DRAFT
INTERIM REMEDIAL MEASURES WORK PLAN

SOIL EXCAVATION:
HERITAGE DRIVE - PROPOSED TOWN RIGHT OF WAY (ROW)

HUDSON RIVER PSYCHIATRIC CENTER – NORTH AREA
TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK
NYSDEC #C314121

PREPARED FOR:

EFG/DRA Heritage, LLC
4601 DTC Boulevard, Suite 120
Denver, CO 80237

PREPARED BY:

48 Springside Avenue
Poughkeepsie, New York 12603
Phone: 845-454-2544 • Fax: 845-454-2655

January 2020
File #560909

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CERTIFICATION

I, James Venture, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Interim Remedial Measures 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).

James Venture
Name

090502
NYS PE License Number

DRAFT

Signature

Date

1.0 INTRODUCTION

1.1 Purpose and Objective

This Interim Remedial Measures (IRM) Work Plan was prepared by Partridge Venture Engineering, PC, dba PVE Engineering, (PVE) on behalf of EFG/DRA Heritage, LLC (EFG/DRA n/k/a EFG/Saber Heritage SC, LLC). EFG/DRA has entered into the Brownfield Cleanup Program (BCP No. C314121) with the New York State Department of Environmental Conservation (NYSDEC) as a "Volunteer", to investigate and, where necessary, remediate a 40-acre portion of the former Hudson River Psychiatric Center (HRPC).

Objective

The objective of this IRM Work Plan (IRMWP) is to remove soil containing contaminants at concentrations exceeding 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives (RRSCO, the potential soil cleanup objective (SCO) for the Site) within the proposed Right-of-Way (ROW Heritage Drive) within the boundary of the BCP Site. This ROW will be the location of a future Town-owned road that will be deeded to the Town of Poughkeepsie (Hudson View Dive, Paint Shop Road, Winslow Gate Road). See Figures 1 and 2 (Site Location Map and Selected Site Features, respectively.)

This IRM Work Plan was prepared in accordance with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (May 2010). In accordance with Sections 1.6, 1.11, 5.3 and 5.4 of the DER-10 document, this IRM Work Plan includes the following items:

- A summary of findings from the Remedial Investigation;
- A description of the proposed IRM, including supplemental Site Characterization with associated sampling; excavation, and end-point sampling;
- Health and Safety Plan (HASP), Quality Assurance Project Plan (QAPP), and;
- Community Air Monitoring Plans (CAMP) that describe monitoring procedures and vapor, odor and dust control to be implemented during IRM activities;
- A schedule for implementation and reporting.

1.2 Project Background

The former HRPC property is located on the east side of US Route 9 in the Town of Poughkeepsie, New York, and borders the southern boundary of the Town of Hyde Park. The Brownfield Cleanup Program (BCP) Area (the Site) is an approximately 40-acre area in the northeastern part of the larger property, identified on Town of Poughkeepsie Tax Maps as Section 6163 Block 03 Lot 011149. The boundaries of the Site are shown in Figures 1 and 2.

The topography of the Site varies considerably. In the northeastern quadrant of the Site, elevations range from approximately 150 feet to 220 feet above Mean Sea Level (MSL). Regional surface water flows in a westerly direction toward the Hudson River, the eastern bank of which is approximately 0.50 miles west of the western boundary of the BCP Site. Regional groundwater flow is to the southwest. Localized groundwater movement in the vicinity of the BCP Site is likely influenced by topography and underlying bedrock surface contours. Depth to groundwater ranges from 7-15 feet below grade.

Construction of the HRPC began in 1868, the facility expanded and eventually housed more than 6,000 residents. The property included patient dormitories, residences, office and administration buildings, support services buildings, recreation facilities, a Powerhouse, parking areas, and undeveloped land.

Based on the results of previous investigations by consultants, and other research into the history of the property, PVE identified the following Areas of Concern (AOCs) which were investigated during the Remedial Investigation (RI) between 2014 and 2015:

- AOC-1: Powerhouse and Former Coal Storage Area
- AOC-2: Auto Garage Area
- AOC-3: Car Wash Area
- AOC-4: Former Fire Station Fuel Storage and Dispensing Area
- AOC-5: Building 49 Former Gasoline Fueling Station
- AOC-6: Mortuary
- AOC-7: Maintenance Building

The focus area of this IRM is the ROW which transects the BCP Site (Figure 3). The easternmost extent of the ROW is outside the BCP boundary, at the intersection with US Route 9. The ROW extends to the west in the direction of the BCP Site, ultimately crossing it and connects with the current Paint Shop Road to the west of the BCP site. The portion of the ROW within the BCP is approximately 1,500 feet long and 60 feet wide, or approximately 90,000 square feet.

1.3 Remedial Investigations Summary and Findings

1.3.1 Remedial Investigation - Field Tasks

Field work for the Remedial Investigation (RI) was performed at the Site between April and December 2014, in accordance with the NYSDEC approved Remedial Investigation Work Plan (RIWP), dated April 2014, and subsequently approved Addenda (1, 2, and 3).

Below is a summary of the RI investigation and results from sampling within the ROW boundaries within the BCP Site. The following were conducted:

1. Field work was completed in accordance with the procedures specified in PVE 's Health and Safety Plan (HASP) and Quality Assurance Project Plan (QAPP),
2. A private utility mark-out and geophysical survey were completed to locate subsurface utilities. Boring locations were adjusting accordingly within the field as necessary.
3. Two (2) soil borings were completed within the ROW (MNTC-3 and MNTC-4). These borings were advanced to depths of 10.5 feet bgs and 23.0 feet bgs, respectively. Subsurface soil within these borings consisted of primarily brown sand, little clay, silt, and gravel.
4. One (1) soil sample (MNTC-3 - 8-10') was collected from 8-10' bgs within boring MNTC-3. Three (3) soil samples (MNTC-4 – 0-2'; MNTC-4 – 2-24"; and MNTC-4 – 10-12') were collected at depths of 0-2" bgs, 2-24" bgs, and 10-12' bgs within boring MNTC-4.
5. Two (2) surface soil samples (SS-13, SS-14) were collected from within the ROW at depths of 0-2" bgs.
6. Two (2) soil vapor probes were installed within the ROW, and two (2) soil vapor samples were collected and analyzed for VOCs via TO-15.

1.3.2 Remedial Investigation - Findings

Results of RI sampling activities within the ROW are summarized below; analytical results are presented in Tables 1A-1D, attached.

1. Subsurface soil is predominately fill material consisting of brick and rock fragments with interspersed silt and sand. Glacial till, consisting of silt, sand and gravel underlies the fill material. Depth to bedrock has not been established. Depth to groundwater across the Site ranges from approximately 11 to 28 feet below grade.

2. Contaminants were detected at concentrations exceeding RRSCOs in one of the soil borings (MNTC-4 located within AOC-7 (Maintenance Building)) at a depth of 0 to 2 inches below grade. Sample MNTC-4, contained Arsenic at 33.5 mg/kg, which exceeds the RRSCO of 16 mg/kg. Analytical results for soil samples are presented in Tables 1A–1D.

1.4 Summary of the Proposed Interim Remedial Measure

Steps to complete the proposed IRM include:

1. Site mobilization involving equipment mobilization, utility mark outs and marking & staking boring locations completed during the RI, and proposed Site Characterization Borings;
2. Site Characterization in the ROW will include drilling twenty (20) borings to a depth of 15 feet bgs. Up to three (3) soil samples will be collected from each of the 20 borings.
3. Excavation, segregation and stockpiling of soil from 0 – 2' within the ROW, and stockpiled in the proposed Soil Management Area (Figure 5);
4. Excavation, segregation, and stockpiling of soil within the ROW that contains contaminants at concentrations exceeding RRSCOs.
5. Collection and analysis of end-point soil samples in accordance with DER-10;
6. Implementation of a Community Air Monitoring Program (CAMP) and work zone air monitoring for VOCs and particulates during all field activities (Appendix C); and
7. Submittal of an IRM Activities Report that describes the IRM and certifies that the remedial requirements have been achieved.

A detailed description of IRM tasks is provided in Section 2.0.

1.5 Project Management and Organization

1.5.1 Personnel

The general responsibilities of key project personnel are listed below.

NYSDEC Project Manager – Gerald Pratt will have responsibility for regulatory oversight of the work associated with BCP Site No. C314121.

Project Manager – Conor Tarbell will be responsible for managing the implementation of the activities associated with the IRM.

Field QA Officer – Anthony Spadavecchia will be responsible for the overall operation of the field team and will report directly to the Project Manager.

2.0 IRM ACTIVITIES

2.1 Field Activities

Field activities during the proposed IRM include site meetings, mobilization, implementing the health and safety plan, soil borings, soil excavation and relocation, end-point sampling and analytical testing for waste classification, and equipment decontamination. Subcontractors will be used for drilling soil borings, excavation, stockpiling, transportation/disposal, and analytical testing of end-point samples.

2.1.1 Site Meeting

A Site "kick-off" meeting will be held with PVE, drilling contractors and earth work contractor(s) prior to initiating field work activities. The purpose of the meeting will be to orient field team members and subcontractors with the Site, project personnel, Site background, scope of work, potential dangers, health and safety requirements, site-specific security and safety protocols, emergency contingencies and other field procedures. NYSDEC staff are welcome to attend and will be notified at least seven (7) days in advance of the meeting.

2.1.2 Mobilization

Following approval of the IRM Work Plan by NYSDEC, PVE and its subcontractors will mobilize necessary materials and equipment to the Site.

2.1.3 Health and Safety

It is anticipated that the work to be completed at the Site will be performed at level D personal protective equipment (PPE). Should health and safety monitoring during field activities warrant an upgrade to level C protection, work will temporarily stop, and level C PPE will be donned. The work area/breathing zone air monitoring program will be implemented by employing direct-reading survey instruments to identify the appropriate level of PPE needed based on total organic vapor and particulate concentrations. See the site specific HASP in Section 6 and Appendix B for additional information on Health and Safety.

2.1.4 Soil Characterization

Soil borings will be completed across the ROW for collection and analysis of soil samples; all sampling procedures will be completed in accordance with the RI Work Plan supporting documents (2014), and revised QAPP and HASP, attached. A direct push/hollow stem auger drilling method will be implemented using a truck-mounted GeoProbe™ rig for soil borings. A

total of twenty (20) soil borings will be advanced to a depth of 15 feet bgs. Borings will be spaced approximately 75 feet apart (Figure 4). Soils from the borings will be visually inspected for contamination, and field-screened for VOCs using a photo-ionization detector (PID), and headspace techniques.

Samples will be collected from up to three (3) discrete horizons from each of the 20 borings: One (1) shallow sample (2-4 feet below grade); and up to two (2) subsurface soil samples, one of which will be collected at groundwater, refusal, or 15 feet below grade, whichever is encountered first.

Samples will be submitted to a NYSDOH ELAP-laboratory for analysis of 6 NYCRR Part 375 parameters, as described below:

- Target Compound List (TCL) VOCs by EPA Method 5035/8260;
- TCL SVOCs by EPA Method 8270;
- PCBs by EPA Method 8082;
- Pesticides by EPA Method 8081;
- TAL metals by EPA Method 6000/7000 series.

Approximately 20% of the soil samples will be submitted to a NYSDOH ELAP-laboratory for analysis of "Emerging Contaminants" as defined by NYSDEC:

- PFAS via USEPA Modified Method 537 (analytes summarized below
- 1,4-Dioxane via USEPA Method 8270

Please refer to the Sample Analysis Table (Table 2) for further sampling description. ASP Category B deliverables will be prepared by the Laboratory in the event data validation and a Data Usability Summary Report (DUSR) are required. ***PFAS Analysis and Reporting:*** DER has established a PFAS target analyte list to provide consistency in reporting. Analytes and sampling protocol will conform to the procedures provided in PVE's approved Sampling and Analysis Plan for Emerging Contaminants, dated October 2018.

PVE will prepare site figures which depict the area of soils with concentrations of contaminants that exceed RRSCOs within the ROW.

2.2 Community Air Monitoring Plan (CAMP)

CAMP will be implemented during the IRM to protect the health and safety of site workers and the surrounding community. This effort will include monitoring within and around the perimeter of the work area, in accordance with DER-10 Appendix 1A (attached as Appendix C). Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report. A request to terminate CAMP will be submitted to NYSDEC for consideration after 5 consecutive days of field work, if appropriate.

2.3 Soil Excavation – 0-2 Feet Below Grade

Based on results assembled during the RI, the top 0-2 feet of soil within the ROW is assumed to contain contaminants at concentrations exceeding RRSCOs, therefore no additional characterization of this material will be performed. Soil from 0-2 feet below grade will be excavated and placed in the Soil Management Area (Figure 5).

2.4 Soil Excavation – Material Exceeding RRSCOs

Soil will be excavated from the areas where demonstrated to contain contaminants at concentrations exceeding RRSCOs, based on the findings from Section 2.1.4. Soil will be excavated using standard earth-moving equipment, as needed, and placed in the Soil Management Area. Contaminated soil will be excavated to a maximum depth of 15 feet below grade. Appropriate benching, shoring and/or sloping of excavation sidewalls will be completed in accordance with OSHA requirements.

Upon completion of end-point sampling activities (Section 2.5.1, below), the excavated area will be backfilled and compacted in accordance with the Town/County-approved plan for backfilling.

2.5 Environmental Analytical Testing Program

Prior to backfilling, confirmatory soil samples will be collected from the excavation ("end-point samples") to confirm the efficacy of the remedial measures, and waste characterization samples will be collected, if required for disposal off-site. All samples will be collected in accordance with this work plan. The QAPP (see Section 5 and Appendix A) has been prepared to establish methods and procedures for conducting the end-point and waste characterization sampling. The QAPP includes general field guidelines, sample equipment decontamination, soil sampling procedures, and field instrument descriptions and calibration procedures. All sampling will be conducted in accordance with the QAPP. The following subsections detail the end-point and waste characterization sampling plans for soil.

2.5.1 End-point Sampling

Post-excavation end-point soil samples will be collected in accordance with the frequency and procedures established in DER-10. Samples will be retained in laboratory-provided glassware and delivered to a NYSDOH ELAP-certified laboratory for analysis of 6 NYCRR Part 375 parameters, as described below:

- Target Compound List (TCL) VOCs by EPA Method 5035/8260;
- TCL SVOCs by EPA Method 8270;
- PCBs by EPA Method 8082;
- Pesticides by EPA Method 8081;
- TAL metals by EPA Method 6000/7000 series.

ASP Category B deliverables will be prepared by the Laboratory in the event data validation and a Data Usability Summary Report (DUSR) are required.

2.5.2 Waste Characterization

If necessary, to meet remedial objectives characterization samples will be collected from soil that is required to be disposed of off-site. Contaminated soil will be stockpiled separately from soil that is presumed to meet SCOs. Samples will be collected from stockpiled materials and analyzed in accordance with the disposal facility's permit requirements and disposed of off -site in accordance with all applicable rules and regulations.

2.6 Data Review

All samples undergoing laboratory analysis will be subject to a third-party data review process in accordance with the QAPP, to ensure the usability of the data collected. Data usability summary reports documenting any issues with QA/QC will be prepared and included in the RI Report.

3.0 DATA DOCUMENTATION

Comprehensive field notes will be maintained during IRM field work. In addition, daily reports that summarize the field work will be prepared and will become part of the project file. Daily reports will include a summary of work activities and a brief photographic log. All daily reports and photographic logs will be included in the IRM Activities Report.

3.1 Daily Reports

Daily reports will be provided by electronic media to NYSDEC's Project Manager while invasive work, or contaminated materials handling and disposal is occurring. If unforeseen conditions are encountered during field activities, NYSDEC's Project Manager will be contacted via telephone or e-mail within 2 hours.

The daily reports will include the following:

- A summary of the day's activities completed as part of the IRM work and those anticipated for the next reporting period;
- Description of any approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and
- Update of schedule, including unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate any such delays.

3.2 Photographic Log

Photographs of remedial activities will be submitted with the daily reports to NYSDEC. Photos will illustrate remedial program elements and will be of acceptable quality. Representative photos of current site conditions are attached to this work plan (Appendix D). Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. A fully comprehensive photographic log will be submitted with the final IRM Activities Report.

3.3 Deviations from the IRM Work Plan

In cases where the site activities deviate from the IRMWP due to unforeseen Site conditions, a detailed description of the conditions and required deviations from the IRMWP will be

submitted to the NYSDEC Project Manager. The description will include the reasons that dictate deviation from the IRMWP, any changes/editions to the IRMWP, and how the proposed remedy is affected.

4.0 IRM ACTIVITIES REPORT

An IRM Activities Report will be prepared summarizing the work conducted for the characterization and excavation of soil from the ROW. The report will include the following:

- A summary of all activities completed as part of the IRM work;
- Presentation of analytical data from end-point samples in tabulated format;
- Figures depicting the IRM area, with end-point sample locations identified;
- A comprehensive photographic log of the activities completed;
- Receipts documenting off-site disposal of contaminated media; and
- Findings and conclusions from the IRM work.

The report will be submitted to NYSDEC for review.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

The Quality Assurance Project Plan (QAPP) to be used for the IRM activities outlined in this draft work plan is included in Appendix A. The QAPP presents site specific sampling procedures, analytical methods and QA/QC procedures associated with the activities for this BCP Site. Protocols for sample collection, sample handling and storage, Chain of Custody procedures, and laboratory and field analyses are described or specifically referenced to related investigation documents.

6.0 HEALTH AND SAFETY PROTOCOLS

The health and safety protocols to be used for the IRM activities outlined in this draft work plan are presented in the Health and Safety Plan (HASP) included in Appendix B.

