NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road, Avon, NY 14414-9516
P: (585) 226-5353 I F: (585) 226-8139
www.dec.ny.gov

September 20, 2022

Mr. Dan Noll
Labella Associates, D.P.C.
300 State Street, Suite 201
Rochester, New York 14614

Re: Remedial Action Work Plan
Eldre Corporation
Site No.: C828182
Henrietta (T), Monroe (C)

Dear Mr. Noll:

The New York State Department of Environmental Conservation (Department) and New York State Department of Health (NYSDOH) (collectively known as the State) have completed a review of the Remedial Action Work Plan RAOC #3 (RAWP) dated August 2022, for the Eldre Corporation site (Site) located at 1500 Jefferson Road and 55 Hofstra Road, Town of Henrietta, New York. Based on the information presented in the RAWP, the RAWP is conditionally approved based on the clarifications, modifications, and conditions presented below.

1. In addition to the remedial activities detailed in the RAWP, the Department is requesting a site-wide groundwater monitoring well inventory, groundwater elevations, and a groundwater sampling event to be completed. Groundwater sampling logs will be completed for each groundwater monitoring well sampled. The groundwater sampling logs must indicate the sampling methodology, if NAPL screening was completed, and if using low-flow sampling methodology the depth of the sampling intake. The groundwater water samples will be analyzed at an ELAP certified laboratory, the analytical data package will be Cat B, and a data usability summary report will be completed. The analytical parameters for the groundwater sampling event will TCL VOCs + TICs and MTBE. The analytical results will be presented in the Site's Final Engineering Report (FER) and will include summary tables (including historical groundwater data), Site figures presenting the data, and all supporting documentation will be included in the FER. All wastes generated as part of the groundwater sampling event will be managed and disposed off-site in accordance with all applicable local, State, and Federal regulations. Disposal documentation will be provided as supporting documentation in the FER.

2. The Department understands that the PE of record or an individual who is a direct report will be on-site during all remedial implementation activities such as, but not limited to, ground intrusive activities, all grading activities, importation of soil/fill material, any soil/fill material loadout activities, etc.

3. The Department understands that erosion and sediment controls will be implemented during all remedial activities. All erosion and sediment control measures implemented during the remedial activities will be in accordance with the Department's current standards and guidance (See the

Department's website - https://www.dec.ny.gov/chemical/8694.html) as well as industry standards.)

4. Certification: The Department understands that the RAWP is not an interim document as indicated in the certification language in the document submitted.

5. Section 3.5.1; Sub-slab Depressurization System; Page 9: All details associated with the additional indoor air sampling and as-built drawings for the SSDS will be provided in the Site's FER. The conditionally approved CCR dated September 2021 along with the Department's letter will be included as an appendix in the FER.

6. Section 4.0; Final Remedy; Page 14: The 3rd bullet, RAOC #3, not only applies to SS-2 area of the Site but also applies to the 55 Hofstra Road parcel.

7. Section 4.1.1; Sub-slab Depressurization System; Page 14: It is indicated that the CCR contained as-built drawings for the SSDS. The Site's FER will include the as-built drawings for the SSDS as well as any additional sampling completed. The conditionally approved CCR dated September 2021 along with the Department's letter will be included as an appendix in the FER.

8. Section 4.2; Institutional Controls; Page 14: The environmental easement as details the uses for the Site – 1500 Jefferson Road as restricted industrial and 55 Hofstra Road as restricted commercial.

9. Section 4.2.1; Site Management; Page 14 & 15: The Department has provided comments on the draft Site Management Plan (SMP) dated September 2021. The Department is awaiting a revised SMP to be submitted for review.

10. Section 5.0; RAOC #3 Final Remedy – Cover System: The Department understands that during all the remedy implementation activities at the Site appropriate vehicular and pedestrian traffic control and safety measures will be implemented to ensure the safety of the workers implementing the remedy and those not associated with remedy implementation. The details of the vehicular and pedestrian traffic control measures implemented and any issues surrounding the measures will be presented in the Site's FER. The Department understands that the previous comment associated with Labella oversight will be adhered to as well.

11. Section 5.1.1; 1500 Jefferson Road Impacted Surface Soils; Page 15 & 16: The Department understands that all soil/fill material from the 0–1-foot interval will be excavated. The Department understands that the existing tree and shrubbery will be removed and disposed accordingly off-site. The Department understands that standard field screening of soils within the excavation area will be completed. The area will be backfilled with imported fill material that will be approved by the Department project manager prior to importation to the Site. The Department understands that a demarcation layer will be place within the entire removal area. The total thickness/depth of cover material will be 1 foot after settling/compaction. The upper six inches of soil/fill material will be of sufficient quality to maintain a vegetative layer. The Department understands that the utilities present in the area is on a concrete slab.

12. Section 5.1.2; 55 Hofstra Road Impacted Surface Soils; Page 16: The Department understands that the fence along the northern portion of the Site will be removed as shown on the attached figure and will be re-installed at the conclusion of the Site cover system installation. Temporary site control will be implemented during the remedy installation phase. The Site cover system will be extended to ensure that all impacted material will be addressed.

The Department understands that the erosion and sediment controls measure will be implemented at 55 Hofstra Road parcel to mitigate any erosion and sedimentation issues occurring due to the remedy implementation activities. The Department understands that the cover material will be 1 foot thick after all settling and compaction has occurred. The Department understands that a demarcation layer will be placed across the entire area receiving the cover system.

13. Section 5.2; Imported Materials; Page 16 & 17: Non-soil/fill material must meet the 80 sieve analysis as detailed in Section 5.4 of DER-10. All sampling and laboratory analysis of soil/fill material will be in accordance with the Department's current guidance. Note there is a new import form on the Department's public website.

