	VOC	2-4 oz. wide mouth glass jar with Teflon-lined cap	Cool to 4°C; zero headspace	14 days
	SVOC	2-4 oz. amber wide mouth glass jar with Teflon-lined cap	Cool to 4°C	14 days
	Metals	8 ox. glass jar	Cool to 4°C	6 months
	PCBs	8 ox. glass jar with Teflon-lined cap	Cool to 4°C	14 days
	PFAS	250-ml container made of HDPE or polypropelene with unlined caps	2-6°C	14 days
	1,4-Dioxane	8 ox. glass jar	Cool to 4°C	7 days

Sample preservation will be verified at the lab immediately prior to extraction, digestion, and/or analysis and the pH will be recorded in the extraction/digestion logbook. The pH may be checked upon arrival, if desired. If the samples are improperly preserved, a QA/QC discrepancy form will be submitted to the lab manager and QA coordinator for appropriate follow-up action (i.e., evaluation of the data during the data validation process and, if necessary, additional instruction of personnel regarding proper procedures).

5.2 Field Custody Procedures

- Sample bottles must be obtained pre-cleaned from the laboratory or directly from an approved retail source. All containers will be prepared in a manner consistent with the NYSDEC ASP 1991 bottle-washing procedures. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- All containers will have assigned lot numbers to ensure traceability through the supplier.
- As few persons as possible should handle samples.
- The sample collector is personally responsible for the care and custody of samples collected until the samples are transferred to another person or dispatched properly under chain-of-custody rules.
- The sample collector will record sample data in the field notebook.
- The project manager will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

5.2.1 Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. A custody seal is placed over the cap of individual sample bottles by the sampling technician. Sample shipping containers (coolers, cardboard boxed, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. Strapping tape should be placed around the lid to ensure that seals are not accidentally broken during shipment and in a manner that allows easy removal by laboratory personnel. On receipt at the laboratory, the custodian must check (and certify, by completing logbook entries) that seals on boxes and bottles are intact.

5.2.2 Chain-of-Custody Record

The chain-of-custody record must be fully completed in duplicate, using black carbon paper or equivalent where possible, by the field technician who has been designated by the project manager as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the custody record.

5.3 Sample Handling, Packaging and Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States Department of Transportation (DOT) in the Code of Federal Regulations, 49 CFR 171 through 177.

5.3.1 Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with the original containers.
- The sample bottle should never be completely filled except for VOA bottles. At a minimum, a 10% void space should be left in the bottle to allow for expansion. The sample volume level should be marked with a grease pencil or by placing the top of the label at the appropriate sample height.
- All sample bottles must be sealed around the neck or the jar lid with clear tape. Any custody seals should be affixed prior to sealing the bottle.
- All sample bottles shall be placed in plastic Ziploc® bags to minimize contact with inert packing material, unless foam inserts are used.
- Foam inserts should be used as inert packing material when shipping low hazard water samples via a common carrier to the laboratory.
- Low-hazard environmental samples are to be cooled. "Blue ice" or some other artificial icing material, or ice placed in plastic bags, may be used. Ice will not be used as a substitute for packing material.
- A duplicate custody record must be placed in a plastic bag and taped to the inside of the cooler lid. Custody seals are affixed to the sample cooler.
- The cooler will be labeled as containing a hazardous material if it contains medium or high-hazard samples. Labeling requirements differ depending on the type of material being shipped; the majority of soil samples may be shipped as a class "9" hazardous material with the proper shipping name "OTHER REGULATED SUBSTANCES (ENVIRONMENTAL SAMPLES)."

- A hazardous material shipping manifest will be completed for each cooler of medium to high-hazard samples and affixed to the lid of the cooler.
- Low-hazard environmental samples do not require a hazardous material shipping manifest. The words "LABORATORY SAMPLES" should be printed on the top of the cooler for low-hazard samples.
- Samples packaged and shipped as limited-quantity radioactive material must comply with DOT and shipper regulations for package contamination limits, surface exposure rate, and air bill completion.

5.3.2 Shipping Containers

Environmental samples will be properly packaged and labeled for transport and dispatched for analysis to the appropriate subcontracted laboratory for geotechnical analyses. A separate chain-of-custody record must be prepared for each container. The following requirements for marking and labeling of shipping containers will be observed:

- Use abbreviations only where specified;
- The words "This End Up" or "This Side Up" must be clearly printed on the top of the outer package. Upward-pointing arrows should be placed on the sides of the package. The words "Laboratory Samples" should also be printed on the top of the package; and
- After a container has been closed, two custody seals are placed on the container—one on the front and one on the back. The seals are protected from accidental damage by placing strapping tape over them.