7.0 CITIZEN PARTICIPATION

The Citizen Participation Plan (CPP) for the Former Hudson River Psychiatric Center – North Area, dated April 2014, is appended to this draft IRM Work Plan in Appendix E. The CPP outlines how members of the affected and interested public are provided with information about how NYSDEC will inform and involve them during the investigation and remediation of the Site. Information such as project contacts, document repositories, site contact lists, and community participation activities are provided in the CPP.

8.0 SCHEDULE

The following schedule is proposed for the IRM field activities and IRM Activities Report preparation.

Activity:	Duration:	Anticipated Completion Date:
Submit Draft IRM Work Plan:		January 17, 2020
NYDEC Review of IRM Work Plan:	15 days	February 1, 2020
Address NYSDEC Comments, if any and resubmit:	15 days	February 15, 2020
NYDEC Accepts IRM Work Plan:	10 days	Feb 25, 2020
Commence IRM Activities:	45 days	March 15 – April 30, 2020
Preparation and Submittal of IRM Activities Report	30 days	May 31, 2020

TABLE 1A – VOCs IN SOIL

TABLE 1A: Volatile Organic Compounds (VOCs) in Soil

AOC-7 - Maintenance Building Area

Soil Sample Results (non-QA/QC)

Hudson River Psychiatric Center - ROW North BCP Site, Poughkeepsie, NY

PVE File #560909

	Date Sampled	12/17/2014		12/16/2014		5/2/2014		5/2/2014		5/2/2014		5/2/2014	
	Location	MNTC-3		MNTC-4		SS-13		SS-13		SS-14		SS-14	
	Sample ID	MNTC-3 8-10'		MNTC-4 0-2"		SS-13 0-2"		SS-13 12-20"		SS-14 0-2"		SS-14 12-20"	
Analyte	RRSCOs	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
VOCs (µg/kg)													
1,1,1-Trichloroethane	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,1,2,2-Tetrachloroethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,1,2-Trichloroethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,1-Dichloroethane	26000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,1-Dichloroethene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,2,3-Trichlorobenzene	NS	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
1,2,4-Trichlorobenzene	NS	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
1,2,4-Trimethylbenzene	52000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,2-Dibromo-3-Chloropropane	NS	ND< 10.2	U	ND< 14.5	U	ND< 11.1	U	ND< 11.6	U	ND< 13.5	U	ND< 9.26	U
1,2-Dibromoethane (Ethylene Dibromide)	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,2-Dichlorobenzene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,2-Dichloroethane	3100	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,2-Dichloropropane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,3,5-Trimethylbenzene (Mesitylene)	52000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,3-Dichlorobenzene	49000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,4-Dichlorobenzene	13000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
1,4-Dioxane (P-Dioxane)	13000	ND< 20.4	U	ND< 28.9	U	ND< 22.3	U	ND< 23.2	U	ND< 27.0	U	ND< 18.5	U
2-Hexanone	NS	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
Acetone	100000	ND< 10.2	U	ND< 14.5	U	ND< 11.1	U	ND< 11.6	U	ND< 13.5	U	ND< 9.26	U
Benzene	4800	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Bromochloromethane	NS	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
Bromodichloromethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Bromoform	NS	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
Bromomethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Carbon Disulfide	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Carbon Tetrachloride	2400	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Chlorobenzene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Chloroethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Chloroform	49000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Chloromethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Cis-1,2-Dichloroethylene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Cis-1,3-Dichloropropene	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Cyclohexane	NS	ND< 10.2	U	ND< 14.5	U	ND< 11.1	U	ND< 11.6	U	ND< 13.5	U	ND< 9.26	U
Cymene	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Dibromochloromethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Dichlorodifluoromethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Ethylbenzene	41000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Isopropylbenzene (Cumene)	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Methyl Acetate	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	13.3	
Methyl Ethyl Ketone (2-Butanone)	100000	ND< 10.2	U	ND< 14.5	U	ND< 11.1	U	ND< 11.6	U	ND< 13.5	U	ND< 9.26	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
Methyl Tert-Butyl Ether (MTBE)	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Methylcyclohexane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Methylene Chloride	100000	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
M-P-Xylene	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Naphthalene	100000	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
N-Butylbenzene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
N-Propylbenzene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
O-Xylene (1,2-Dimethylbenzene)	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Sec-Butylbenzene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Styrene	NS	ND< 5.11	U	ND< 7.23	U	ND< 5.56	U	ND< 5.81	U	ND< 6.76	U	ND< 4.63	U
T-Butylbenzene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Tetrachloroethylene (PCE)	19000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Toluene	100000	1.61	J	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Trans-1,2-Dichloroethene	100000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Trans-1,3-Dichloropropene	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Trichloroethylene (TCE)	21000	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Trichlorofluoromethane	NS	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U
Vinyl Chloride	900	ND< 2.04	U	ND< 2.89	U	ND< 2.23	U	ND< 2.32	U	ND< 2.70	U	ND< 1.85	U

NOTES:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the official compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs).
2. RRSCO exceedances are in bold and highlighted yellow.
3. ND = Not Detected
4. Results shown as "ND" with Reporting Limits exceeding RRSCOs are in bold.
5. VOCs = Volatile Organic Compounds
6. µg/kg = micrograms per kilogram.
7. Qualifier (Q) definitions are provided in the official lab reports.
8. NS = Not Sampled or No Standard

TABLE 1B – SVOCs IN SOIL

Table 1B: Semi-Volatile Organic Compounds (SVOCs) in Soil

AOC-7 - Maintenance Building Area

Soil Sample Results (non-QA/QC)

Hudson River Psychiatric Center - ROW North BCP Site, Poughkeepsie, NY

PVE File #560909

	Date Sampled	12/17/2014		12/16/2014		5/2/2014		5/2/2014		5/2/2014		5/2/2014	
	Location	MNTC-3		MNTC-4		SS-13		SS-13		SS-14		SS-14	
	Sample ID	MNTC-3 8-10'		MNTC-4 0-2"		SS-13 0-2"		SS-13 12-20"		SS-14 0-2"		SS-14 12-20"	
Analyte	RRSCOs	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
SVOCs (µg/kg)													
1,2,4,5-Tetrachlorobenzene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
1,2,4-Trichlorobenzene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
1,2-Dichlorobenzene	100000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
1,3-Dichlorobenzene	49000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
1,4-Dichlorobenzene	13000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2,2-Oxybis(2-Chloropropane)	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2,3,4,6-Tetrachlorophenol	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2,4,5-Trichlorophenol	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
2,4,6-Trichlorophenol	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2,4-Dichlorophenol	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2,4-Dimethylphenol	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2,4-Dinitrophenol	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
2,4-Dinitrotoluene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2,6-Dinitrotoluene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2-Chloronaphthalene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2-Chlorophenol	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2-Methylnaphthalene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2-Methylphenol (O-Cresol)	100000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
2-Nitroaniline	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
2-Nitrophenol	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
3,3'-Dichlorobenzidine	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
3-Methylphenol	100000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
3-Nitroaniline	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
4,6-Dinitro-2-Methylphenol	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
4-Bromophenyl Phenyl Ether	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
4-Chloro-3-Methylphenol	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
4-Chloroaniline	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
4-Chlorophenyl Phenyl Ether	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
4-Nitroaniline	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
4-Nitrophenol	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
Acenaphthene	100000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Acenaphthylene	100000	ND< 324	U	ND< 325	U	ND< 355	U	180	J	ND< 1820	U	ND< 335	U
Acetophenone	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Anthracene	100000	ND< 324	U	ND< 325	U	ND< 355	U	285	J	ND< 1820	U	ND< 335	U
Atrazine	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Benzaldehyde	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Benzo(A)Anthracene	1000	ND< 324	U	ND< 325	U	ND< 355	U	647		**ND< 1820**	**U**	ND< 335	U
Benzo(A)Pyrene	1000	ND< 324	U	ND< 325	U	ND< 355	U	630		**ND< 1820**	**U**	ND< 335	U
Benzo(B)Fluoranthene	1000	ND< 324	U	ND< 325	U	ND< 355	U	512		**ND< 1820**	**U**	ND< 335	U
Benzo(G,H,I)Perylene	100000	ND< 324	U	ND< 325	U	ND< 355	U	420		ND< 1820	U	ND< 335	U
Benzo(K)Fluoranthene	3900	ND< 324	U	ND< 325	U	ND< 355	U	502		ND< 1820	U	ND< 335	U
Benzyl Butyl Phthalate	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Biphenyl (Diphenyl)	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Bis(2-Chloroethoxy) Methane	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Bis(2-Ethylhexyl) Phthalate	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Caprolactam	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Carbazole	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Chrysene	3900	ND< 324	U	ND< 325	U	ND< 355	U	763		ND< 1820	U	ND< 335	U
Dibenz(A,H)Anthracene	330	ND< 324	U	ND< 325	U	**ND< 355**	**U**	**ND< 337**	**U**	**ND< 1820**	**U**	**ND< 335**	**U**
Dibenzofuran	59000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Diethyl Phthalate	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Dimethyl Phthalate	NS	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
Di-N-Butyl Phthalate	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Di-N-Octylphthalate	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Fluoranthene	100000	ND< 324	U	171	J	ND< 355	U	1290		ND< 1820	U	ND< 335	U
Fluorene	100000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Hexachlorobenzene	1200	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	**ND< 1820**	**U**	ND< 335	U
Hexachlorobutadiene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Hexachlorocyclopentadiene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Hexachloroethane	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Indeno(1,2,3-C,D)Pyrene	500	ND< 324	U	ND< 325	U	ND< 355	U	440		**ND< 1820**	**U**	ND< 335	U
Isophorone	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Naphthalene	100000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Nitrobenzene	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
N-Nitrosodi-N-Propylamine	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
N-Nitrosodiphenylamine	NS	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Pentachlorophenol	6700	ND< 648	U	ND< 650	U	ND< 709	U	ND< 675	U	ND< 3630	U	ND< 670	U
Phenanthrene	100000	ND< 324	U	ND< 325	U	ND< 355	U	838		ND< 1820	U	ND< 335	U
Phenol	100000	ND< 324	U	ND< 325	U	ND< 355	U	ND< 337	U	ND< 1820	U	ND< 335	U
Pyrene	100000	ND< 324	U	194	J	ND< 355	U	1320		ND< 1820	U	ND< 335	U
Total PAH				365				7827					

NOTES:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the official compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs).

2. RRSCO exceedances are in bold and highlighted yellow.

3. ND = Not Detected

4. Results shown as "ND" with Reporting Limits exceeding RRSCOs are in bold.

5. SVOCs = Semi-Volatile Organic Compounds

6. µg/kg = micrograms per kilogram.

7. Qualifier (Q) definitions are provided in the official lab reports.

TABLE 1C – TOTAL METALS IN SOIL

TABLE 1C: Total Metals in Soil

AOC-7 - Maintenance Building Area

Soil Sample Results (non-QA/QC)

Hudson River Psychiatric Center - ROW North BCP Site, Poughkeepsie, NY

PVE File #560909

	Date Sampled	12/17/2014		12/16/2014		5/2/2014		5/2/2014		5/2/2014		5/2/2014	
	Location	MNTC-3		MNTC-4		SS-13		SS-13		SS-14		SS-14	
	Sample ID	MNTC-3 8-10'		MNTC-4 0-2"		SS-13 0-2"		SS-13 12-20"		SS-14 0-2"		SS-14 12-20"	
Analyte	RRSCOs	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Metals (mg/kg)													
Arsenic	16	7.53		**33.5**		5.90		6.56		5.73		4.29	
Aluminum	NS	NS		NS		14300		9480		12400		13400	
Antimony	NS	NS		NS		ND< 8.11	U	ND< 6.80	U	ND< 8.34	U	ND< 6.77	U
Barium	400	51.5		42.7	D	59.1		39.9		60.8		57.9	
Beryllium	72	0.610		0.720		0.567	J	0.514	J	0.567	J	0.617	
Cadmium	4.3	0.557		ND< 0.610	U	ND< 0.676	U	0.497	J	0.380	J	ND< 0.564	U
Calcium	NS	NS		NS		5110		3620		23200		13000	
Chromium, Hexavalent	110	ND< 1.2	U	ND< 1.3	U	ND< 1.2	U	ND< 1.2	U	1.70	M	ND< 1.2	U
Chromium, Total	NS	18.2		14.7		16.0		13.8		19.0		15.5	
Cobalt	NS	NS		NS		9.84		9.50		7.94		8.60	
Copper	270	36.8		24.8		24.7		30.4		23.5		19.2	
Cyanide	27	ND< 0.554	U	ND< 0.451	U	ND< 0.60	U	ND< 0.58	U	ND< 0.66	U	ND< 0.60	U
Iron	NS	NS		NS		24000		18500		19100		20300	
Lead	400	14.5		50.5		33.6		112		66.1		96.6	
Magnesium	NS	NS		NS		6090		4270		16300		4900	
Manganese	2000	826		210	D	813		530		920		882	
Mercury	0.81	0.0475		0.454	M	0.0463		0.0749		0.0532		0.0296	
Nickel	310	28.9		23.8		23.8		24.3		22.5		20.3	
Potassium	NS	NS		NS		943		687		1040		780	
Selenium	180	ND< 1.11	U	ND< 1.22	U	ND< 1.35	U	ND< 1.13	U	ND< 1.39	U	ND< 4.51	U
Silver	180	ND< 1.11	U	ND< 1.22	U	ND< 1.35	U	ND< 1.13	U	ND< 1.39	U	ND< 1.13	U
Sodium	NS	NS		NS		ND< 338	U	ND< 283	U	ND< 347	U	ND< 282	U
Thallium	NS	NS		NS		ND< 3.38	U	ND< 2.83	U	ND< 3.47	U	ND< 2.82	U
Vanadium	NS	NS		NS		21.2		23.1		24.5		16.7	
Zinc	10000	125		43.7	D	84.2		90.8		102		72.1	

NOTES:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the official compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs).
2. RRSCO exceedances are in bold and highlighted yellow.
3. ND = Not Detected
4. Results shown as "ND" with Reporting Limits exceeding RRSCOs are in bold.
5. mg/kg = milligrams per kilogram.
6. Qualifier (Q) definitions are provided in the official lab reports.
7. NS = Not Sampled or No Standard

TABLE 1D – PESTICIDES, HERBICIDES, AND PCBs IN SOIL

TABLE 1D: Pesticides, Herbicides, and PCBs in Soil

AOC-7 - Maintenance Building Area

Soil Sample Results (non-QA/QC)

Hudson River Psychiatric Center - ROW North BCP Site, Poughkeepsie, NY

PVE File #560909

	Date Sampled	12/17/2014		12/16/2014		5/2/2014		5/2/2014		5/2/2014		5/2/2014	
	Location	MNTC-3		MNTC-4		SS-13		SS-13		SS-14		SS-14	
	Sample ID	MNTC-3 8-10'		MNTC-4 0-2"		SS-13 0-2"		SS-13 12-20"		SS-14 0-2"		SS-14 12-20"	
Analyte	RRSCOs	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Pesticides (µg/kg)													
Aldrin	97	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Alpha Bhc (Alpha Hexachlorocyclohexane)	480	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Alpha Chlordane	4200	ND< 3.24	U	2.67	JP	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Alpha Endosulfan	24000	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Beta Bhc (Beta Hexachlorocyclohexane)	360	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Beta Endosulfan	24000	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Chlordane	NS	NS		NS		ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Delta BHC (Delta Hexachlorocyclohexane)	100000	ND< 3.24	U	3.08	J	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Dieldrin	200	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Endosulfan Sulfate	24000	ND< 3.24	U	8.36	PM	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Endrin	11000	ND< 3.24	U	2.59	J	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Endrin Aldehyde	NS	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Endrin Ketone	NS	ND< 3.24	U	1.71	JP	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Gamma Bhc (Lindane)	1300	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Gamma Chlordane	NS	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Heptachlor	2100	ND< 3.24	U	ND< 3.37	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Heptachlor Epoxide	NS	ND< 3.24	U	1.95	JP	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
Methoxychlor	NS	ND< 3.24	U	2.56	JP	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
P,P'-DDD	13000	ND< 3.24	U	2.19	JP	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
P,P'-DDE	8900	ND< 3.24	U	1.89	JP	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U	ND< 0.1	U
P,P'-DDT	7900	ND< 3.24	U	4.75		4.20		6.50		3.40	J	ND< 0.1	U
Toxaphene	NS	ND< 32.4	U	ND< 33.7	U	ND< 210	U	ND< 200	U	ND< 220	U	ND< 200	U
Herbicides (µg/kg)													
Silvex (2,4,5-TP)	100000	ND< 14	U	ND< 15	U	ND< 241	U	ND< 234	U	ND< 263	U	ND< 241	U
PCBs (mg/kg)													
PCB-1016 (Aroclor 1016)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1221 (Aroclor 1221)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1232 (Aroclor 1232)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1242 (Aroclor 1242)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1248 (Aroclor 1248)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1254 (Aroclor 1254)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1260 (Aroclor 1260)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1262 (Aroclor 1262)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U
PCB-1268 (Aroclor 1268)		ND< 0.0324	U	ND< 0.0337	U	ND< 0.0356	U	ND< 0.0335	U	ND< 0.0362	U	ND< 0.0336	U

NOTES:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the official compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs).
2. RRSCO exceedances are in bold and highlighted yellow.
3. ND = Not Detected
4. Results shown as "ND" with Reporting Limits exceeding RRSCOs are in bold.
5. PCBs = Polychlorinated Biphenyls
6. µg/kg = micrograms per kilogram.
7. mg/kg = milligrams per kilogram.
8. Qualifier (Q) definitions are provided in the official lab reports.
9. NS = Not Sampled or No Standard

