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April 14, 2020

Mr. Michael Kilmer
Project Manager
New York State Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, NY 12561 153292

Subject: Additional Supplemental Remedial Investigation Activities Work Plan
Ardsley, LLC (Former Akzo Nobel Pilot Plant Site), ID #C360146
Ardsley, New York

Dear Mr. Kilmer:

Brown and Caldwell Associates (BC) submits this letter work plan for notice of implementing additional Supplemental Remedial Investigation (SRI) activities. The work plan describes the scope of work and procedures for implementation of additional investigation activities at the Former Akzo Nobel Pilot Plant Site (ID Number C360146) (hereafter referred to as the "Site"). This plan was prepared for EnviroAnalytics Group LLC (EAG) on behalf of Ardsley, LLC. The scope of work for this investigation is based on receipt of preliminary unvalidated analytical data collected during the field activities completed in accordance with the "Ardsley, LLC Site #C360146, Response to NYSDEC Requests for Modifications, Remedial Investigation Report and Remedial Action Work Plan," dated December 23, 2019 and approved by the New York State Department of Environmental Conservation (DEC) in a letter dated January 21, 2020.

The specific objective of these additional investigation activities is to further define the extent of the tetrachloroethene (PCE) source area identified adjacent to the west side of the former solvent shed, and to confirm that proposed placement of clean cover material in selected areas will address all exceedances of commercial soil cleanup objectives (CSCOs) in shallow soil.

Scope of Work

The SRI activities are described in the subsections below. Specific methods and procedures associated with these activities will be conducted in accordance with the following plans and guidance documents:

- Health and Safety Plan for Remedial Investigation Activities, Former Akzo Nobel Pilot Plant Site (Brown and Caldwell, April 2020) (referred to as "Health and Safety Plan").
- Final Supplemental Remedial Investigation Work Plan, Ardsley LLC (Former Akzo Nobel Pilot Plant Site), ID# C360146 (BC, May 2019).
- DER-10/Technical Guidance for Site Investigation and Remediation (NYSDEC, May 2010).

Field Activities

Utility Mark Outs and Clearance

Prior to conducting the intrusive activities described below, the planned locations for the soil borings will be marked in the field. Dig Safely New York will be contacted to clear subscribed underground utilities, and the Town of Greenburgh and/or the Village of Ardsley will be contacted to clear utilities that they maintain (e.g., sewer and water).

Some of the planned drilling and sampling locations may be adjusted to provide for adequate clearance from underground and aboveground utilities. The final locations for the soil borings will be determined in the field following the mark-out of underground utilities.

Clearance of subsurface utilities will be confirmed, as practical, at each drilling location by vacuum soil extraction or hand shoveling to remove the soil at each drilling location to a depth of approximately 5 feet below ground surface (bgs).

Soil Borings

Twelve (12) soil borings will be completed at the locations shown on attached Figure 1:

- BC-SB-1 through BC-SB-8
- BC-FE-SB-1
- BC-FE-SB-2
- BC-FE-SB-2A
- BC-FE-SB-5

The purpose of these soil borings is to collect representative samples of the soil mass to facilitate remedial design for the PCE-impacted soils.

A Community Air Monitoring Plan (CAMP) will be implemented that meets the requirements of the New York State Department of Health (NYSDOH) Generic CAMP provided in DER-10 during the advancement of the soil borings for the monitoring wells. The soil borings will be advanced using hollow stem augers or direct-push technology and soils will be sampled with either a GeoProbe® (macro core) or 2-inch stainless steel split-spoon sampler from the pre-cleared depth to approximately 15 feet bgs. The soil samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with a system after Burmister[1] and classified using the Unified Soil Classification System (USCS). The samples will also be field screened for indications of impacts based on appearance, odors or organic vapor concentration measurements using a photoionization detector (PID). Head-space screening with the PID will be conducted by immediately transferring a representative subsample of the soil to a clean glass jar and sealing its lid with aluminum foil or to a sealable polyethylene plastic bag (e.g., Ziploc®).

[1] Burmister, D M; "Principles and Techniques of Soil Identification"; Proceedings of the Twenty-Ninth Annual Meeting of the Highway Research Board Held at Washington, D.C. December 13-16, 1949.

To allow the sample to equilibrate, it will remain sealed for a period of time (approximately 15 minutes) and then the tip of the PID will be inserted through the foil, or though the plastic bag, and the maximum instrument reading will be recorded.

A total of forty-six (46) soil samples will be collected at pre-determined depths (as indicated on Table 1) and submitted for analysis of PCE and daughter products Trichloroethene (TCE) and cis-1,2-Dichloroethene (cis-1,2-DCE) by SW-846 Method 8260.