Field personnel will make timely arrangements for transportation of samples to the laboratory. When custody is relinquished to a shipper, field personnel will telephone the laboratory custodian to inform him of the expected time of arrival of the sample shipment and to advise him of any time constraints on sample analysis.

5.3.3 Shipping Procedures

- The coolers in which the samples are packed must be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving them must sign, date, and note the time on the record. This record documents sample custody transfer.
- Samples must be dispatched to the laboratory for analysis with a separate chain-of-custody record accompanying each shipment. Shipping containers must be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information are entered in the "Remarks" section of the chain-of-custody record.
- All shipments must be accompanied by the chain-of-custody record identifying their contents. The original record accompanies the shipment, and the yellow copy is retained by the site team leader.
- If sent by mail, the package is registered with return receipt requested. If sent by common carrier, a bill of lading is used. Freight bills, Postal Service receipts, and bills of lading are retained as part of the permanent documentation.

- Samples must be shipped to the analytical laboratory within 24 to 48 hours from the time of collection.

5.4 Laboratory Custody Procedures

The designated sample custodian at the laboratory will be responsible for maintaining the chain-of-custody for samples received at the lab. The custodian must adhere to the following basic requirements:

- When the sample arrives at the lab, the custodian will complete a Cooler Receipt & Preservation Form for each cooler/package container.
- Upon receipt, the coolers are examined for the presence and condition of custody seals, locks, shipping papers, etc. Shipping labels are removed and placed on scrap paper and added to the receiving paper work. The custodian then completes the chain-of-custody record by signing and recording the date and time the package is opened.
- Acceptance criteria for cooler temperature is 0-6°C. If a cooler exhibits a temperature outside this range, the anomalies are noted on the Cooler Receipt & Preservation Form.
- The custodian will then unload the samples from the cooler(s)/container(s), assign an identification number to each sample container, and affix a barcode label to each sample container for logging in and out of the LIMS system.

Adherence to this procedure will ensure that all samples can be referenced in the computer tracking system. All sample control and chain-of-custody procedures applicable to the analytical laboratory are presented in laboratory SOPs available for review.

6.0 Analytical Methods

All laboratory analyses will be performed by ALS Environmental, Inc., an accredited and appropriately (NYSDEC ELAP CLP) certified analytical laboratory.

6.1 Analytical Capabilities

The analytical laboratory is fully equipped for analysis of all types of water, air, and soil samples for chemical contaminants, bacteriological quality, and general characterization. Proven and approved analytical techniques are used, backed up by a rigorous system of QC and QA checks to ensure reliable and defensible data. All laboratory work is performed in accordance with guidelines established by EPA, the New York State Department of Health (NYSDOH), and the National Institute of Occupational Safety and Health (NIOSH).

Organic analysis is accomplished by gas chromatography (GC), high performance liquid chromatography (HPLC), and or GC/mass spectrometry (MS). Liquid, soil, and air samples are analyzed routinely for pesticides, polychlorinated biphenyls (PCBs), volatile organics, extractable organics, and other groups of compounds, as necessary. The laboratory uses two (2) types of instruments for analysis of metals in various matrices: AAS and ICP.

Laboratory procedures to be utilized for sample preparation and analysis are referenced in the NYSDEC Analytical Services Protocol.

6.2 Method Detection Limits

Method detection limits are determined according to procedures outlined in 40 CFR Part 136, Appendix B or EPA Contract Laboratory Protocol. General analytical detection limits are usually determined by the lowest point on the curve. Detection limits are determined at least annually for all appropriate analytical methods. A listing of the laboratory's method detection limits is available upon request.

6.3 Quality Control Samples

Laboratory QC consists of analysis of laboratory blanks, duplicates, spikes, standards, and QC check samples as appropriate to the methodology. These laboratory QC samples are described below.

6.3.1 Laboratory Blanks

Three (3) types of laboratory blanks, one or more of which will be utilized depending on the analysis are described below:

- Method blanks consist of analyte-free water and are subjected to every step of the analytical procedure to determine possible contamination.
- Reagent blanks are similar to method blanks but incorporate only one of the preparation reagents in the analysis. When a method blank indicates significant contamination, one or more reagent blanks are analyzed to determine the source.
- Calibration blanks consist of pure reagent matrix and are used to zero an instrument's response, thus establishing the baseline.

6.3.2 Calibration Standards

A calibration standard may be prepared in the laboratory by dissolving a known amount of a pure compound in an appropriate matrix. The final concentration calculated from the known quantities is the true value of the standard. The results obtained from these standards are used to generate a standard curve and thereby quantitate the compound in the environmental sample. A minimum of three (3) calibration standards will be used to generate a standard curve for all analyses.