TABLE 2 – SAMPLE ANALYSIS TABLE

Table 2. Sample Summary Table; IRM Heritage Drive Right of Way
PVE, LLC File #560909
NYSDEC #C314121

	Matrix	Sample Depth	Analytical* (Including QA/QC)							Number of Samples per Location (including QA/QC)	Rationale for Sampling
			TAL Metals	TCL VOCs	TCL SVOCs	Pesticides	PCBs	MS/MSD	EC's		
BROWNFIELD CLEANUP PROGRAM - IRM											
Boring 1 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 2 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1	1		2	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 3 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 4 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 5 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	0	0	0	0	0		1	0	Interval previously characterized by analysis of Sample MNTC-4 (10-12') during BCP RIR
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 6 of 20	S	0-2'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	0	0	0	0	0			0	Interval previously characterized by analysis of Sample MNTC-3 (8-10') during BCP RIR
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 7 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 8 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 9 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 10 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1		1	1	Demonstrate soil quality
		13-15'	1	1	1	1	1	1		2	Demonstrate soil quality meets a Track 2 Cleanup
Boring 11 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 12 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 13 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 14 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 15 of 20	S	2-4'	1	1	1	1	1		1	1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 16 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 17 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 18 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1	1		2	Demonstrate soil quality meets a Track 2 Cleanup
Boring 19 of 20	S	2-4'	1	1	1	1	1			1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Boring 20 of 20	S	2-4'	1	1	1	1	1		1	1	Demonstrate soil quality below excavation of 0-2' bgs
		7-9'	1	1	1	1	1			1	Demonstrate soil quality
		13-15'	1	1	1	1	1			1	Demonstrate soil quality meets a Track 2 Cleanup
Total Soil Samples										61	

MS: Matrix Spike

MSD: Matrix Spike Duplicate (includes a field duplicate)

One trip blank will be analyzed per shipment for VOCs only

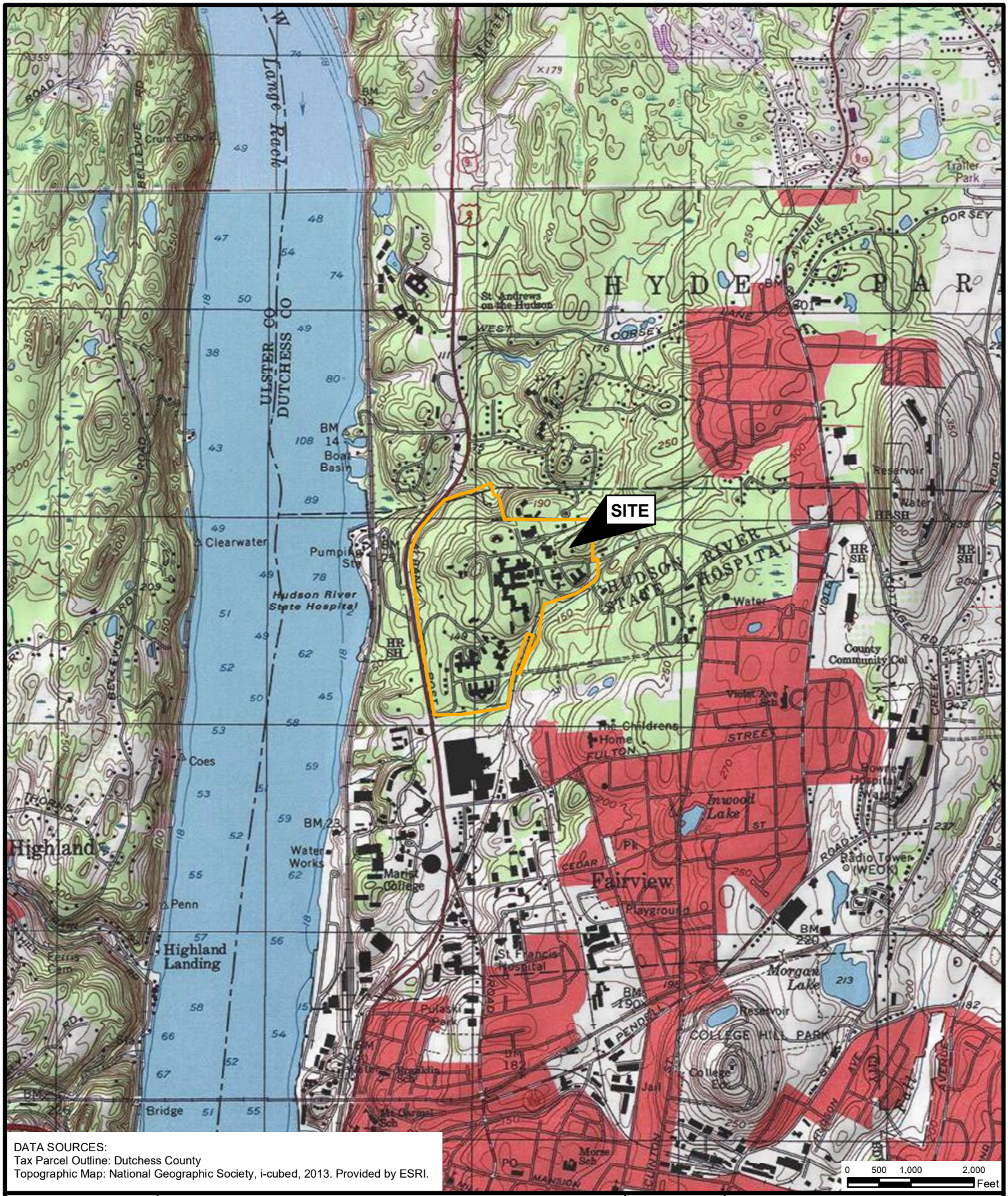
*QA/QC samples will be analyzed for the same parameters as the parent sample, except Trip Blanks which will only be analyzed for VOCs

Metals: 6000/7000
VOCs: 5035/8260
SVOCs: 8270
Pesticides: 8081
PCBs: 8082
EC's: PFAS and 1,4-Dioxane, as defined by NYSDEC-approved EC Sampling and Analysis Plan

FB: Equipment Field Blank
S: Soil
GW: Ground Water

Note: The sample depths described above are not final. Final sampling depths will be based upon findings in the field.

FIGURE 1 – SITE LOCATION MAP



DATA SOURCES:
Tax Parcel Outline: Dutchess County
Topographic Map: National Geographic Society, i-cubed, 2013. Provided by ESRI.

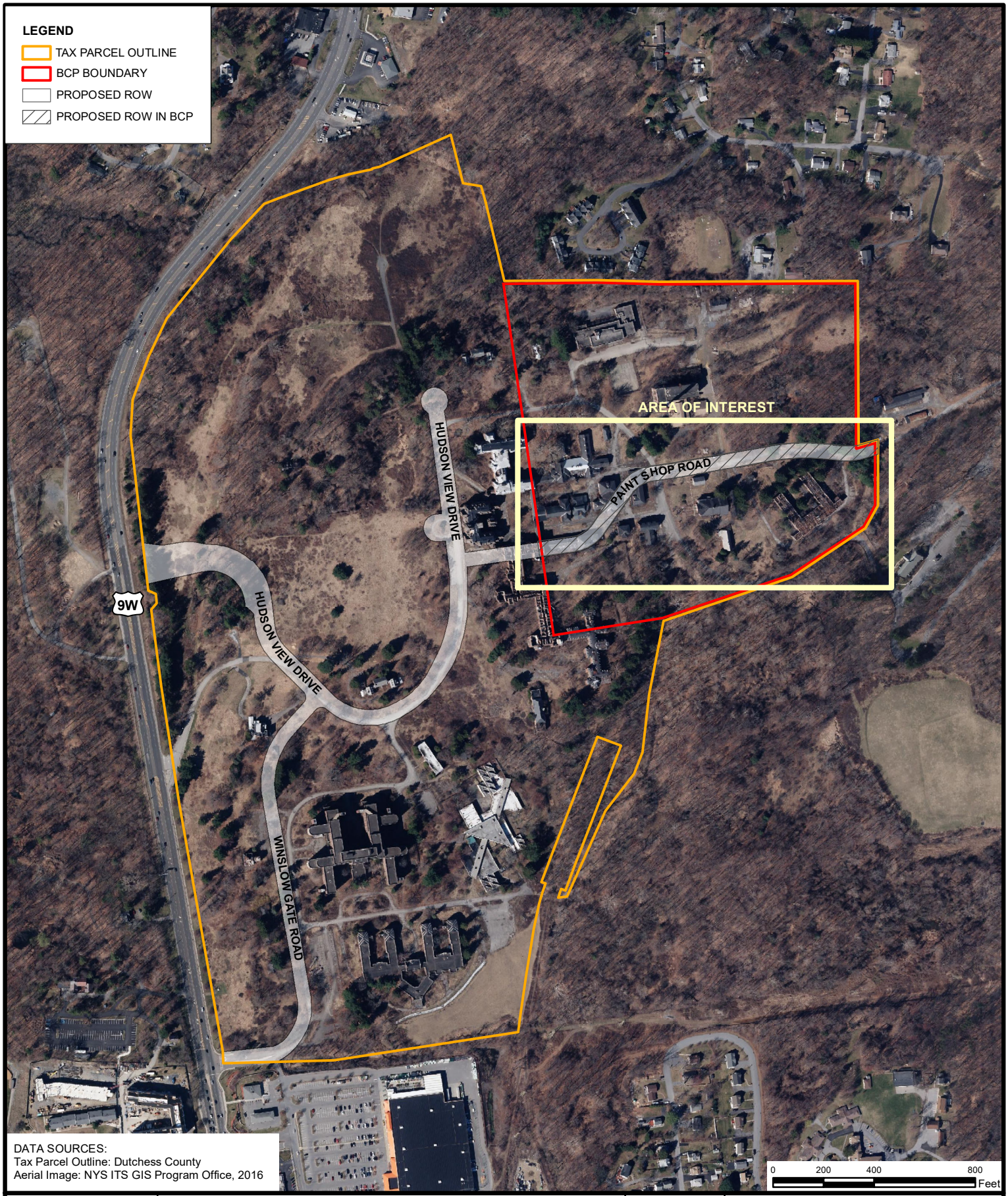
PVE
48 Springside Avenue
Poughkeepsie, NY 12603
Office: 845.454.2544
Fax: 845.454.2655

SITE LOCATION MAP

PROPOSED RIGHT OF WAY
HUDSON RIVER PSYCHIATRIC CENTER
TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK

PROJECT NO. 560909	FIGURE 1
	DATE: 12/09/2019
	SCALE: AS INDICATED
	PROJECTION: NAD83 STATE PLANE NY EAST
	ALL LOCATIONS APPROXIMATE

FIGURE 2 – SELECTED SITE FEATURES



PVE
48 Springside Avenue
Poughkeepsie, NY 12603
Office: 845.454.2544
Fax: 845.454.2655

SELECTED SITE FEATURES

PROPOSED RIGHT OF WAY
HUDSON RIVER PSYCHIATRIC CENTER
TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK

PROJECT NO. 560909

FIGURE 2

DATE: 12/19/2019

SCALE: AS INDICATED

PROJECTION: NAD83 STATE PLANE NY EAST

ALL LOCATIONS APPROXIMATE

FIGURE 3 – SAMPLE LOCATIONS

DATA SOURCES:
Proposed Lot Lines: The Chazen Companies. Obtained by PVE, LLC 01/30/2019.
Aerial Image: NYSITS GIS Program Office, 2016.

48 Springside Avenue
Poughkeepsie, NY 12603
Office: 845.454.2544
Fax: 845.454.2655

SAMPLE LOCATIONS

PROPOSED RIGHT OF WAY
HUDSON RIVER PSYCHIATRIC CENTER
TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK

LEGEND

SAMPLES EXCEEDING RRSCOS
- SURFACE AND SUBSURFACE SOIL

SAMPLES NOT EXCEEDING RRSCOS
- SOIL VAPOR
- SURFACE SOIL
- SUBSURFACE SOIL

- PROPOSED ROW
- PROJECT AREA
- BCP AREA BOUNDARY

PROJECT NO. 560909

FIGURE 3

DATE: 12/09/2019

SCALE: AS INDICATED | **DATUM:** NAD83

PROJECTION: STATE PLANE NY EAST (FT)

ALL LOCATIONS APPROXIMATE

FIGURE 4 – IRM BORING LOCATIONS

DATA SOURCES:
Proposed Lot Lines: The Chazen Companies. Obtained by PVE, LLC 01/30/2019.
Aerial Image: NYSITS GIS Program Office, 2016.

48 Springside Avenue
Poughkeepsie, NY 12603
Office: 845.454.2544
Fax: 845.454.2655

PROPOSED BORING LOCATIONS

PROPOSED RIGHT OF WAY
HUDSON RIVER PSYCHIATRIC CENTER
TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK

LEGEND

SAMPLES EXCEEDING RRSCOS
- SURFACE AND SUBSURFACE SOIL

SAMPLES NOT EXCEEDING RRSCOS
- SOIL VAPOR
- SURFACE SOIL
- SUBSURFACE SOIL

PROPOSED BORINGS
- PROPOSED BORING LOCATION
- PROPOSED ROW IN BCP AREA
- BCP AREA BOUNDARY

PROJECT NO. 560909

FIGURE 4

DATE:	12/20/2019
SCALE: AS INDICATED	DATUM: NAD83
PROJECTION: STATE PLANE NY EAST (FT)	

ALL LOCATIONS APPROXIMATE

FIGURE 5 – SOIL MANAGEMENT AREA

LEGEND:

EXISTING CONDITIONS:

- PROPERTY LINE NO PHYSICAL BOUNDS
- ADJACENT PROPERTY LINE
- 110 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ×500.5 — EXISTING SPOT GRADE
- EXISTING PROPERTY EASEMENT
- EXISTING BUILDING
- CONC. CURB — EXISTING CURB/GUTTER
- GRAVEL — EXISTING GRAVEL DRIVEWAY
- EXISTING GUIDERAIL
- EXISTING FENCE
- EXISTING STONE WALL
- EXISTING POND/LAKE
- EXISTING TREE LINE
- EXISTING BRUSH LINE
- OHW — EXISTING OVERHEAD WIRES
- W — EXISTING WATER LINE
- G — EXISTING GAS LINE
- UE — EXISTING UNDERGROUND ELECTRIC LINE
- UT — EXISTING UNDERGROUND COMMUNICATIONS LINE
- SC — EXISTING UNDERGROUND STEAM CONDUIT
- HW — EXISTING UNDERGROUND HOT WATER LINE
- C — EXISTING UNDERGROUND CABLE LINE
- U — EXISTING UNKNOWN UNDERGROUND LINE
- S — 8"SAN — EXISTING UNDERGROUND SEWER LINE
- ST — 12"RCP — EXISTING UNDERGROUND STORM LINE

SYMBOLS:

- EXISTING SIGN
- EXISTING SIGN
- RMK — EXISTING REFLECTOR MARKER
- MM — EXISTING MILE MARKER
- EXISTING BOLLARD
- EXISTING FLAGPOLE
- MB — EXISTING MAILBOX
- PST — EXISTING POST
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING TREE STUMP
- EXISTING SHRUB
- EXISTING MONUMENT
- IPF — EXISTING IRON PIPE FOUND
- IRF — EXISTING IRON ROD FOUND
- CIRF — EXISTING CAPPED IRON ROD
- CIRS — EXISTING CAPPED IRON ROD SET
- EXISTING BENCHMARK
- EXISTING SANITARY MANHOLE
- EXISTING CLEANOUT
- EXISTING DRAINAGE MANHOLE
- EXISTING CATCH BASIN
- EXISTING YARD DRAIN
- ES — EXISTING END SECTION
- RL — EXISTING ROOF DRAIN LEADER
- EXISTING ELECTRIC MANHOLE
- EXISTING ELECTRIC HAND HOLE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING GUY WIRE
- EXISTING UTILITY POLE
- EXISTING UTILITY POLE W/ LIGHT
- EXISTING LIGHT POLE
- EXISTING PANEL/SWITCH BOX
- EXISTING CONDUIT TO/FROM UNDERGROUND
- GAS — EXISTING GAS METER
- EXISTING GAS STRUCTURE
- EXISTING GAS VALVE
- EXISTING GAS LINE MARKER
- EXISTING WATER MANHOLE
- EXISTING WELL
- EXISTING HYDRANT
- SPK — EXISTING AUTO SPKLR. HYDRANT
- EXISTING WATER SHUT OFF VALVE
- EXISTING WATER VALVE
- EXISTING SPRINKLER HEAD
- EXISTING TELEPHONE LINE MARKER
- EXISTING TELEPHONE MANHOLE
- EXISTING TELEPHONE PEDESTAL
- EXISTING UNKNOWN MANHOLE
- EXISTING MONITORING WELL
- EXISTING UTILITY VALVE
- VENT — EXISTING VENT
- PROPOSED SOIL MANAGEMENT AREA

PROPOSED SOIL MANAGEMENT AREA

0 30' 60'

Drawing Scale: 1" = 30'

NORTH

PRELIMINARY

Waterfront Corporate Park III, Suite 101
2000 Georgetowne Drive
Sewickley, PA 15143
P: 724-444-1100
F: 724-444-1104
www.pve-llc.com

PVE
Civil Engineering | Land Development | Structure Design
Land Planning | Landscape Architecture | Environmental

Prepared For:

EFG/DRA HERITAGE, LLC
4601 DTC Boulevard, Suite 120
Denver, CO 80237

811 Know what's **below.** **Call** before you dig.
POCS SER. # ---------

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

DATE ISSUED: JANUARY 10, 2020

PLAN REVISIONS

	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Situate In:
Town of Poughkeepsie, Dutchess County, New York

Project Name:
Hudson River Psychiatric Center

Drawing Name:
SOIL MANAGEMENT AREA

Project No: 560909

Drawing No: FIGURE 5

APPENDIX A – QAPP

QUALITY ASSURANCE PROJECT PLAN

HUDSON RIVER PSYCHIATRIC CENTER
3532 North Road
TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK

PREPARED FOR:

EFG/DRA Heritage, LLC

PREPARED BY:

48 Springside Avenue
Poughkeepsie, NY 12601
Phone: 845-454-2544 - Fax: 845-454-2655

January 2020

PVE File #560909

TABLE OF CONTENTS

TABLES

ATTACHMENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of Remedial Action, including the Interim Remedial Measure Work Plan (IRMWP) in the North BCP Area located in the Town of Poughkeepsie, Dutchess County, New York. The objective of the QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) of environmental investigative, sampling and remedial activities conducted in accordance with the IRMWP (and other remedial work plans) prepared by PVE personnel (PVE). Adherence to the QAPP will ensure that defensible data will be obtained during the investigation and remediation.