VOC analysis of soil samples will be conducted by a laboratory certified under the NYSDOH Environmental Laboratory Approval Program (ELAP) to provide Analytical Services Protocol (ASP)/Contract Laboratory Program (CLP) deliverables. The analytical results will be provided to the NYSDEC as an Electronic Data Deliverable (EDD) formatted to the NYSDEC's data submission requirements that are detailed on the NYSDEC's website (http://www.dec.ny.gov/chemical/62440.html). This will include: 1) populating the NYSDEC EDD with the analytical data; 2) validating the EDD using the database software application EQuIS™ from EarthSoft®, Inc.; and 3) submitting the validated EDD to the NYSDEC.

In addition to the soil sampling described above, four total samples will be collected from the BC-FE-SB-1, BC-FE-SB-2 and BC-FE-SB-5 locations and submitted for bench testing for proposed *in-situ* chemical oxidation (ISCO) remedial activities. Collection of soils from these borings are required for bench testing of three oxidants [Kperm, hydrogen peroxide, and oxygen biochem (persulfate and calcium peroxide)] and complete oxidant demand with persulfate.

The soil borings will be surveyed by a New York licensed surveyor. The survey will include location coordinates and ground surface elevations. Coordinates will be referenced to the State Plane coordinate system for New York using the North American Datum of 1983 (NAD 1983) in units of feet. Elevations will be referenced to the National Geodetic Vertical Datum (NGVD) of 1929 in units of feet.

Surface Soil Sampling

Surface soil sampling of the 0-2-inch interval will be completed at the nine locations shown on attached Figure 1 (SS-32 through SS-40). The purpose of these samples will be to confirm that imported cover material will cover unpaved exceedances of CSCOs.

One surface soil sample from each sample location will be collected from the 0-2-inch depth interval immediately below the vegetative cover and submitted for analysis for the contaminants that were found to exceed the CSCOs in the original samples (i.e., PCBs, PAHs and/or Copper) as specified in Table 1. Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH ELAP to provide ASP/CLP deliverables. Deliverables will be Category B as required for data validation. The laboratory deliverables will include an EDD formatted to the DEC's data submission requirements.

The surface soil sample locations will be surveyed by a New York licensed surveyor. The survey will include location coordinates and ground surface elevations. Coordinates will be referenced to the State Plane coordinate system for New York using the NAD 1983 in units of feet. Elevations will be referenced to the NGVD of 1929 in units of feet.

Groundwater Sampling

One (1) groundwater sample will be collected from MW-5 to be used as part of the ISCO bench test. Groundwater is required as part of the ISCO bench test to mix oxidants with soil. A total of four liters of groundwater will be collected.

The groundwater samples will be collected according to the United States Environmental Protection Agency (USEPA) low flow sampling protocol and in accordance with procedures outlined in the Groundwater Data Gap Investigation Work Plan.

Investigation-Derived Waste

Investigation-derived waste (IDW) generated during the investigation activities will include soil cuttings, equipment decontamination water, purge water, disposable sampling equipment, and personal protective equipment (PPE). The waste will be containerized in DOT approved, 55-gallon drums, which will be labeled to identify their contents and temporarily staged on site. The appropriate treatment/disposal will be arranged based on the characterization of the waste streams.

Data Evaluation and Reporting

Laboratory results for the soil samples will be forwarded to a qualified data validator for preparation of a Data Usability Summary Report (DUSR) in accordance with DER-10 Appendix 2B, Guidance for Data Deliverables and the Development of Data Usability Summary Reports. The DUSR will present a summary of data usability, including a discussion of qualified and rejected data and provide recommendations for resampling/reanalysis, as applicable.

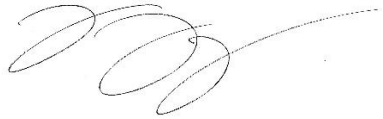
Field and analytical data collected as part of this activities described above will be included in the Remedial Investigation Report, described as part of December 23, 2019 response to comments letter.

Results of the ISCO bench testing will be provided as part of the Remedial Action Work Plan.

Please contact me to discuss any comments so that may be addressed promptly.

Very truly yours,

Brown and Caldwell Associates



Brian F. Taylor, P.G.
Hydrogeologist/Project Manager

cc: D. Dunn, EAG
F. Williams, BC

Attachments (2)

1. Figure 1
2. Table 1

Figure 1

4/2/2020

Legend

- Site Boundary
- Saw Mill River (Approximate)
- Proposed Soil Borings
- Proposed Surface Soil Samples
- Remaining Asphalt/Pavement
- Remaining Concrete Foundation Slab
- Trunk Sewer Line (66 in. Reinforced Concrete Pipe)
- Permanent Sewer Easement
- Proposed Soil Cover Areas (as shown on Figure 4-1 of RAWP)

Sources:
1) Base map developed based on figures prepared by First Environment (July 2017) and Paul J. Petretti (July 2019).
2) Aerial photo from NYSDOP 2016 Survey.