6.3.3 Reference Standard

A reference standard is prepared in the same manner as a calibration standard but from a different source. Reference standards may be obtained from the EPA. The final concentration calculated from the known quantities is the "true" value of the standard. The important difference in a reference standard is that it is not carried through the same process used for the environmental samples, but is analyzed without digestion or extraction. A reference standard result is used to validate an existing concentration calibration standard file or calibration curve.

6.3.4 Spike Sample

A sample spike is prepared by adding to an environmental sample (before extraction or digestion) a known amount of pure compound of the same type that is to be assayed for in the environmental sample. Spikes are added at one (1) to ten (10) times the expected sample concentration or approximately 10 times the method detection limit. These spikes simulate the background and interferences found in the actual samples, and the calculated percent recovery of the spike is taken as a measure of the accuracy of the total analytical method.

A blank spike is the same as a spike sample except the spike is added to analyte-free water. The blank spike is used to determine whether the sample preparation and analysis are under control.

6.3.5 Surrogate Standard

A surrogate is prepared by adding a known amount of pure compound to the environmental sample; the compound selected is not one expected to be found in the sample, but is similar in nature to the compound of interest. Surrogate compounds are added to the sample prior to extraction or digestion. Surrogate spike concentrations indicate the percent recovery of the analytes and, therefore, the efficiency of the methodology.

6.3.6 Internal Standard

Internal standards are similar to surrogate standards in chemical composition but are used to quantify the concentration of analytes sampled based on the relative response factor. Internal standards are added to the environmental sample just prior to instrumental analysis.

6.3.7 Laboratory Duplicate or Matrix Spike Duplicate

Laboratory duplicates are aliquots of the same sample that are split prior to analysis and treated exactly the same throughout the analytical method. Spikes and duplicates for the batch are normally aliquots of the same sample. For organics, spikes are added at approximately ten (10) times the method detection limit. The RPD between the values of the matrix spike and matrix spike duplicate for organics or between the original and the duplicate for inorganics is taken as a measure of the precision of the analytical method.

In general, the tolerance limit for RPDs between laboratory duplicates should not exceed 20% for validation in homogeneous samples.

6.3.8 Check Standard/Samples

Inorganic and organic check standards or samples are prepared with reference standards or are available from the EPA. They are used as a means of evaluating analytical techniques of the analyst. Check standards or samples are subjected to the entire sample procedure, including extraction, digestion, etc., as appropriate for the analytical method utilized. The check standard or sample can provide information on the accuracy of the analytical method independent of various sample matrices.

6.4 Laboratory Instrumentation

Laboratory capabilities will be demonstrated initially for instrument and reagent/ standards performance as well as accuracy and precision of analytical methodology. A discussion of reagent/standard procedures and brief descriptions of calibration procedures for major instrument types follow.

All standards are obtained directly from EPA or through a reliable commercial supplier with a proven record for quality standards. All commercially supplied standards will be traceable to EPA or NIST reference standards and appropriate documentation will be obtained from the supplier. In cases where documentation is not available, the laboratory will analyze the standard and compare the results to a known EPA-supplied or previous NIST-traceable standard.

All sections of the laboratory will have SOP for standard and reagent procedures to document specific standard receipt, documentation, and preparation activities. In general, the individual SOPs incorporate the following items:

- Documentation and labeling of date received, lot number, date opened, and expiration date;
- Documentation of traceability;
- Preparation, storage, and labeling of stock and working solutions; and
- Establishing and documenting expiration dates and disposal of unusable standards.

Each laboratory instrument will be labeled clearly with a unique identifier that relates to all laboratory calibration documentation. Laboratory SOPs and calibration procedures are detailed in the laboratory's Quality Assurance Manual, available upon request.

7.0 Data Reporting and Validation

7.1 Deliverables

Once the contract laboratory has provided all analytical data and hydrogeologic information has been evaluated, Lu Engineers will develop an IRM construction completion report (CCR).

The report will carefully document the cover system installation and will be supplemented with photographic documentation and analytical reports.

7.1.1 Category B Data Package

All analytical data will be reported by the laboratory with NYSDEC ASP Category B deliverables. The Category B data package includes:

1. A detailed summary of the report contents and any quality control outliers or corrective actions taken.
2. Chain of Custody documentation
3. Sample Information including: date collected, date extracted, date analyzed, and analytical methods.
4. Data (including raw data) for:
   - samples
   - laboratory duplicates
   - method blanks
   - spikes and spike duplicates
   - surrogate recoveries
   - internal standard recoveries
   - calibrations
   - any other applicable QC data
5. Method detection limits and/or instrument detection limits
6. Run logs, standard preparation logs, and sample preparation logs
7. Percent solids (where applicable).