If any changes are made to the QAPP, these changes will be submitted to the appropriate parties and referenced in all reports.

2.0 PROJECT TEAM

The project team will be drawn from PVE professional and technical personnel and PVE's subcontractors. All field personnel and subcontractors performing invasive field activities outlined in the Remedial Investigation Work Plan will have completed a 40-hour training course and updated 8-hour refresher course that meet the Occupational Safety and Health Administration (OSHA) requirements of 29 CFR Part 1910. The following sections describe the key project personnel and their responsibilities.

2.1 PROJECT DIRECTOR

The project director will be responsible for the general oversight of all aspects of the project, including scheduling, budgeting, data management, and decision-making regarding the field program. The project director will communicate regularly with all members of the PVE project team and the New York State Department of Environmental Conservation (NYSDEC) to ensure a smooth flow of information between involved parties. Christopher Brown will serve as the project director for the IRMWP; his resume is included in Attachment A.

2.2 PROJECT MANAGER

The project manager will be responsible for directing and coordinating all elements of the IRMWP. They will prepare reports and participate in meetings with the Site owner and/or the NYSDEC. Conor Tarbell will serve as the project manager for the IRMWP.

2.3 FIELD TEAM LEADER

The field team leader will be responsible for supervising the daily sampling and health and safety activities in the field and will ensure adherence to the work plan and HASP. This person(s) will report to the Project Manager on a regular basis regarding daily progress and any deviations from the work plan. The field team leader will be a qualified, responsible person, able to act professionally and promptly during soil disturbing activities. Anthony Spadaveccia will be the field team leader for the IRMP.

2.4 PROJECT QUALITY ASSURANCE/QUALITY CONTROL OFFICER

The Quality Assurance/Quality Control (QA/QC) Officer will be responsible for adherence to the QAPP. They will review the procedures with all personnel prior to commencing any fieldwork and will assess implementation of the required procedures. Erik Draijer will serve as the QA/QC officer for the IRMWP.

2.5 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL OFFICER

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. He/she will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued. He/she will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be determined upon selection of a contract laboratory(s) for the IRMWP.

2.6 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall objectives and criteria for assuring quality for this effort are discussed below. This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented. The objectives of this QAPP are to address the following:

- The procedures to be used to collect, preserve, package, and transport groundwater samples;
- Field data collection;
- Record keeping;
- Data management;
- Chain-of-custody procedures;
- Precision, accuracy, completeness, representativeness, decision rules, comparability, and level of quality control effort conformance for sample analysis and data management by the laboratory under EPA analytical met.

3.0 STANDARD OPERATING PROCEDURES

The following sections describe the standard operating procedures (SOPs) for the investigative activities included in the IRMWP. During these operations, safety monitoring will be performed as described in the project Health and Safety Plan (HASP) and all field personnel will wear appropriate personal protective equipment (PPE). The IRM will include soil sampling to characterize general soil quality within the proposed Right of Way (ROW).

3.1 SOIL SAMPLING

3.1.1 Soil Borings and Surface Soil Sampling

Soil borings and soil sampling will be completed to characterize shallow and deeper subsurface soils within the Right of Way (ROW) and to collect soil samples for laboratory analysis. Figures in the IRMWP depict the proposed soil boring locations and the locations of existing structures present at the site.

Soil samples will be collected using a Geoprobe direct-push drilling rig. Continuous soil samples will be collected by driving a macro-core sampling tube into the subsurface at five-foot intervals until the target depth (15 feet bgs). An acetate liner fitted within the macro-core sampler will be removed after each sampling interval and cut lengthwise to access the soil sample for logging, screening, and laboratory sampling.

Logging will consist of:

- Describing the soil according to the Unified Soil Classification System;
- Describing evidence of contamination (e.g., non-aqueous phase liquid (NAPL), staining, sheens, odors); and
- Screening for organic vapors using a photoionization detector (PID).

The soil samples designated for analysis will be collected into laboratory-supplied containers, sealed and labeled, and placed in an ice-filled cooler. Proposed soil samples and analyses are described in the "Sample Summary Table" of the Remedial Investigation Work Plan. The samples will be analyzed in a laboratory following New York State Department of Health (NYSDOH) Analytical Services Protocol (ASP) Category B deliverables.

3.1.2 Restoration

Upon completion of probing/drilling, each boring will be filled to the near grade surface with either the drill cuttings or a cement/bentonite grout mixture (if gross contamination is identified). Soil borings filled with soil cuttings will be completed to ground surface using drilling sand, if necessary. The borings will be patched with the appropriate materials (e.g., asphalt or concrete patch), depending on the original finish.

3.2 DECONTAMINATION OF SAMPLING EQUIPMENT

All non-disposable sampling equipment (Geoprobe rods, macro core samplers, sampling spoons, etc.) will be decontaminated between sampling locations. The decontamination procedure will be as follows:

1. Scrub using tap water/Alconox mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with tap water/Alconox and bristle brush.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment, if possible.

Decontamination will be conducted within 5-gallon buckets to capture decontamination water. Decontamination waste will be handled as described in Section 3.4.

If deemed necessary, a methanol solution and/or a 10% nitric acid solution will be included in the decontamination procedure.

3.2.1 Decontamination of Sampling Equipment and Supplies for Collection of Samples for Analysis of PFAS

PVE field technicians responsible for the collection of samples for PFAS analysis have been trained to follow industry practices which will minimize the introduction of "background" concentrations of PFAS. These procedures begin with morning routine, including showering, clothing selection, proper decontamination procedures and selection of appropriate sampling equipment.

Prohibited Equipment:

Many industry standard sampling/field materials utilized during environmental investigations contain PFAS. The following materials will not be utilized when conducting sampling for PFAS:

- Teflon – containing materials (bailers, tubing, tape, plumbing paste)
- Low Density Polyethylene (LDPE)
- Waterproof coatings/clothing containing PFAS
- Food containers/prepackaged food container
- Fluorinated ethylene propylene (FEP)
- Ethylene tetrafluoroethylene (ETFE)
- Samples shall not be stored in containers made of LDPE materials
- Waterproof field books (field notes should be documented on loose paper on aluminum clipboards)
- Sharpies/markers (only pens should be utilized)
- Post-It Notes
- Anything with "fluoro" in the name

PVE will utilize disposable equipment during collection of groundwater samples for analysis of PFAS. If field equipment re-use is required, decontamination in accordance with Section 2.3 (Alconox and Liquinox soap) is an acceptable means of decontamination.

3.2.2 Field Clothing & Personal Protective Equipment (PPE) for Collection of Samples for Analysis of PFAS

Several waterproof coatings contain PFAS (including Gore-tex treated PPE, waterproof papers). However, some products are waterproofed with acceptable materials such as polyurethane, rubber and PVC. The following materials will not be utilized during sample collection:

- Water resistant, waterproof, or stain-treated clothing;
- Gore-Tex (consists of a PFC membrane);
- Coated Tvyek clothing/suits;
- Rain gear made from polyurethane and wax-coated materials;
- New or unwashed clothing;
- Clothing washed in fabric softeners.

Field personnel shall refrain from using cosmetics, hand cream, etc. as part of their personal routine on the morning of a sampling event. Sunblock and insect repellants that contain PFCs shall not be utilized or brought on-site.

3.2.3 Decontamination of Sampling Equipment for Collection of Samples for Analysis of PFAS

Prior to field work, and arrival at the field site, all non-disposable sampling equipment will be either dedicated or decontaminated and stored separately from other materials and sampling tools which have not been prepared for PFAS sampling sites. The decontamination procedure will be as follows:

1. Scrub using PFAS-free water/Alconox mixture and bristle brush.
2. Rinse with PFAS-free water.

3. Scrub again with PFAS-free water/Alconox and bristle brush.
4. Rinse with PFAS-free water.
5. Air-dry the equipment, if possible.

Decontamination will be conducted within HDPE or stainless-steel containers to capture decontamination water.

3.3 MANAGEMENT OF INVESTIGATION DERIVED WASTE

Investigation derived wastes (IDW) will be minimized by returning excess soil from soil borings to its original location unless grossly contaminated, as per DER-10(3.3)(e). Decontamination fluids will be discharged to the ground surface unless gross contamination is identified during the field program. If field evidence of gross contamination is identified, soil cuttings and decontamination wastewater will be drummed and staged near the point of generation, and will be properly disposed of based on laboratory results. If free of visible contamination, disposable personal protective equipment (PPE) and sampling equipment (scoops, gloves, rope, etc.) will be placed in heavy-duty plastic bags and disposed of properly as general refuse.

4.0 SAMPLING AND LABORATORY PROCEDURES

4.1 SOIL SAMPLING

Soil sampling will be conducted according to the following procedures:

- Characterize the sample according to the modified Unified soil classification system.
- Field screening for evidence of contamination (e.g., odors, staining, elevated PID measurements). Create small holes in the core at one-foot intervals using a sampling spoon (or similar) and place the PID probe in the hole to obtain an organic vapor concentration measurement.
- After selecting which samples will be analyzed in the laboratory, fill the required laboratory-supplied sample jars with the soil from the selected sampling location. Seal and label the sample jars as described in Section 4.5 of this QAPP and place in an ice-filled cooler.
- Decontaminate any soil sampling equipment between sample locations as described in Section 3.4 of this QAPP.
- Record boring number, sample depth, and sample observations (evidence of contamination, PID readings, soil classification) in field log book and boring log data sheet, if applicable.

4.2 LABORATORY METHODS

Table 1 summarizes the laboratory methods that will be used to analyze field samples as well as the sample container type, preservation, and applicable holding times. An ELAP Certified laboratory will be used for all chemical analyses in accordance with DER-10 2.1(b) and 2.1(f), including Category B Deliverables. VOC and PFAS analyses will be conducted at a laboratory which has been designed to eliminate cross-contamination from other interfering analytes

Table 1 Laboratory Analytical Methods for Analysis Groups

Matrix	Analysis	EPA Method	Bottle Types	Preservative	Hold Time
Soil	TCL VOCs	8260	5035 Kit	4°C	48 house to analyze unpreserved, or preserve and 14 days to analyze
Soil	TCL SVOCs	8270	Glass 4 oz. jar	4°C	48 house to analyze unpreserved, or preserve and 14 days to analyze
Soil	TAL Metals	6010/6020	Glass 4 oz. jar	4°C	6 months (28 days for Hg)
Soil	Pesticides	8081	Glass 4 oz. jar	4°C	14 days to extract, 40 days to analyze
Soil	PCBs	8082	Glass 4 oz. jar	4°C	14 days to extract, 40 days to analyze
Soil	PFAS and 1, 4-Dioxane	537M	HDPE 4 oz. Container	4°C	14 days to extract, 40 days to analyze

4.3 QUALITY CONTROL SAMPLING

In addition to the laboratory analysis of the investigative soil samples, additional analyses will be included for quality control measures, as required by the Category B sampling techniques. These samples will include field blanks, trip blanks, matrix spike/matrix spike duplicates (MS/MSD), and duplicate/blind duplicate samples at a frequency of one sample per 20 field samples collected. The "Sample Summary Table" in the RI Work Plan provides a summary of the field samples and QA/QC samples to be analyzed by the laboratory.

4.4 SAMPLE HANDLING

4.4.1 Sample Labeling and Shipping

All sample containers will be provided with labels containing the following information:

- Project identification
- Sample identification
- Date and time of collection
- Analysis(es) to be performed

Once the samples are collected and labeled, they will be placed on ice in coolers. The samples will be shipped with chain-of-custody (COC) forms. Samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier.

4.4.2 Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on COC forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; and signatures of individuals involved in sample transfer, and the dates and times of transfers.

4.5 FIELD INSTRUMENTATION

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file for referencing proper operation, maintenance and calibration procedures.

4.6 DATA REVIEW

In accordance with DER-10, each of the samples collected as part of the RI will undergo a third party data review process to ensure the usability of the data collected. Data usability summary reports (DUSR) documenting any issues with QA/QC will be prepared and included in the RI Report.

4.6.1 Data Usability Evaluation

Data usability evaluation procedures shall be performed for both field and laboratory operations as described below.

4.6.2 Procedures Used to Evaluate Field Data Usability

Procedures to validate field data for this project will be facilitated by adherence to the plan outlined in the QAPP. The performance of all field activities, checking for transcription errors and review of field log books is the responsibility of the Field Team Leader.

4.6.3 Procedures Used to Evaluate Laboratory Data Usability

Data evaluation will be performed by the third-party data validator using the most current methods and quality control criteria from the USEPA's Contract Laboratory Program (CLP) *National Functional Guidelines for Organic Data Review* (Ref. 8), and Contract Laboratory Program*, National Functional Guidelines for Inorganic Data Review* (Ref. 9). The data review guidance will be used only to the extent that it is applicable to the SW-846 methods; SW-846 methodologies will be followed primarily and given preference over CLP when differences occur. Also, results of blanks, surrogate spikes, MS/MSDs, and laboratory control samples will be reviewed/ evaluated by the data validator. All sample analytical data for each sample matrix shall be evaluated. The third-party data validation expert will also evaluate the overall completeness of the data package. Completeness checks will be administered on all data to determine whether deliverables specified in this QAPP are present. The reviewer will determine whether all required items are present and request copies of missing deliverables

APPENDIX B – HASP

HEALTH AND SAFETY PLAN

FORMER HUDSON RIVER PSYCHIATRIC CENTER

EFG/DRA HERITAGE, LLC

BROWNFIELD CLEANUP PROGRAM
3532 North Road
Poughkeepsie, New York 12603
NYSDEC # C314121

Prepared by: PVE Engineering Date: December 2019

Approved by: _____ Date: December 2019
Health and Safety Manager

Approved by: Conor Tarbell Date: December 2019
Project Manager

EMERGENCY REFERENCES:

Ambulance:	Notify 911
Fire:	Notify 911
Police:	Notify 911
Hospital:	**SAINT FRANCIS MEDICAL CENTER** North Road Poughkeepsie, NY 12603

Table of Contents

Table of Contents (cont'd.)

Page

1.0 Introduction

1.1 HASP Applicability

This site-specific Health and Safety Plan (HASP) has been developed by PVE, LLC and establishes the health and safety procedures to minimize potential risks to personnel involved with the Interim Remedial Measure (IRM) activities at the former Hudson River Psychiatric Center (HRPC - the Site) located at 3532 North Road, Poughkeepsie, New York. This HASP applies to all personnel potentially exposed to safety and/or health hazards related to the activities described in Section 3.0 of this document.

This HASP has been prepared to comply with the applicable requirements of the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120). Activities covered by this HASP must be conducted in complete compliance with this HASP and with all applicable Federal, State, and local health and safety regulations. Personnel covered by this HASP who cannot or will not comply will be excluded from site activities.

This HASP will be distributed to each person involved with investigative activities at the site. Each person must sign a copy of the attached HASP Receipt and Acceptance Form (see Attachment A).

1.2 Organization/Responsibilities

The implementation of health and safety at this project location will be the shared responsibility of the Project Manager (PM), the Health and Safety Manager (HSM), the Project Site Safety Officer (SSO) and all other personnel who conduct activities at the site.

- Project Manager (PM): Conor Tarbell.
- Health and Safety Manager (HSM):
- Project Site Safety Officer (SSO): Anthony Spadavecchia.

1.2.1 Project Manager (PM)

The Project Manager (PM) has the primary responsibility for ensuring the overall health and safety of this project. As such, the PM is responsible for ensuring that the requirements of this HASP are implemented. Some of the PM's specific responsibilities include:

- Ensuring that all personnel to whom this HASP applies have received a copy of it;
- Providing the SSO with updated information regarding environmental conditions at the site and the scope of site work;
- Providing adequate authority and resources to the on-site SSO to allow for the successful implementation of all necessary safety procedures;
- Supporting the decisions made by the SSO;
- Maintaining regular communications with the SSO; and
- Coordinating the activities of all subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project.

1.2.2 Health and Safety Manager (HSM)

The Health and Safety Manager (HSM) is responsible for the preparation, interpretation and modification of this HASP. Modifications to this HASP which may result in less stringent precautions cannot be undertaken by the SSO without the approval of the HSM. Specific duties of the HSM include:

- Writing, approving and amending the HASP for this project;
- Advising the SSO on matters relating to health and safety on this site;
- Recommending appropriate personal protective equipment (PPE) and air monitoring instrumentation to protect personnel from potential site hazards; and
- Maintaining regular contact with the SSO to evaluate site conditions and new information which might require modifications to the HASP.