FIGURE 1
PROPOSED ADDITIONAL INVESTIGATION LOCATIONS
ARDSLEY LLC SITE (C360146)
GREENBURGH, WESTCHESTER COUNTY, NY

0 50 100
Feet

Author: BFTaylor Path: V:\Ramsey\ELT\Ardsley\Additional_SRIWP_PROPOSED_LOCATIONS_.mxd

Table 1

TABLE 1
SUPPLEMENTAL RI LOCATIONS, OBJECTIVES AND ANALYSES
ARDSLEY LLC SITE (C360146)
GREENBURGH, WESTCHESTER COUNTY, NY

Location ID	Targeted Area	Objective(s) and Analyses	Target Depth
Soil Borings			
BC-SB-1	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 4-5', 6-7', 8-9', 10-11', and 12-13' BGS and analyze for PCE, TCE and 1,2-cis-DCE	13 feet BGS.
BC-SB-2	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 8-9', 10-11', and 12-13' BGS and analyze for PCE, TCE and 1,2-cis-DCE	13 feet BGS.
BC-SB-3	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 4-5', 6-7', 8-9', 10-11', 12-13' and 14-15' BGS and analyze for PCE, TCE and 1,2-cis-DCE	15 feet BGS.
BC-SB-4	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 4-5', 6-7', 8-9', 10-11', 12-13' and 14-15' BGS and analyze for PCE, TCE and 1,2-cis-DCE	15 feet BGS.
BC-SB-5	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 4-5', 6-7', 8-9', 10-11', 12-13' and 14-15' BGS and analyze for PCE, TCE and 1,2-cis-DCE	15 feet BGS.
BC-SB-6	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 4-5', 6-7', 8-9', 10-11', 12-13' and 14-15' BGS and analyze for PCE, TCE and 1,2-cis-DCE	15 feet BGS.
BC-SB-7	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 8-9', 10-11', and 12-13' BGS and analyze for PCE, TCE and 1,2-cis-DCE	13 feet BGS.
BC-SB-8	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 4-5', 6-7', 8-9', 10-11', and 12-13' BGS and analyze for PCE, TCE and 1,2-cis-DCE	13 feet BGS.
BC-FE-SB-2A	PCE source area (former solvent shed)	1) Evaluate PCE concentrations in area targeted for ISCO Soil Mixing. Collect subsurface soil samples from approximately 4-5', 6-7', 8-9', 10-11', 12-13' and 14-15' BGS and analyze for PCE, TCE and 1,2-cis-DCE	15 feet BGS.
BC-FE-SB-1	PCE source area (former solvent shed)	1) Collect subsurface soil samples for ISCO bench test from approximately 2-3' and 10-12' BGS.	12 feet BGS.

TABLE 1
SUPPLEMENTAL RI LOCATIONS, OBJECTIVES AND ANALYSES
ARDSLEY LLC SITE (C360146)
GREENBURGH, WESTCHESTER COUNTY, NY

Location ID	Targeted Area	Objective(s) and Analyses	Target Depth
BC-FE-SB-2	PCE source area (former solvent shed)	1) Collect subsurface soil samples for ISCO bench test from approximately 6-9' BGS.	9 feet BGS.
BC-FE-SB-5	PCE source area (former solvent shed)	1) Collect subsurface soil samples for ISCO bench test from approximately 2-3' and 11-13' BGS.	13 feet BGS.
Surface Soil Samples			
SS-32	Soil Cover Area B, north side	Delineate lateral extent of TCL PAHs and copper in surficial soil.	0-2 inches below overlying vegetative cover
SS-33	Soil Cover Area B, south side	Delineate lateral extent of TCL PAHs and copper in surficial soil.	0-2 inches below overlying vegetative cover
SS-34	Soil Cover Area C, west side	Delineate lateral extent of PCBs in surficial soil.	0-2 inches below overlying vegetative cover
SS-35	Soil Cover Area D, north side	Delineate lateral extent of TCL PAHs in surficial soil.	0-2 inches below overlying vegetative cover
SS-36	Soil Cover Area D, east side	Delineate lateral extent of TCL PAHs in surficial soil.	0-2 inches below overlying vegetative cover
SS-37	Soil Cover Area E, north side	Delineate lateral extent of TCL PAHs in surficial soil.	0-2 inches below overlying vegetative cover
SS-38	Soil Cover Area E, west side	Delineate lateral extent of TCL PAHs in surficial soil.	0-2 inches below overlying vegetative cover
SS-39	Soil Cover Area E, south side	Delineate lateral extent of TCL PAHs in surficial soil.	0-2 inches below overlying vegetative cover
SS-40	Soil Cover Area E, east side	Delineate lateral extent of TCL PAHs in surficial soil.	0-2 inches below overlying vegetative cover

Abbreviations:
BGS - below ground surface
cis-1,2-DCE - cis,1-2-Dichloroethene
PAHs - Polycyclic Aromatic Hydrocarbons
PCBs - Polychlorinated Biphenyls
PCE - Tetrachloroethene
TAL - Target Analyte List