7.1.2 Quality Assurance Reports

For the laboratory, a general QA report summarizing problems encountered throughout the laboratory effort, including sample custody, analyses, and reporting, is provided to Lu Engineers' project QA management by the QA coordinator. This report identifies areas of concern and possible resolutions in an effort to ensure data quality.

Upon completion of a project sampling effort, analytical and QC data will be included in a comprehensive report that summarizes the work and provides a data evaluation. A discussion of the validity of the results in the context of QA/QC procedures will be made, as well as a summation of all QA/QC activity.

Serious analytical or sampling problems will be reported to NYSDEC. Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. Corrective actions may include altering procedures in the field, conducting an audit, or modifying laboratory protocol. All corrective actions will be implemented after notification and approval of NYSDEC.

In addition to the laboratory report narrative, QA data validation reports that include any contractual requirements will also be provided to NYSDEC. These QA reports will be submitted with the analytical data, on a monthly basis, or at the conclusion of the project.

7.2 Data Validation and Usability

Prior to the submission of the report to NYSDEC, all data will be evaluated for precision, accuracy, and completeness.

QA/QC requirements from both methodology and company protocols will be strictly adhered to during sampling and analytical work. All data generated will be reviewed by comparing and interpreting results from instrumental responses, retention time, determination of percent recovery of spiked samples or blanks, and reproducibility of duplicate sample results. All calculations and data manipulations are included in the appropriate methodology references. Control charts and calibration curves will be used to review the data and identify outlying results.

7.2.1 Data Validation

It is understood that a data usability summary report (DUSR) will be prepared for this project. If necessary, a third-party validator will be responsible for an independent review of all analytical work performed under the NYSDEC ASP-CLP protocol. The functions will be to assess and summarize the quality and reliability of the data for the purpose of determining its usability and to document for the historical record of each site any factors affecting data usability, such as discrepancies, poor laboratory practices, and site locations that are difficult to analyze. The data validator will be responsible for determining completeness and compliance. Lu Engineers' QA officer will be responsible for determining data usability and overseeing the work of the data validator.

Information available to the data validator and the QA officer for performance of these functions include the NYSDEC ASP Category B data package, information from the sampling team regarding

field conditions and field QA samples, chain-of-custody and shipping forms. The data package is designed to provide all necessary documentation to verify compliance with NYSDEC ASP CLP protocol and the accuracy and reliability of the reported results.

The laboratory will deliver the data package to the project QA coordinator for processing prior to submission to the data validator. The project QA coordinator will review the report for immediate problems, summarize the data for in-house use, and process the work order for the third-party data-validation subcontract within five working days.

In order to effectively review the data package, the data validator will obtain a general overview of each case. This includes the exact number of samples, their assigned numbers, and their matrix. The data validator will deliver the data validation report within 30 days of receipt of the data package.

If a problem arises between the data validator and the laboratory, the data validator must submit written questions to the laboratory. The laboratory will be required to respond in writing within 10 working days to correct any deficiencies. If the data validator does not receive a written response from the laboratory within the specified time period, the data in question shall be considered noncompliant.

Sampling locations will be obtained from the sampling records, such as the chain-of-custody forms. This information is necessary for preparation of the data summary, evaluation of adherence to sample holding times, discussion of matrix problems, and discussion of contaminants detected in the samples.

The following is a brief outline of the data validation process:

- Compilation of all samples with the dates of sampling, laboratory receipt, and analysis;
- Compilation of all QC samples, such as field blanks, field duplicates, MS/MSD samples, laboratory blanks, and laboratory replicates;
- Review of chain-of-custody documents for completeness and correctness;
- Review of laboratory analytical procedure and instrument performance criteria;
- Qualification of data outside acceptable QC criteria ranges;
- Preparation of a memorandum summarizing any problems encountered and the potential effects on data usability;
- Preparation of a data summary, including validated results, with sample matrix, location, and identification; and
- Tabulation of field duplicates, laboratory replicate, and blank results.

Copies of all data validation and usability reports, as well as all data summary packages, will be provided to the NYSDEC project manager. In addition, copies of all analytical raw data will be provided to NYSDEC upon request.

7.2.2 Data Usability

A DUSR will be provided after review and evaluation of the analytical data package. The DUSR will contain required elements listed in Appendix 2B of *DER-10 Technical Guidance for Site Investigation and Remediation*.

The DUSR will include a description of the samples and analytical procedures used. Any data deficiencies, protocol deviations, or quality control problems will be discussed as to their effect on data results. The report will also include any suggestions for resampling or reanalysis.