1.2.3 Site Safety Officer (SSO)

All field technicians are responsible for implementing the safety requirements specified in this HASP. One (1) technician will be designated to serve as the Site Safety Officer (SSO). The SSO will be appointed by the PM. The SSO will be on-site during all activities covered by this HASP. The SSO is responsible for enforcing the requirements of this HASP once work begins. The SSO has the authority to immediately correct all situations where non-compliance with this HASP is noted and to immediately stop work in cases where an immediate danger is perceived. Some of the SSO's specific responsibilities include:

- Ensuring that all personnel to whom this HASP applies have submitted a completed copy of the HASP Receipt and Acceptance Form (see Attachment A);
- Ensuring that all personnel to whom this HASP applies have attended a pre-entry briefing prior to entering the work zone;
- Maintaining a high level of health and safety consciousness among employees at the work site;
- Procuring and distributing the PPE needed for personnel involved with this project;
- Procuring the air monitoring instrumentation required and performing air monitoring for field activities;
- Verifying that all PPE and health and safety equipment is in good working order;
- Setting up and maintaining the work zones and ensuring proper cleanup of all site personnel;
- Notifying the PM of all non-compliance situations and stopping work in the event that an immediate danger situation is perceived;
- Monitoring and controlling the safety performance of all personnel within established restricted areas to ensure that required safety and health procedures are being followed;
- Conducting accident/incident investigations and preparing accident/incident investigation reports;
- Conducting the pre-entry briefing as required by Section 10.3 of this HASP; and
- Initiating emergency response procedures in accordance with Section 11.0 of this HASP.

1.2.4 Field Personnel and Covered Subcontractor Personnel

All field personnel covered by this HASP are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Reading this HASP in its entirety prior to the start of on-site work;
- Submitting a completed HASP Receipt and Acceptance Form (see Attachment A) and documentation of medical surveillance and training to the PM prior to the start of work;
- Attending the required pre-entry briefing prior to beginning on-site work;
- Bringing forth any questions or concerns regarding the content of this HASP to the PM or the SSO prior to the start of work;
- Reporting all accidents, injuries and illnesses, regardless of their severity, to the SSO; and
- Complying with the requirements of this HASP and the requests of the SSO.

1.2.5 Contractors

In addition to other requirements referenced in this HASP, all contractors are required to:

- Provide appropriate PPE for their employees;
- Ensure, via daily inspections, that their equipment is maintained in good working condition;
- Operate their equipment in a safe manner; and
- Appoint an on-site safety coordinator to interface with the SSO.

1.3 Modification of this HASP

The procedures in this HASP have been developed based on general knowledge of the site, proposed tasks, and anecdotal information from previous investigations at the site. Should additional information become available regarding potential on-site hazards, it may be necessary to modify this HASP. All proposed modifications to this HASP must be reviewed and approved by the HSM before such modifications are implemented.

Any significant modifications must be incorporated into the written document as addenda and the HASP must be re-issued. The PM will ensure that all personnel covered by this HASP receive copies of all issued addenda. Sign-off forms will accompany each addendum and must be signed by all personnel covered by the addendum. Sign-off forms will be submitted to the PM. The HASP addenda will be distributed during the regularly scheduled meetings so that they can be reviewed and discussed. Attendance forms will be collected during the meeting.

2.0 Site Description and History

Site Location and Current Usage

The Site is located at 3532 North Road in the Town of Poughkeepsie, Dutchess County, New York and is identified as Block 3and Lot 11149 on the Town of Poughkeepsie Tax Map. Figure 1 shows the Site location. The Site is approximately 156 acres and is bounded by North Road to the west and commercial property to the east. Residential properties are located to the north and commercial properties to the south. A map of the site boundary is shown in Figure 2. Currently, the Site is vacant but was previously used as the Hudson River Psychiatric Center. Previously operated hosipital facilities remain, but are all vacant.

Summary of Proposed Redevelopment Plan

The EFG/DRA Heritage, LLC project is located on lands of the former New York State Hudson River Psychiatric Center in Poughkeepsie, approximately 2.5 miles south of the historic home of Franklin D. Roosevelt. Construction of the historic hospital began in 1868 with the iconic Kirkbridge-style main building, which was designated a National Historic Landmark in 1989. The grounds were designed by the world-renown landscape architect, Fredrick Law Olmsted, and at the peak of its operation the hospital treated over 6,000 patients. The hospital ceased to operate in the 1990s and the state divested the property in the years that followed. Over the decade since cessation of operations, the historic buildings and grounds have deteriorated, with some structures destroyed by fire.

Project plans call for the preservation of the historically significant structures and demolition of the remaining dilapidated buildings in preparation for a mixed commercial/residential development. The project is spatially divided between the northern and southern portions of the property, with the commercial center to be developed in the south and a multi-family residential development (predominantly townhomes) in the north.

Summary of Past Uses of Site and Areas of Concern (AOC)

Historically, the Site has been operated as a hospital campus, with over 50 on site buildings.

The AOCs identified for this site include:

North Area

- Car Wash and Floor Drains (B-Wing of Building 51)
- Automotive Garage and Floor Drains (Building 99)
- Power House (Building 33)
- Drum Storage Areas (Building 33 and area surrounding Building 99)

South Area

- Lead in Soil from Hazardous Materials
- Possible Underground Storage Tanks

- Possible SVOCs from Atmospheric Deposition
- Residual PCBs near former Landfill Area 6

Summary of the Work Performed Previously

The EFG/DRA Heritage, LLC property has been the subject of several episodes of environmental evaluation and physical testing. A summary of results is presented below, with copies of reports provided in Attachments 7, 8, 9, 10 and 11. While the studies identified issues of potential concern in different areas of the property, only those conditions observed/measured in the northern portion of the site (the subject of the BCP application) are elaborated upon here.

1. Previous Investigations and Reports

Available file documents include two ASTM-compliant Phase I Environmental Site Assessments (ESA), a tank closure report and a report describing focused environmental testing (Phase II assessment following the 2013 ESA). The findings documented in these reports are described below.

1996 Phase I ESA

The 1996 Phase I ESA was prepared in accordance with ASTM Standard E 1527-94 and is provided in Attachment 7. The following Recognized Environmental Conditions (RECs) were identified in the northern portion of the property (the proposed BCP site) during preparation of this Phase I ESA.

- Nine USTs were reported in this document, it is unclear how many were located on the proposed Brownfield site.

- Building 99, the former automotive repair facility, was reported to be off the subject property for this Phase I ESA. This building is actually located on the proposed Brownfield site along the northerly boundary. A floor-drain was reported in the 1996 ESA at this location, and the discharge location was unknown.

- The 1996 report indicated that lead-based paint and significant quantities of asbestos-containing materials were suspected to be present in site structures.

2011 Aboveground Storage Tank Closure Report

In January of 2011, seven aboveground fuel storage tanks (ASTs) were decommissioned and removed from the Hospital Property. The report is provided in Attachment 9.

Three of these tanks were located in the immediate vicinity of the former Power House, and within the proposed Brownfield property:

- One 4,000-gallon diesel fuel AST (Tank #6-33)
- Two 126,000-gallon. #6 fuel oil ASTs (Tanks #1 and #2).

Tanks were cleaned, cut, and removed from the site for scrap metal by Scavo Contracting Corp and transported to Millens Recycling of Poughkeepsie New York.

The 4,000-gallon AST was located on top of a concrete pad. No evidence of leakage or spillage was observed during decommissioning of this tank. The 126,000 gallon ASTs were removed from a diked-containment area with an earthen bottom. Soil within the containment area appeared to have been impacted with petroleum. A spill was reported to NYSDEC on January 28, 2011, and file # 1011010 was assigned. Samples of surface soil were collected from each tank area and analyzed for the STARs lists of volatile and semi-volatile organic compound (VOCs and SVOCs). Analytical results are presented in Attachment 8. Soil samples contained VOCs and SVOCs at concentrations exceeding applicable standards, results are summarized below. The spill was closed by NYSDEC on August 11, 2011, as "closed – not meeting standards".

Sample (T-1)

1,2,4-Trimethylbenzene	9,600 ug/kg
Total Xylenes	1,300 ug/kg
Chrysene	2,500 ug/kg

Sample (T-2)
No VOCs or SVOCs Detected

2013 Phase I ESA

The 2013 Phase I ESA was prepared by PSI and in accordance with ASTM Standard E-1527-05 and is provided in Attachment 9. The following RECs were reported in the 2013 ESA:

- A plugged floor drain was observed in bottom of the concrete service pit at the auto garage (Building 99). Some staining was observed on the pit floor and the discharge location of this drain was not known.

- Multiple drains were observed in the car-wash bay in B-Wing in Main Building (Building 51). The discharge point of these drains was not known.

- A coal storage pile was previously present adjacent to the former Power House (Building 33). Coal storage piles have the potential leach heavy metals into the underlying soil and groundwater and can potentially contaminate storm water.

- The previous 1996 Phase I ESA identified an area of stained surface soil and approximately 15 waste oil drums within the storage sheds surrounding Building 33. This area was not accessible during the inspection for the 2013 ESA, however the preparer of the document indicates the drums had been removed. The stained soil from the previous ESA was considered to be a REC.

Two petroleum spills were reported in the 2013 ESA as being listed as "closed - not meeting standards". This designation is applied by NYSDEC to spill locations where contaminants are present in soil and/or groundwater at concentrations which exceed applicable standards, but NYSDEC is satisfied with the extent of remediation.

- Spill #0003132: A petroleum release was reported at the time a 2,000 gallon #2 fuel oilUST was being tightness tested. Petroleum contaminated soil was identified during the decommissioning of this tank, the location of which is unknown.

- Spill #1011010: Petroleum contaminated soil was encountered in 2011 during the decommissioning of the aforementioned 126,000 gallon fuel oil tanks (Tanks #1 & 2) located near the former Power House (Building 33).

2013 Limited Site Investigation (Phase II)

The 2013 Phase II investigated the RECs identified in the PSI ESA (Attachment 10). Soil borings were completed in the vicinity of each of REC using a Geoprobe™. This investigation was deliberately limited in scope to determine the relative impact of suspected releases at each area of concern. These results demonstrate that site-relate operations resulted in an impact to local soil and groundwater. Although the concentrations of contaminants detected only moderately exceeds UUSCOs the potential for larger impacts to the site are real. A description of borings completed in each area and a summary of analytical results is presented below. Tabulated data are presented in Attachment 11, laboratory reports and are included in Attachment 10.

Power House and Former Coal Storage Area

A limited investigation was performed at the former Power House and coal storage area. Two soil borings were completed to depths of 5.0 to 7.0 below grade. Soil samples were screened with a PID, no elevated readings were observed. Soil samples from 6.0 to 7.0 feet were retained for laboratory analysis of the Target Analyte List (TAL) of metals. Arsenic, copper, manganese, nickel, and zinc were all detected above Unrestricted Use Soil Cleanup Objectives (UUSCOs).

Car Wash
A limited investigation was performed at the former Car Wash including a geophysical survey and soil borings. Two oil water separators (OWS) were located during the geophysical survey. Three borings were completed from ground surface to a maximum depth of 20 feet below grade. Soil samples were screened with a PID, no elevated readings were observed. Samples were analyzed for VOCs and SVOCs

The discharge location of the floor drain could not be determined. Acetone was detected in soil samples from 19-20 feet below grade; no SVOCs were detected. Wastewater samples collected from the oil-water separators contained elevated concentrations of VOCs and SVOCs. Wastewater discharged to the subsurface from the OWS could significantly impact local soil and/or groundwater (data are presented in Section 7.2, below).

Auto Garage
A floor drain and two lifts were observed in the former Auto Garage during Phase I ESA site inspections. Investigations in this area included a geophysical survey, 6 soil borings, 3 of which were converted to temporary monitoring wells. The geophysical survey could not establish the discharge location of the floor drain. Soil samples were screened with a PID, no elevated readings were observed. Groundwater samples were collected from temporary monitoring wells. Soil and groundwater samples were analyzed for VOCs, SVOCs and lead.

Acetone and other VOCs listed as Tentatively Identified Compounds (TICs) were detected in one soil sample. Soil samples did not contain elevated concentrations of SVOCs, lead or PCBs. Groundwater samples contained elevated concentrations of SVOCs and lead (in unfiltered samples).

Drum Storage Area
Four test pits were excavated by hand to a depth of approximately 1 foot below grade No odors or visual indication of contamination was identified and no samples were collected for laboratory analysis.

Cheney Hall PCB Release

A release of PCBs at the Cheney Building, within the proposed Brownfield site, was investigated and remediated by Lawler Matusky and Skelly Engineers, LLP (LMS) between 1995 and 1999 (Attachment 9).

The investigation identified PCBs in sediment samples collected from several areas of a stream which bordered the Landfill Area 6, immediately south of the proposed Brownfield site. PCB concentrations ranged from 0.4 to 390 mg/kg. PCBs were traced to a transformer leak in the vault room of the Cheney Building, located within the proposed Brownfield site. Floor drains in this vault room discharged to the stream adjacent to the landfill. LMS was retained by The Dormitory Authority of New York (DASNY) to remediate the release. Portions of the drains and contaminated sediments were excavated and remediated between 1995 and 1998. The PCB-contaminated floor of the vault room was removed in 1999. Soil samples from beneath the

original floor, and chip samples of concrete from the perimeter of the room, were collected to verify contaminated media were effectively removed.

Landfill 6

The landfill was remediated and capped according to the provisions of a Voluntary Cleanup Agreement between the previous property owner and the State. The landfill is monitored and maintained in accordance with a Site Management Plan, and includes periodic inspections and groundwater monitoring.

2013 Limited Site Investigation (PVE Focused Phase II)

As the PSI physical testing program concentrated only on the North Area areas of potential environmental concern, PVE directed focused testing activities in the South Area to gain preliminary information with respect to the hazardous building materials (lead-bearing paint and asbestos) identified in the 1996 ESA. PVE staff collected shallow soil samples from representative locations in the South Area to gain preliminary information as to the presence/absence of these materials (Attachment 10).

While results of analysis did not show the presence of asbestos, shallow soil samples contained elevated concentrations of lead. As the depositional regimen for this contaminant is sporadic, these preliminary tests provide sufficient evidence that the near-building areas of the South likely are affected by this hazardous substance. Surface soil samples also contained elevated concentrations of semi-volatile organic compounds.

Sampling Data

The tables below shows the known contaminants with the maximum concentrations detected/affected media. Maximum Contaminant Concentrations-Exceeding 6NYCRR Part 375 UUSCOs (mg/Kg) or 6NYCRR Part 700-705 Class GA Groundwater Standards

NORTH AREA

Contaminant	NYSDEC Standard		Soil (ppm)	Groundwater (ppb)	Effluent (OWS samples) (ppb)
	Soil UUSCO (ppm)	Class GA Groundwater (ppb)			
Inorganic Compounds					
Arsenic	13	25	51.1	-	-
Copper	50	200	99.8	-	-
Manganese	1,600	300	6,220	-	-
Nickel	30	100	97.2	-	-
Zinc	109	2,000	252	-	-
Lead	63	25	-	551	-
Organic Compounds					

Acetone	0.050	50	11	139	110,000
Methyl tert-butyl ether	0.93	10	-	-	49,000
Benzo(a)anthracene	1	0.002		4.78	-
Benzo(b)fluroanthene	1,000	0.002	-	4.99	-
Chrysene	1	0.002	2.5	6.49	-
2,4-Dimethylphenol	-	1	-	-	409
2-Methylphenol	330	1	-	-	741
3 & 4 Methylphenol	-	1	-	-	1,430
Phenol	0.330	1	-	-	1,480

3.0 SCOPE OF WORK

Field Activities

Field activities during the proposed IRM include site meetings, mobilization, implementing the health and safety plan, soil excavation and removal, end-point sampling and analytical testing for waste classification, and equipment decontamination. Subcontractors will be used for soil excavation, stockpiling, transportation/disposal, and analytical testing of end-point samples.

Site Meeting

A Site "kick-off" meeting will be held with PVE and the earth work subcontractor(s) prior to initiating field work activities. The purpose of the meeting will be to orient field team members and subcontractors with the Site, project personnel, Site background, scope of work, potential dangers, health and safety requirements, site-specific security and safety protocols, emergency contingencies and other field procedures. NYSDEC staff are welcome to attend and will be notified at least seven (7) days in advance of the meeting.

Mobilization

Following approval of the IRM Work Plan by NYSDEC, PVE and its subcontractors will mobilize necessary materials and equipment to the Site.

Health and Safety

It is anticipated that the work to be completed at the Site will be performed at level D personal protective equipment (PPE). Should health and safety monitoring during field activities warrant an upgrade to level C protection, work will temporarily stop, and level C PPE will be donned. The work area/breathing zone air monitoring program will be implemented by employing direct-reading survey instruments to identify the appropriate level of PPE needed based on total organic vapor and particulate concentrations. See the site specific HASP in Section 6 and Appendix B for additional information on Health and Safety.

Soil Characterization

Soil borings will be completed across the ROW for collection and analysis of soil samples in accordance with the RI Work Plan (2014) . A direct push/hollow stem auger drilling method will be implemented using a truck-mounted GeoProbe™ rig. A total of twenty (20) soil borings will be advanced to a depth of 15 feet bgs. Borings will be spaced approximately 75 feet apart (Figure 4). Soils from the borings will be visually inspected for contamination, and field-screened for VOCs using a photo-ionization detector (PID), and headspace techniques.

Samples will be collected from up to three (3) discrete horizons from each of the 20 borings: One (1) shallow surface sample (2-4 feet below grade); and up to two (2) subsurface soil samples, one of which will be collected at groundwater, refusal, or 15 feet below grade, whichever is encountered first.

Samples will be submitted to a NYSDOH ELAP-laboratory for analysis of 6 NYCRR Part 375 parameters, as described below:

- Target Compound List (TCL) VOCs by EPA Method 5035/8260;
- TCL SVOCs by EPA Method 8270;
- PCBs by EPA Method 8082;
- Pesticides by EPA Method 8081;
- TAL metals by EPA Method 6000/7000 series.

Please refer to the Sample Analysis Table (Table 2) for further sampling description.

Community Air Monitoring Plan (CAMP)

The CAMP will be implemented during the IRM to protect the health and safety of site workers and the surrounding community. This effort will include monitoring within and around the perimeter of the work area, in accordance with DER-10 Appendix 1A (attached as Appendix C). Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

Soil Excavation – 0-2 Feet Below Grade

The upper-most 0-2 feet of soil from the ROW will be excavated , segregated and stockpiled within the Soil Management Area (Figure 5). It is assumed that the top layer of the ROW is contaminated, therefore no characterization of this material is necessary until disposal.

Soil Excavation – Material Exceeding RRSCOs

Excavation and disposal of all soil that exceeds RRSCOs as defined by 6 NYCRR Part 375 within the ROW of the BCP. Presented below is a technical description of the proposed excavation work in accordance with the BCP and the DER-10 requirements.

Contaminated soil will be excavated from an area yet to be determined, with a volume yet to be determined, using standard earth-moving equipment as needed. Contaminated soil will be excavated to a maximum depth of approximately 15 feet below grade.

Upon completion of excavation activities, the area will be backfilled and compacted in accordance with the Town/County-approved plan for backfilling.

Environmental Analytical Testing Program

Confirmatory soil samples will be collected from the excavation ("end-point samples") to confirm the efficacy of the remedial measures. End-point samples will be analyzed for Site COCs and the results compared to the RRSCOs.

In addition, characterization samples will be collected from soil planned for off-site disposal. Waste characterization samples will be collected and analyzed in accordance with the requirements of the selected disposal facility. The QAPP (see Section 5 and Appendix A) was developed to define the methods and procedures for conducting the end-point and waste characterization sampling. The QAPP includes general field guidelines, sample equipment decontamination, soil sampling procedures, and field instrument descriptions and calibration procedures. All sampling will be conducted in accordance with the QAPP. The following subsections detail the end-point and waste characterization sampling plans for soil.

End-point Sampling

Post-excavation end-point soil samples will be collected in accordance with the frequency and procedures established in DER-10. Samples will be retained in laboratory-provided glassware and delivered to a NYSDOH ELAP-certified laboratory for analysis of metals via Target Analyte List (TAL) metals by EPA Method 6000/7000 series.

Waste Characterization

Contaminated soil will be stockpiled separately from soil that is presumed to meet SCOs. Samples will be collected from stockpiled materials and analyzed in accordance with the disposal facility's permit requirements and disposed of off -site in accordance with all applicable rules and regulations.

Data Review

All samples undergoing laboratory analysis will be subject to a third-party data review process in accordance with the QAPP, to ensure the usability of the data collected. Data usability summary reports documenting any issues with QA/QC will be prepared and included in the RI Report.

4.0 Chemical Hazard Assessment and Controls

4.1 Chemical Hazards

The predominant contaminants potentially encountered during the subsurface investigation in soil and groundwater include: volatile and semi-volatile organic compounds (VOCs and SVOCs); and inorganic metals including arsenic, barium, cadmium, chromium, copper, lead, magnesium, manganese, nickel, vanadium, and zinc. Chemical Hazard and MSDS Sheets are provided in Attachment D.

4.1.1 Table: Occupational Exposure Limits and Ionization Potentials of VOCs and SVOCs

VOCS								
Name	**Skin Absorption**	**PEL (1) (PPM)**	**REL(2) (PPM)**	**STEL (PPM)**	**IDLH (PPM)**	**TLV (3) (PPM)**	**IP (eV)**	**Carcinogen**
Methyl-tert butyl ether	Yes	NA	NA	NA	NA	50	NA	Suspected
1,2,4-Trimethylbenzene	Yes	NA	25	NA	NA	25	8.27	
1,3,5- Trimethylbenzene	Yes	25	NA	NA	NA	25	NA	
Benzene	Yes	1	0.1	1 (2)	500	0.5	9.24	X
Ethylbenzene	Yes	100	100	125 (2)	800	20	8.76	
Isopropylbenzene	Yes	NA	NA	NA	NA	50	NA	
n-butylbenzene	Yes	NA	NA	NA	NA	NA	NA	
n-propylbenzene	Yes	NA	NA	NA	NA	NA	NA	
p-isopropyltoluene	NA	NA	NA	NA	NA	NA	NA	
Sec-butylbenzene	Yes	NA	NA	NA	NA	NA	NA	
Tert-butylbenzene	Yes	NA	NA	NA	NA	NA	NA	
m & p-xylene	Yes	100	100	150 (2)	900	100	8.56	
Methylene chloride	Yes	25	NA	125 (1)	2300	50	11.32	X
Naphthalene	Yes	10	10	15 (2)	250	10	8.12	
o-xylene	Yes	100	100	150 (2)	900	100	8.56	
Toluene	Yes	200	100	150 (2)	500	20	8.82	
Acetone	Yes	1000	250	NA	2500	500	9.69	
Tetrachloroethylene	Yes	100	NA	NA	150	25	NA	X
SVOCs								
Name	**Skin Absorption**	**PEL (1) (PPM)**	**REL(2) (PPM)**	**STEL (PPM)**	**IDLH (PPM)**	**TLV (3) (PPM)**	**IP (eV)**	**Carcinogen**
Acenaphthylene (4)	NA	NA	NA	NA	NA	NA	NA	
Acenaphthene (4)	Yes	NA	NA	NA	NA	NA	NA	
Anthracene (4)	Yes	0.2(5) mg/m3	0.1(6)mg/m3	NA	80 mg/m3	NA	NA	
Benzo(a)anthracene (4)	No	NA	NA	NA	NA	L	NA	X
Benzo(a)pyrene (4)	Yes	0.2(5) mg/m3	0.1(6)mg/m3	NA	80 mg/m3	L	NA	X
Benzo(b)fluoranthene (4)	Yes	NA	NA	NA	NA	L	NA	X
Benzo(g,h,I) perylene (4)	Yes	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene (4)	Yes	NA	NA	NA	NA	NA	NA	X
Chrysene (4)	Yes	0.2(5) mg/m3	0.1(6)mg/m3	NA	80 mg/m3	L	NA	X
Coal Tar Pitch Volatiles	NA	0.2 (5) mg/m3	0.1 (6)mg/m3	NA	80 mg/m3	0.2(7) mg/m3	NA	X

Dibenzo(a,h)Anthracene (4)	Yes	NA	NA	NA	NA	NA	NA	X
Fluoranthene (4)	Yes	NA	NA	NA	NA	NA	NA	Suspected
Fluorene (4)	Yes	NA	NA	NA	NA	NA	NA	Suspected
Indeno(1,2,3-cd)pyrene (4)	Yes	NA	NA	NA	NA	NA	NA	X
Phenanthrene (4)	Yes	0.2[(5)] mg/m3	0.1[(6)]mg/m3	NA	80 mg/m3	NA	NA	X
Pyrene (4)	Yes	0.2[(5)] mg/m3	0.1[(6)]mg/m3	NA	80 mg/m3	NA	NA	X

1 -OSHA (Occupational Safety and Health Administration)
PEL - Permissible Exposure Limit (OSHA Standard)
STEL -Short Term Exposure Limit
2 - NIOSH (National Institutes for Occupational Safety and Health)
REL - Recommended Exposure Limit
IDLH – Immediately Dangerous to Life and Health
STEL -Short Term Exposure Limit
3 - ACGIH (formerly American Conference of Governmental Industrial Hygienists)
TLV - Threshold Limit Value
STEL -Short Term Exposure Limit
L – exposure by all routes should be as carefully controlled to levels as low as possible
4 - PELs are listed for these items under Coal Tar Pitch Volatiles
5 - Benzene Soluble fraction
6 – Cyclohexane-extractable fraction
7 - Benzene Soluble Aerosol
NA – not applicable
PPM – parts of airborne contaminant per million parts of air (by volume)
mg/m^3 – milligrams of airborne contaminant per cubic meter of air
IP – ionization potential
eV – electron volt

OSHA PELs, ACGIH TLVs, and NIOSH RELs are time-weighted averages (TWAs), which are defined as concentrations for a normal 8-hour work day(NIOSH RELS are based on 10 hours) and 40-hour work week to which almost all workers can be exposed repeatedly without suffering adverse health effects.

Per ACGIH, a STEL is defined as the concentration to which "workers can be exposed for short time periods without irritation, chronic or irreversible tissue damage, dose-rate-dependent toxic effects, or narcosis sufficient to be likely to increase the likelihood of accidental injury, impaired self-rescue or materially reduced work efficiency." The STEL is a 15-minute TWA. STELs are used by OSHA, ACGIH, and NIOSH.

IP refers to ionization potential which is the amount of energy required to remove an electron from an atom or molecule. Air sampling devices known as photo ionization detectors (PIDs) use ultraviolet (UV) light to ionize gas molecules in order to measure the presence of volatile organic compounds (VOCs). The most common light source used in PIDs is a 10.6 eV (electron volt) lamp.

4.1.2 Chemical Hazards of Metals of Concern

The metals detected in on-site soils and associated potential health effects are presented below. If dust control measures implemented during field activities cannot maintain dust levels at an acceptable level, the SSO will notify site workers of the condition. Personal Protective Equipment (PPE) summarized in Section 4.2.2 will be utilized.

Arsenic:

Exposure Routes: Inhalation, skin absorption, skin and/or eye contact.

Symptoms: Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, potential carcinogen.

Target Organs: Liver, kidneys, skin, lungs, *and lymphatic* system.

Cancer Site: Lung & lymphatic cancer.

OSHA PEL: 0.01 mg/m^3 as an 8-hour time-weighted average (TWA).

Barium:

Exposure Routes: Inhalation, skin and/or eye contact.

Symptoms: Irritation of eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse; extrasystoles; hypokalemia.

Target Organs: Eyes, skin, respiratory system, heart, and central nervous system.

OSHA PEL: 0.5 mg/m^3 as an 8-hour TWA.

Cadmium:

Exposure Routes: Inhalation, skin and/or eye contact.

Symptoms: Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea; vomiting; diarrhea; anosmia (loss of the sense of smell), emphysema; proteinuria; mild anemia; potential carcinogen.

Target Organs: Respiratory system, kidneys, prostate, and blood.

Cancer Site: Prostatic & lung cancer.

OSHA PEL: 0.005 mg/m^3 as an 8-hour TWA.

Chromium:

Exposure Routes: Inhalation, skin and/or eye contact.

Symptoms: Irritation eyes, skin; lung fibrosis.

Target Organs: Eyes, skin, and respiratory system.

OSHA PEL: 1 mg/m^3 as an 8-hour TWA.

Copper:

Exposure Routes: Inhalation skin and/or eye contact.

Symptoms: Contact can irritate and burn the eyes and skin. Inhalation can irritate the nose and throat causing coughing and wheezing.

Target Organs: Eye, skin and respiratory system.

OSHA PEL: 1 mg/m^3 as an 8-hour TWA

Lead:

Exposure Routes: Inhalation, ingestion, skin and/or eye contact.
Symptoms: Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension.
Target Organs: Eyes, gastrointestinal tract, central nervous system, kidneys, blood, and gingival tissue.

OSHA PEL: 0.050 mg/M^3 as an 8-hour TWA.

Magnesium:

Exposure Routes: Inhalation, skin and/or eye contact.
Symptoms: Inhaling this substance can irritate the nose, throat and lungs causing tightness in the chest and difficulty in breathing.
Target Organs: Nose, throat and lungs.

OSHA PEL: 15 mg/M^3 as an 8-hour TWA.

Manganese:

Exposure Routes: Inhalation.
Symptoms: The aerosol is irritating to the respiratory tract. The substance may have effects on the lungs and central nervous system, resulting in increased susceptibility to bronchitis, pneumonitis and neurologic, neuropsychiatric disorders
Target Organs: Respiratory tract and central nervous system.

OSHA PEL: 5 mg/M^3 as a Ceiling.

Nickel

Exposure Routes: inhalation, skin absorption, ingestion, skin and/or eye contact.
Symptoms: Irritation and burning of eyes and skin; skin allergy; irritation of nose, throat and lungs; headache, dizziness and vomiting; probable lung carcinogen; asthma-like allergy; chronic bronchitis and scarring of the lungs.

Target Organs: Eyes, skin, respiratory system, kidneys and liver.

OSHA PEL: 1.0mg/m^3 as an 8-hour TWA

Vanadium:

Exposure Routes: Inhalation, skin and/or eye contact.

Symptoms: The aerosol can irritate the nose, throat and lungs causing coughing, wheezing, and/or shortness of breath. Exposure can cause headache, tremors, and dizziness. Exposure may cause an asthma-like allergy. Exposure may damage the kidneys.

Target Organs: Respiratory tract, kidneys, eyes and skin and central nervous system.

OSHA PEL: 0.5 mg/M^3 as a Ceiling.

Zinc:

Exposure Routes: Inhalation, skin and/or eye contact.

Symptoms: The aerosol can irritate the nose and throat resulting in wheezing.

Target Organs: Eyes, skin, nose and throat.

OSHA PEL: 15 mg/M^3 as a Ceiling.

4.2 Chemical Exposure and Control

4.2.1 Activities with Chemical Exposure Potential

The primary route of exposure during site activities in areas contaminated with VOCs, SVOCs and inorganic metals is direct dermal contact, accidental or incidental ingestion, and inhalation of contaminant laden dust. The following work areas and site related activities are areas where chemical exposure is possible:

- Areas where drilling activities will be conducted.
- Contact with soil boring cores and samples.

4.2.2 Potential Chemical Exposures and Exposure Action Levels

4.2.2.1 Metals

Exposure potential exists during drilling borings and excavation of soils. Airborne dust can be an issue during soil excavation/drilling operations and skin contact can be anticipated during handling. Potential worker exposures exist, through accidental ingestion and direct skin contact, during the drilling task, as airborne dusts can be generated. Semi-volatile organic compounds typically adhere to the airborne soil particles while metals are liberated as well. Of the metals identified in the soil samples, Arsenic and Cadmium possess the lowest Threshold Limit Values (TLVs) at 0.01 mg/m^3 (10 ug/m^3). The highest level of Arsenic detected in the soil samples was 63 ug/kg. The highest level of Cadmium detected in the soil samples was 10 ug/kg. Assuming an uniform distribution and applying a safety factor, worker exposure can be controlled by establishing **an action level of 0.5 mg/m^3** total airborne dust, through engineering controls such as dust control. A direct reading dust monitor (e.g. TSI DustTrak) will be used as a surrogate to obtain real time data to aid in monitoring the effectiveness of dust controls. The dust monitor will be set to sample aerosols at PM_{10} (10 micron size particles) Exposures above the action level on 0.5 mg/m^3, will require the use of a NIOSH approved half-face respirator with an N or P, 100 filter.

Engineering controls such as wetting with an airless sprayer will be utilized as a control measure to suppress dust levels.

4.2.2.3 VOCs

The VOC detected in the soil borings with the lowest Threshold Limit Value level (TLV) is benzene, which has a 8 hour time weighted average (TWA) TLV of 0.5 ppm and a short term exposure limit (STEL) of 2.5 ppm. However, benzene was detected in only one of the twelve soil borings. The most frequently detected VOC with the lowest TLV was Naphthalene, which has measured in six of the twelve soil borings. The naphthalene TLV of 10 ppm will be used as the site's VOC action level. PPE will be upgraded to include NIOSH approved half-face respirators with organic vapor cartridges, if airborne concentrations of VOCs, as measured with a direct reading Photo Ionization Detector (PID) exceed 10 ppm or are above background level during on-site activities.

If PID readings in the areas above and surrounding the work area exceed 100 ppm, all on-site activities will be suspended. Future PPE selected will depend on the identity and concentrations of the contaminants encountered. PPE will be discussed in section 10.

First aid equipment will be available based on MSDS requirements.

To summarize, dust generated during field activities will be monitored continuously using a particulate air monitoring instrument. VOC levels during field activities will be continuously monitored using a PID. Exposure monitoring will be further discussed in section 9.

4.2.3 Exposure Control

A combination of PPE and engineering controls will be utilized to control skin contact and airborne exposures. Engineering controls will consist of demarcating areas to be bored and allow required personnel only in the work areas. Dust suppression will be used whenever possible to keep dust from becoming airborne. PPE will be discussed in section 7.

The following chemical exposure control measures will be implemented during the proposed site investigations:

- The SSO will perform air monitoring (see Section 6.1) in the worker's breathing zone to determine exposure to VOCs during field activities. If exposures exceed the action levels, respiratory protection, as discussed in Section 7.2, will be donned.
- To avoid direct dermal contact with potentially contaminated media, chemical protective clothing, as described in Section 7.1, will be required when collecting samples and decontaminating sampling equipment.
- Although highly unlikely, exposure to all of the contaminants of concern may occur via ingestion (hand-to-mouth transfer). The decontamination procedures described in Section 9.0 address personal hygiene issues that will limit the potential for contaminant ingestion.

5.0 Physical Hazards and Controls

5.1 Utility Hazards

5.1.1 Underground Utilities

New York law requires that, at least 48 hours prior to initiation of any subsurface work, a utility clearance be performed at the site. The driller will contact New York City One Center (1-800-272-4480) to request a mark-out of underground utilities in the proposed sampling areas. Work will not begin until the required utility clearances have been performed. Public utility clearance organizations typically do not mark-out underground utility lines that are located on private property. As such, the driller must exercise due diligence and try to identify the location of any private utilities on the properties being investigated. This requirement can be fulfilled in several ways, including:

- obtaining as-built drawings for the areas being investigated from the property owner;
- visually reviewing each proposed sampling/drilling location with the property owner or knowledgeable site representative;
- identifying a no-drilling/digging zone; or
- hand digging in the proposed drilling/excavation locations if insufficient data is available to accurately determine the location of the utility lines.

Natural gas and municipal water transmission and service lines are likely to be in Bay Street, Columbia Street and/or Sigourney Street. The exact location of these utilities is not known at this time. A mark-out of utilities leading to the subject property will be requested from the Underground Facilities Protection Organization.

5.1.2 Overhead Utilities

Be particularly aware of overhead power lines in the work area. Any vehicle or mechanical equipment capable of having parts of its structure elevated (drill rig, crane, etc.) near energized overhead lines shall be operated so that a clearance of at least ten (10) feet is maintained. If the voltage is higher than 50kV, the clearance shall be increased four (4) inches for every 10kV over that voltage. Overhead utility lines are located along the south side of Main Street and cross a portion of the parking lot on to the north of the building on the site.

5.2 Traffic Concerns

Work is being performed at exterior locations where traffic may be a concern (i.e. Columbia Street and intersecting cross streets). The following precautions should be followed. All are designed to draw attention to the work and to warn other people of the activities.

- Notify the property owner of your work location, dates of work and the anticipated work times. Suggest the possibility of a detour around the work area.
- Wear an orange safety vest. If work is being performed at dawn, dusk or evening, the vests must have reflective tape.
- Set up traffic cones 50 feet in front of the work area. “Work Zone” signs should also be placed in a conspicuous area to warn others of your presence.

5.3 Drilling Hazards

Use of a conventional drilling rig to complete soil borings will require all personnel in the vicinity of the operating rig to wear steel-toed boots, hardhats, hearing protection and safety eyewear. Personnel shall not remain in the vicinity of operating equipment unless it is required for their work responsibilities. Additionally, the following safety requirements must be adhered to:

- All drill probes and other machinery with exposed moving parts must be equipped with an operational emergency stop device. Drillers and geologists must be aware of the location of this device. This device must be tested prior to job initiation and periodically thereafter. The driller and helper shall not simultaneously handle augers unless there is a standby person to activate the emergency stop.
- The driller must never leave the controls while the tools are operating unless all personnel are kept clear of operating equipment.
- Drillers, helpers and geologists must secure all loose clothing when in the vicinity of drilling operations.
- Only equipment that has been approved by the manufacturer may be used in conjunction with site equipment and specifically to attach sections of drilling tools together.

5.4 Noise Exposure

The use of the drilling rig will generate noise levels that will require the use of hearing protection in the immediate vicinity. Appropriate earmuffs or earplugs (i.e., with an NRR greater than 25 dB) should be worn to prevent overexposure. The general rule of thumb is that if you have to raise your voice to be understood by someone who is standing 3 to 5 feet away from you, the noise levels are likely to be above 85 dB and therefore require the use of hearing protection.

5.5 Back Safety

Using the proper techniques to lift and move heavy pieces of equipment, such as drums of investigation-derived wastes, are important to reduce the potential for back injury. The following precautions should be implemented when lifting or moving heavy objects.

- Use mechanical devices to move objects, such as drums of investigation derived wastes, that are too heavy to be moved manually.
- If mechanical devices are not available, ask another person to assist you.
- Bend at the knees, not the waist. Let your legs do the lifting.
- Do not twist while lifting.
- Bring the load as close to you as possible before lifting.
- Be sure the path you are taking while carrying a heavy object is free of obstructions and slip, trip and fall hazards.

5.6 Electrical Safety

If using portable tools that are electrically powered, follow the safety precautions listed below:

- Check to see that electrical outlets used to supply power during field operations is of the three (3) wire grounding type.
- Extension cords used for field operations should be of the three (3) wire grounding type and designed for hard or extra-hard usage. This type of cord uses insulated wires within an inner insulated sleeve and will be marked S, ST, STO, SJ, SJO or SJTO.
- NEVER remove the ground plug blade to accommodate ungrounded outlets.
- Do not use extension cords as a substitute for fixed or permanent wiring. Do not run extension cords through openings in walls, ceilings or floors.
- Protect the cord from becoming damaged if the cord is run through doorways, windows or across pinch points.
- Examine extension and equipment cords and plugs prior to each use. Damaged cords with frayed insulation or exposed wiring and damaged plugs with missing ground blades must be removed from service immediately.
- All portable or temporary wiring which is used outdoors or in other potentially wet or damp locations must be connected to a circuit that is protected by a ground fault circuit interrupter (GFCI). GFCI's are available as permanently installed outlets, as plug-in adapters and as extension cord outlet boxes. Do not continue to use a piece of equipment or extension cord that causes a GFCI to trip.
- When working in flammable atmospheres, be sure that the electrical equipment being used is approved for use in Class I, Division I atmospheres.
- Do not touch a victim who is still in contact with current. Separate the victim from the source using a dry, non-metallic item such as a broom stick or cardboard box. Be sure your hands are dry and you are standing on a dry surface. Turn off the main electrical power switch and then begin rescue efforts.

5.7 Thermal Stress

The hazards of both heat and cold stress are addressed in this HASP.

5.7.1 Heat Stress

Types of Heat Stress

Heat related problems include heat rash, fainting, heat cramps, heat exhaustion and heat stroke. Heat rash can occur when sweat isn't allowed to evaporate, leaving the skin wet most of the time and making it subject to irritation. Fainting may occur when blood pools to lower parts of the body and as a result, does not return to the heart to be pumped to the brain. Heat related fainting often occurs during activities that require standing erect and immobile in the heat for long periods of time. Heat cramps are painful spasms of the muscles due to excessive salt loss associated with profuse sweating. Heat exhaustion results from the loss of large amounts of fluid and excessive loss of salt from profuse sweating. The skin will be clammy and moist and the affected individual may exhibit giddiness, nausea and headache.

Heat stroke occurs when the body's temperature regulatory system has failed. The skin is hot, dry, red and spotted. The affected person may be mentally confused and delirious. Convulsions could occur. Early recognition and treatment of heat stroke are the only means of preventing brain damage or death. A

person exhibiting signs of heat stroke should be removed from the work area to a shaded area. The person should be soaked with water to promote evaporation. Fan the person's body to increase cooling. Immediate medical assistance is needed in case of heat stroke. Dial 911 to request an ambulance.

Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks.

Early Symptoms of Heat-Related Health Problems:

- decline in task performance
- incoordination
- decline in alertness
- unsteady walk
- excessive fatigue
- reduced vigilance
- muscle cramps
- dizziness

Susceptibility to Heat Stress Increases due to:

- lack of physical fitness
- lack of acclimation
- increased age
- dehydration
- obesity
- drug or alcohol use
- sunburn
- infection

People unaccustomed to heat are particularly susceptible to heat fatigue. First timers in PPE need to gradually adjust to the heat.

The Effect of Personal Protective Equipment

Sweating normally cools the body as moisture is removed from the skin by evaporation. However, the wearing of certain personal protective equipment (PPE), particularly chemical protective coveralls (e.g., Tyvek), reduces the body's ability to evaporate sweat and thereby regulate heat buildup. The body's efforts to maintain an acceptable temperature can therefore become significantly impaired by the wearing of PPE.

Measures to Avoid Heat Stress:

The following guidelines should be adhered to when working in hot environments:

- Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
- Identify a shaded, cool rest area.
- Rotate personnel, alternate job functions.
- Water intake should be equal to the sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst. Do not depend on thirst to signal when and how much to drink. For an 8-hour work day, 50 ounces of fluids should be consumed.
- Eat lightly salted foods or drink salted drinks such as Gatorade to replace lost salt.
- Save most strenuous tasks for non-peak heat hours such as the early morning or at night.
- Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.
- Avoid double shifts and/or overtime.

The implementation and enforcement of the above-mentioned measures will be the joint responsibility of the PM and SSO. Potable water and fruit juices should be made available each day for the field team.

Heat Stress Monitoring Techniques

Site personnel should regularly monitor their heart rate as an indicator of heat strain by the following method:

Check radial pulse rates by using fore- and middle fingers and applying light pressure to the pulse in the wrist for one (1) minute at the beginning of each rest cycle. If the pulse rate exceeds 110 beats/minute, shorten the next work cycle by one-third and keep the rest period the same. If, after the next rest period, the pulse rate still exceeds 110 beats/minute, shorten the work cycle again by one-third.

5.7.2 Cold Stress

Types of Cold Stress

Cold injury is classified as either localized, as in frostbite, frostnip or chilblain; or generalized, as in hypothermia. The main factors contributing to cold injury are exposure to humidity and high winds, contact with wetness and inadequate clothing.

The likelihood of developing frostbite occurs when the face or extremities are exposed to a cold wind in addition to cold temperatures. The freezing point of the skin is about 30°F. The fluids around the cells of the body tissue freeze, causing the skin to turn white. This freezing is due to exposure to extremely low temperatures. As wind velocity increases, heat loss is greater and frostbite will occur more rapidly.

Symptoms of Cold Stress

The first symptom of frostbite is usually an uncomfortable sensation of coldness, followed by numbness. There may be a tingling, stinging or aching feeling in the effected area. The most vulnerable parts of the body are the nose, cheeks, ears, fingers and toes.

Symptoms of hypothermia, a condition of abnormally low body temperature, include uncontrollable shivering and sensations of cold. The heartbeat slows and may become irregular, the pulse weakens and the blood pressure changes. Pain in the extremities and severe shivering can be the first warning of dangerous exposure to cold.

Maximum severe shivering develops when the body temperature has fallen to 95°F. This must be taken as a sign of danger and exposure to cold must be immediately terminated. Productive physical and mental work is limited when severe shivering occurs.

Methods to Prevent Cold Stress

When the ambient temperature, or a wind chill equivalent, falls to below 40°F, site personnel who must remain outdoors should wear insulated coveralls, insulated boot liners, hard hat helmet liners and insulated hand protection. Wool mittens are more efficient insulators than gloves. Keeping the head covered is very important, since 40% of body heat can be lost when the head is exposed. If it is not

necessary to wear a hard hat, a wool knit cap provides the best head protection. A face mask may also be worn.

Persons should dress in several layers rather than one single heavy outer garment. The outer piece of clothing should ideally be wind and water proof. Clothing made of thin cotton fabric or synthetic fabrics such as polypropylene is ideal since it helps to evaporate sweat. Polypropylene is best at wicking away moisture while still retaining its insulating properties. Loosely fitting clothing also aids in sweat evaporation. Denim is not a good protective fabric. It is loosely woven which allows moisture to penetrate. Socks with a high wool content are best. If two pairs of socks are worn, the inner sock should be smaller and made of cotton, polypropylene or a similar type of synthetic material that wicks away moisture. If clothing becomes wet, it should be taken off immediately and a dry set of clothing put on.

If wind conditions become severe, it may become necessary to shield the work area temporarily. The SSO and the PM will determine if this type of action is necessary. Heated break trailers or a designated area that is heated should be available if work is performed continuously in the cold at temperatures, or equivalent wind chill temperatures of 20^{o}F.

Dehydration occurs in the cold environment and may increase the susceptibility of the worker to cold injury due to significant change in blood flow to the extremities. Drink plenty of fluids, but limit the intake of caffeine.

6.0 Air Monitoring

6.1 Monitoring Parameters and Action Levels

Based on the existing Site data, it is not expected that significant levels of organic vapors will be encountered during the Site work. However, air monitoring will be conducted for VOCs. Air monitoring of the breathing zone will be conducted periodically or continuously during field activities to assure proper health and safety protection for the team, workers, and passersby.

VOCs will be monitored with a PID in accordance with the HASP with an action level of 10 ppm in the absence of benzene. If the action level is exceeded and adequate ventilation cannot be provided, work will cease and the potential affected portion of the work area will be evacuated, until adequate mechanical ventilation can be setup to reduce the VOC exposure. Level C respiratory protection may be donned in accordance with the HASP, if the action level is exceeded.

Fugitive dust generation that could affect Site workers, Site occupants, or the public is not expected because the majority of work will be conducted in moist soil. Soil that is not moist will be wetted as appropriate to minimize visible dust emissions. Particulate monitoring will be conducted at the perimeter of the Site. If dust levels exceed the action level of 0.5 mg/m^3 or background levels (whichever is highest), based on PM-10 size for a duration exceeding 15 or more minutes, work activities will be suspended until dust levels are diminished to an acceptable level.

All monitoring instruments must be calibrated and maintained periodically. Calibration and on-site maintenance records will be kept in the field log book. The operator must understand the limitations and possible sources of errors for each instrument. It is important that the operator checks that the instrument responds properly to the substances it was designed to monitor. Portable air quality monitoring equipment that measures total volatile organic compounds present such as the Rae Systems MiniRae 2000 (or equivalent) photo ionization detector (PID) must be calibrated at least once per week. Dust monitors must be calibrated at least once a week. The specific instructions for calibration and maintenance provided for each instrument should be followed.

Site air monitoring data will be reviewed weekly by a Certified Industrial Hygienist (CIH). Electronic copies of all air monitoring data will be maintained by the CIH.

Air monitoring results will be recorded in the field book during site activities and made available for NYCDEP and New York State Department of Health (NYSDOH) review.

The following table summarizes **air monitoring action levels** established for the site:

Contaminants	Action level	Actions
Organic Vapor		Measure and record the upwind background concentration.
	Reading **less than 10 ppm** above background for a sustained period of 15 minutes in WBZ.	Continue work in Level D protection.
	Reading **greater than**	Discontinue work, allow work area to ventilate, collect

	10 ppm above background for a sustained period of 15 minutes in the WBZ	additional PID readings. If concentrations remain greater than 10 ppm, work can resume in Level C protection with respiratory protection equipped with organic vapor cartridges.
	Readings **greater than 100 ppm** above background for a sustained period of 15 minutes in the WBZ.	Discontinue work, allow work area to ventilate, collect additional PID readings until concentrations are below 100 ppm before work can resume.
Dusts		Measure and record the upwind background concentration.
	Reading **less than 0.5 mg/m3**, based on PM-10, above background for a sustained period of 15 minutes in the WBZ.	Continue work in level D protection.
	Reading **greater than 0.5 mg/m3, based on PM-10,** above background for a sustained period of 15 minutes in the WBZ	Discontinue work. Employ dust suppression using a water spray, collect additional airborne dust measurements. If concentrations remain greater than 0.5 mg/m^3, work can resume in Level C protection with respiratory protection equipped with P-100 cartridges.

6.2 Direct Reading Instruments

A PID such as the RAE MiniRAE 2000, equipped with a 10eV lamp, shall be used to monitor total VOCs during soil sampling and drilling activities. The PID is an appropriate direct-read monitoring instrument given the suspected presence of VOC contamination in on-site soil.

Dust levels will be monitored using a particulate air monitoring instrument (PM10).

6.3 Personal Air Sampling

OSHA does not require the collection of personal air sampling during the proposed activities. As such, this type of monitoring will not be conducted by personnel during any of the proposed tasks.

6.4 Record Keeping

Air monitoring results will be recorded in the field book during construction activities and made available for NYCDEC and New York State Department of Health (NYSDOH) review.

7.0 Personal Protective Equipment

Personal protective equipment (PPE) will be worn during site activities to prevent on-site personnel from being injured by the safety hazards posed by the site and/or the activities being performed. In addition, chemical protective clothing will be worn to prevent direct dermal contact with the site's chemical contaminants.

In general, field activities will be conducted in Level D PPE, as described in the table below. PPE will be upgraded to Level C if air monitoring demonstrates VOCs or dust concentrations in the breathing zone exceeding the action levels outlined in Section 4.2.2.

If the concentration of volatile organics which can be detected with a PID equals or exceeds the specified action level (100 ppm) all field personnel associated with the project will immediately retreat to a location up-wind of the source of contamination. At this point the SSO must consult with the HSM, who will review the condition with PVE home office staff to discuss appropriate actions.

7.1 Chemical Protective Clothing

The following tables describe the Level D and Level C PPE and chemical protective clothing to be worn for general site activities and for certain specific tasks.

Level D PPE

PPE Item	Mobilization	Characterization	Excavation and Disposal
Hard Hat	✓	✓	✓
Steel Toed Safety Shoes	✓	✓	✓
Safety Glasses with Side shields		✓	✓
Traffic Vests	*	*	*
Inner PVC/Outer Nitrile Gloves		✓	✓
Hearing Protection		✓	

Level C PPE

PPE Item	Mobilization	Characterization	Excavation and Disposal
Hard Hat	✓	✓	✓
Steel Toed Safety Shoes	✓	✓	✓
Safety Glasses with Side shields	✓	✓	✓
Traffic Vests	*	*	*
Inner PVC/Outer Nitrile Gloves	✓	✓	✓
Hearing Protection		✓	
Half-Face Respirator	✓	✓	✓
Tyvek Protective Suit	✓	✓	✓

7.2 Respiratory Protection

Level D PPE: No respiratory protection required. Air monitoring devices will be used to determine when PPE will be upgraded to include respiratory protection (Section 4.2.2 and 6.0).

Level C PPE: Half-mask, air-purifying respirator equipped with organic vapor/PM100 cartridges.

Respiratory protection will also be worn if odors become objectionable at any time, if respiratory tract irritation is noticed, or if VOCs are detected in the breathing zone as discussed in Section 4.2.2. All on-site personnel who are expected to wear respiratory protection must have successfully passed a qualitative or quantitative fit-test within the past year for the brand, model and size respirator they plan to wear during the proposed activities.

7.3 Other Safety Equipment

The field team will bring the following additional safety items to the site for use as necessary:

- Portable, hand-held eyewash bottles
- First aid kit
- Portable communications equipment
- Fire Extinguisher

8.0 Site Control

8.1 Work Zones

To prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, work areas along with personal protective equipment requirements will be clearly identified. Work areas or zones will be designated as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, November, 1985. They recommend the areas surrounding each of the work areas to be divided into three zones:

- Exclusion or "hot" Zone
- Contamination Reduction Zone (CRZ)
- Support Zone

8.1.1 Exclusion Zone

An exclusion zone (work zone) will be established around each boring location. This zone will move as work progresses to each boring location. This zone should be large enough (i.e. 20 foot radius) to protect unprotected personnel from contact with vapors or dusts that may arise from these operations as well as the physical hazards associated with the operation of heavy equipment. Traffic cones or tape will be used to demarcate the active exclusion zone.

All personnel entering the exclusion zone must be trained in accordance with the requirements defined in Section 10.2 of this HASP and must wear the prescribed level of personal protective equipment.

8.1.2 Contamination Reduction Zone

The decontamination zone will be established adjacent to the exclusion zone. Personnel will remove contaminated gloves and other disposable items in this area and place them in a plastic bag until they can be properly disposed of. Reusable equipment, if any, will be decontaminated with tap water, deionized water, methanol, nitric acid and a liquid detergent solution. A complete description of decontamination procedures is presented in Appendix A to the Interim Remedial Measures Work Plan.

8.1.3 Support Zone

At this site, the support zone will include the area outside of the decontamination zone.

8.2 Safety Practices

The following measures are designed to augment the specific health and safety guidelines provided in this plan.

- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the immediate work area and the decontamination zone.
- Smoking is prohibited in all work areas. Matches and lighters are not allowed in these areas.
- Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking or any other activities.
- Beards or other facial hair that interfere with respirator fit are prohibited.

- The use of alcohol or illicit drugs is prohibited during the conduct of field operations.
- All equipment must be decontaminated or properly discarded before leaving the site in accordance with the project work plan.

9.0 Decontamination

9.1 Personal Decontamination

Proper decontamination is required of all personnel before leaving the site. Decontamination will occur within the contamination reduction zone. Disposable PPE will be removed in the decontamination zone and placed in lined garbage bags.

If worn, respirators will be cleaned after each use with respirator wipe pads and will be stored in plastic bags after cleaning.

Regardless of the type of decontamination system required, a container of potable water and liquid soap will be made available so employees can wash their hands before leaving the site for lunch or for the day.

9.2 Equipment Decontamination

Reusable equipment, if any, will be decontaminated with tap water, deionized water, methanol, nitric acid and a liquid detergent solution. A complete description of decontamination procedures is presented in Appendix A to the IRM Work Plan.

10.0 Medical Monitoring and Training Requirements

10.1 Medical Monitoring

Medical monitoring (29 CFR 1910.1020(f)) is not a requirement of this HASP.

10.2 Health and Safety Training

Although not a requirement for the activities at this site, personnel performing activities covered by this HASP are recommended to have completed the appropriate training requirements specified in 29 CFR 1910.120(e). Each individual should have completed an annual 8-hour refresher-training course and/or initial 40-hour training course within the last year prior to performing any work on the sites covered by this HASP.

10.3 Pre-Entry Briefing

The SSO will conduct a pre-entry briefing before site activities begin. HASP receipt and acceptance sheets will be collected at this meeting. Short safety refresher meetings will be conducted, as needed, throughout the duration of the project. Attendance of the pre-entry meeting is mandatory and will be documented by the SSO. An attendance form is presented in Attachment B.

11.0 Emergency Response

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result in an uncontrolled release of a hazardous substance." On-site personnel shall not participate in any emergency response where there are potential safety or health hazards (i.e., fire, explosion, or chemical exposure). Response actions will be limited to evacuation and medical/first aid as described within this section below. As such this section is written to comply with the requirements of 29 CFR 1910.38 (a).

The basic elements of an emergency evacuation plan include:

- employee training,
- alarm systems,
- escape routes,
- escape procedures,
- critical operations or equipment,
- rescue and medical duty assignments,
- designation of responsible parties,
- emergency reporting procedures and
- methods to account for all employees after evacuation.

11.1 Employee Training

Employees must be instructed in the site-specific aspects of emergency evacuation. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed. The SSO must verify the specific evacuation procedures that the facility prefers contractors follow in the event of a facility-related emergency. This information will be communicated to the field team during the pre-entry briefing.

11.2 Alarm Systems/Emergency Signals

An emergency communication system must be in effect at all sites. The most simple and effective emergency communication system in many situations will be direct verbal communication. Each site must be assessed at the time of initial site activity and periodically as the work progresses. Verbal communication must be supplemented anytime voices can not be clearly perceived above ambient noise levels (i.e., noise from drilling probe) and anytime a clear line-of-sight can not be easily maintained among all personnel because of distance, terrain or other obstructions.

Verbal communication will be adequate to warn on-site personnel of hazards associated with the immediate work area. However, the two person sampling team may be split up during the day to expedite sampling. Each team member will be equipped with a cellular phone to ensure immediate communication can occur between each other. These phones can also be used to contact local emergency responders.

11.3 Escape Routes and Procedures

The SSO will verify the escape routes from each work area with a facility representative. Assembly areas must also be identified. The escape routes and assembly areas will be reviewed during the pre-entry briefing. All personnel on site are responsible for knowing the escape route from the site and where to assemble after evacuation.

11.4 Rescue and Medical Duty Assignments

The phone numbers of the police and fire departments, ambulance service, local hospital, and project representatives are provided in the emergency reference sheet and on the cover of this HASP. This sheet will be posted in the site vehicle.

In the event an injury or illness requires more than first aid treatment, the SSO will accompany the injured person to the medical facility and will remain with the person until release or admittance is determined. The SSO will relay all appropriate medical information to the on-site project manager and the HSM.

If the injured employee can be moved from the accident area, he or she will be brought to the contamination reduction zone where their PPE will be removed. If the person is suffering from a back or neck injury the person will not be moved and the requirements for decontamination do not apply. The SSO must familiarize the responding emergency personnel about the nature of the site and the injury. If the responder feels that the PPE can be cut away from the injured person's body, this will be done on-site. If this not feasible, decontamination will be performed after the injured person has been stabilized.

11.5 Designation of Responsible Parties

The SSO is responsible for initiating emergency response. In the event the SSO can not fulfill this duty, the PM or HSO will take charge.

11.6 Employee Accounting Method

The SSO is responsible for identifying all personnel on-site at all times. On small, short duration jobs this can be done informally as long as accurate accounting is possible.

11.7 Accident Reporting and Investigation

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage requires an accident investigation and report. The investigation should be conducted as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided. An accident investigation form is presented in Attachment C of this HASP. The Supervisor of the injured personnel and the HSM should be notified immediately of the injury.

If a subcontractor personnel is injured, they are required to notify the SSO. Once the incident is under control, the subcontractor will submit a copy of their company's accident investigation report to the SSO.

Emergency references

Project Representatives:

Conor Tarbell (Project Manager)
Office: (845) 454-2544
Cell: (607) 226-2764
48 Springside Avenue
Poughkeepsie, New York 12601

Drilling Contractor:

Not yet defined

ATTACHMENT A

Health and Safety Plan Receipt and Acceptance Form

Health and Safety Plan Receipt and Acceptance Form

Interim Remedial Measures Work Plan
3532 North Road
Poughkeepsie, New York 12603
NYCDEC# C314121

I have received a copy of the Health and Safety Plan prepared for the above-referenced site and activities. I have read and understood its contents and I agree that I will abide by its requirements.

Name/Signature	Organization	Date

ATTACHMENT B

Health and Safety Plan Pre-Entry Briefing Attendance Form

Health and Safety Plan Pre-Entry Briefing Attendance Form

Interim Remedial Measures Work Plan
3532 North Road
Poughkeepsie, New York 12603
NYCDEC# C314121

Briefing Conducted By: _____

Date Performed: _____

Printed Name	Signature	Representing

ATTACHMENT C

Supervisor's Accident Investigation Report Form

SUPERVISOR'S ACCIDENT INVESTIGATION REPORT

Injured Employee _____ Job Title _____

Home Office _____ Division/Department _____

Date/Time of Accident _____

Location of Accident _____

Witnesses to the Accident _____

Injury Incurred? _____ Nature of Injury _____

_____

Engaged in What Task When Injured? _____

_____

Will Lost Time Occur? ____ How Long? _____ Date Lost Time Began _____

Were Other Persons Involved/Injured? _____

_____

How Did the Accident Occur? _____

_____

_____

_____

_____

What Could Be Done to Prevent Recurrence of the Accident? _____

_____

_____

What Actions Have You Taken Thus Far to Prevent Recurrence? _____

_____

_____

Supervisor's Signature _____ Title _____ Date _____

Reviewer's Signature _____ Title _____ Date _____

Note: If the space provided on this form is insufficient, provide additional information on a separate page and attach. The completed accident investigation report must be submitted to the Health and Safety Manager within two days of the occurrence of the accident.

ATTACHMENT D

Chemical Hazard and MSDS Sheets

RCRA Metals

Volatile Organic Compounds

Semi-Volatile Organic Compounds

FIGURES

Figure 3
Route to Nearest Hospital

Directions to Hospital

APPENDIX C – CAMP

DER-10

APPENDIX 1A

New York State Department of Health Generic Community Air Monitoring Plan

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 volatile organic compounds (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 NYSDEC/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. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- ☐ If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 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.

- ☐ 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.

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

All 15-minute readings must be recorded and be available for State (DEC and DOH) 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.

- ☐ If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) 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/m3 above the upwind level and provided that no visible dust is migrating from the work area.

- ☐ If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 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/m3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

APPENDIX D – PHOTOGRAPHS OF CURRENT SITE CONDITIONS

APPENDIX E - CPP

Appendix C

Citizen Participation Plan

Citizen Participation Plan

EFG/DRA Heritage, LLC (hereafter referred to as "EFG/DRA") has established this Citizen Participation Plan (CPP) for the "Hudson River Psychiatric Center - North Area" Brownfield Cleanup Program (BCP) site, hereafter referred to as the "Site". This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process.

As part of its obligations under the NYSDEC BCP, EFG/DRA will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYSDEC Division of Environmental Remediation (DER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to DER's project manager assigned to this Site who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at 518-402-9764.

Site Contact List

EFG/DRA has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Site Contact List includes the chief executive officer and zoning board chairpersons of each county, city, town, and village in which the Site is located; residents, owners, and occupants of the Site and properties adjacent to the Site; local news media from which the community typically obtains information; the public water supplier which services the area in which the site is located; the administrator of any school or day care facility located on or near the Site; and any person who has requested to be placed on the site contact list. The current Site Contact List is included below.

Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by DER's project manager. If you would like to be added to the Project Contact List, contact DER at 518-402-9764.

Repositories

A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation work plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. EFG/DRA will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Adriance Memorial Library
93 Market Street
Poughkeepsie, New York 12601
(845) 485-3445
Attn: Lauren Muffs, Assistant Director

Mon – Thu: 9 am – 9 pm
Fri – Sat: 9 am – 5 pm
Sun: 2 pm – 5 pm (closed Sundays in August)

Public Notice and Public Comment

Public notice to all members of the Project Contact List is required at several steps during the performance of the cleanup program (listed below) and at other points that may be required by NYSDEC. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by EFG/DRA, reviewed and approved by NYSDEC prior to distribution. Public comment is solicited in public notices for all work plans developed under the NYSDEC BCP. Final review of all work plans by NYSDEC will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones

Public notice and public comment activities occur at several steps during a typical NYSDEC BCP project. See flow chart below, which identifies when during the NYSDEC BCP public notices are issued.

Project Phase/Document	Document in Repository	Notice	Fact Sheet	Comment Period	Other
BCP Application	Yes	Yes	Not Required	30 days	Publish a notice of Applicant's request to participate in the BCP in a local newspaper, the NYSDEC Environmental Notice Bulletin (ENB), and to those on the public contact list
Before approval of Remedial Investigation (RI) Work Plan	Yes	Yes	Yes	30 days	RI Work Plan can be submitted with BCP Application
Before approval of RI Report	Yes	Yes	Yes	Not required	Fact Sheet describes findings of RI
Before approval of Remedial Work Plan	Yes	Yes	Yes	45 days	Fact Sheet must describe plan or, if applicable, basis for No Action. Public meeting may be requested.
Prior to construction	Not Required	Yes	Yes	Not Required	Notice to contact list announcing the start of construction
Before approval of Final Engineering Report	Yes	Yes	Yes	Not Required	The report describes any institutional or engineering controls included in the remedy
Issuance of Certificate of Completion if institutional/engineering controls are part of remedy	Yes	Yes	Yes	Not Required	Notice and fact sheet to contact list describing such controls within 10 days of issuance of certificate

Site Contact List Information

Local Elected Officials

The proposed BCP Site is located in the Town of Poughkeepsie, Dutchess County, New York.

Dutchess County

County Executive	**Commissioner of Planning**
Marcus Molinaro Dutchess County Executive 22 Market Street Poughkeepsie, NY 12601	Kealy Solomon Commissioner Dutchess County Dept. of Planning & Development 27 High Street Poughkeepsie, NY 12601

Town of Poughkeepsie

Town Supervisor	Councilperson
Todd Tancredi Supervisor Town of Poughkeepsie 1 Overrocker Road Poughkeepsie, NY 12603	Michael Cifone Councilperson – 4th Ward 94 Fairview Avenue Poughkeepsie, NY 12601
Planning Board Chair	
John Weisman Chairman Town of Poughkeepsie Planning Board 1 Overrocker Road Poughkeepsie, New York 12603	

Residents, Owners, and Occupants of the Property and adjacent properties

Subject Property:

Property Owner	**Tax ID**	**Site Address (If Different)**
EFG/DRA Heritage, LLC 7200 South Alton Way; Suite B-310 Centennial, CO 80112	6163-03-011149	3532 North Road Poughkeepsie, New York 12601

Owners of properties adjacent to the proposed site:

Property Owner	**Tax ID**	**Site Address (If Different)**
Elisabeth B. Potts 9 Windsor Ct Poughkeepsie, NY 12601	6163-03-085269	
American Legion Post 50 Legion Rd Poughkeepsie, NY 12601	6163-03-150278	

Alicia Cowan 14 Windsor Ct Poughkeepsie, NY 12601	6163-03-110268	
Windsor Court Homeowners Assn 4 Windsor Ct Poughkeepsie, NY 12601	6163-03-076304	
Brian D. Acard 8 Windsor Ct Poughkeepsie, NY 12601	6163-03-077269	
New York State 515 Broadway Albany, NY 12207	6163-03-301169	24 W Cottage Rd Poughkeepsie, NY 12601
Archdiocese of New York 1011 First Ave New York, NY 10022	6163-03-219158	185 Hudson View Dr Poughkeepsie, NY 12601
Betsy S. Seaman 12 Windsor Ct Poughkeepsie, NY 12601	6163-03-097269	
Michael C. Gumbinger 13 Windsor Ct Poughkeepsie, NY 12601	6163-03-104267	
College Carriage House LLC 72 Bowmen's Glen Ln Clinton Corners, NY 12514	6163-03-201269	14 Cherry Lane Poughkeepsie, NY 12601
Daniel T. Kozuch 11 Windsor Ct Poughkeepsie, NY 12601	6163-03-093269	
Constance M. Walker 10 Windsor Ct Poughkeepsie, NY 12601	6163-03-090269	
Virginia A. Buechele 16 Windsor Ct Poughkeepsie, NY 12601	6163-03-109278	Virginia A. Buechele PO Box 243 Pleasant Valley NY 12569

Local news media from which the community typically obtains information.

Poughkeepsie Journal
85 Civic Center Plaza Poughkeepsie, New York 12601

The public water supplier which services the area in which the property is located.

Water Department
Keith Ballard Managing Operator Town of Poughkeepsie Water Department 198 Cedar Avenue Poughkeepsie, New York 12603

Any person who has been asked to be placed on the contact list, and interested parties.

Dennis Murray Marist College Office of the President 3399 North Road Poughkeepsie, NY 12601	Susan DeKrey Vice President for Communications Vassar College 124 Raymond Avenue Poughkeepsie, NY 12604
Steven Hengst Director of Communications Culinary Institute of America 1964 Campus Drive Hyde Park, NY 12538	Judi Stokes Office of Community Relations and Graphics Dutchess Community College 53 Pendell Road Poughkeepsie, NY 12601
Thomas Mauro Chief of Police Town of Poughkeepsie Police Department 19 Tucker Drive Poughkeepsie, NY 12603	

The administrator of any school or day care facility located on or near the property.

Two daycare facilities are located within one-half mile of the proposed site:

Wee Play Children's Center 13 Hook Road Poughkeepsie, NY 12601	The Children's Home of Poughkeepsie 10 Children's Way Poughkeepsie, NY 12601