14. Section 5.3; Demarcation Layer; Page 17: A demarcation layer will be placed prior to backfilling at 1500 Jefferson Road and 55 Hofstra Road.

15. Section 5.4; Health and Safety and Community Air Monitoring; Page 17: The Community Air Monitoring Plan (CAMP) will be implemented for all ground intrusive activities as well as activities in which soil/fill material is being handled at the Site. An individual from Labella will be always on-site during CAMP monitoring activities. If any of the excavation activities are within 20 feet of a building, then the Special CAMP will be implemented. The Special CAMP is attached for your convenience. All CAMP and Special CAMP monitoring data will be provided as supporting documentation in the Site's FER.

16. Section 6.0; Schedule and Deliverables; Page 17: The Department understands that the Final Engineering report will be developed in accordance with the Department's s current guidance documents and the Department's FER template will be used. The Site's FER will contain as-built drawings for all engineering controls installed at the Site. The as-built drawings will have a PE stamp (licensed in NYS and in good standing) and signature as detailed in the Department's guidance document. The FER will contain the certification language with no modifications as presented in the Department's FER template. The Department understands that all supporting documentation will be provided in the FER such as, but not limited to, CAMP and Special CAMP monitoring data, field logs, bills of lading, weigh tickets, waste disposal documentation, etc.

Within fifteen (15) days of the date of this letter and prior to any fieldwork activities associated with remedy implementation, the Applicant must elect in writing (electronic notification is acceptable) one of the following options:

- Option A: Accept the modified work plan;
- Option B: Invoke dispute resolution as set forth in 6 NYCRR Part 35-1.5(b)(2); or
- Option C: Terminate the Brownfield Cleanup Agreement in accordance with 6 NYCRR Part 375-3.5.

If the Applicant chooses to accept Option A then this letter becomes part of the approved Remedial Action Work Plan RAOC #3 dated August 2022. Also, if Option A is chosen then a copy of the approved Remedial Action Work Plan RAOC #3 dated August 2022 along with this letter attached must be placed in the document repository within 1 week of accepting Option A and prior to any fieldwork activities associated with remedy implementation. Please provide notification to the Department that the Remedial Action Work Plan RAOC #3 dated August 2022 and a copy of this letter have been placed in the document repository (electronic notification is acceptable).

The State seeks to resolve the outstanding differences in a mutually agreeable manner, which addresses the requirements of the Brownfield Cleanup Agreement and associated work plans. If you or your technical team has any technical questions, concerns, or need further assistance with the Site, please feel free to contact me at 585-226-5354 or via e-mail at charlotte.theobald@dec.ny.gov. If you or your legal team has any legal questions or concerns, please contact Clayton Hale at 585-226-5369 or via e-mail at clayton.hale@dec.ny.gov .

Sincerely,

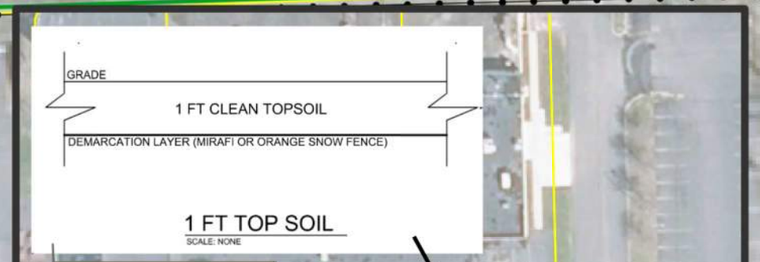
Charlotte B. Theobald
Assistant Engineer

ec:
Harvey Erdle (Eldre Corporation)
Dana Stanton (Nixon Peabody LLP)
Scott H. Reisch (Hogan Lovells LLP)
Charles Rine (Groundwater Sciences)
Alex Kralles (MERSEN USA)
Ann Barber (Labella)
Justin Deming (NYSDOH)
Julia Kenney (NYSDOH)
Mirza Begovic (MCHD)
Clayton Hale (NYSDEC)
David Pratt (NYSDEC)
Todd Caffoe (NYSDEC)

Fence to be removed.

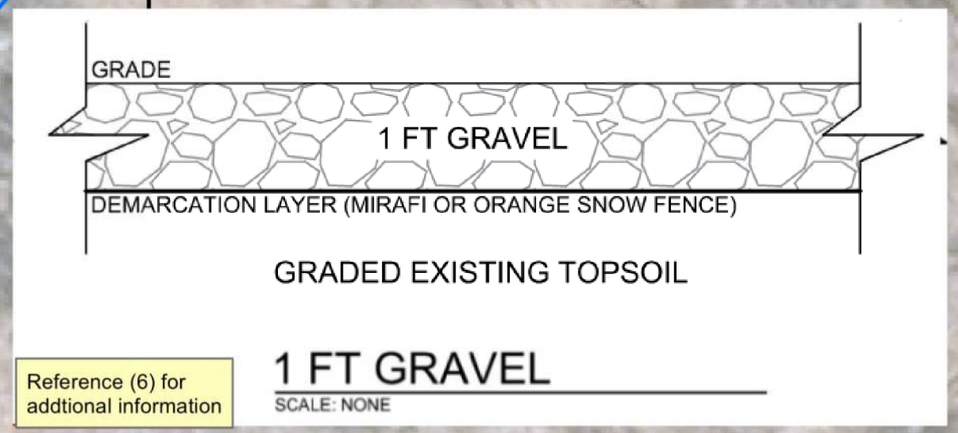
Cover System will extend to the fence line

Cover System will stop 5-ft before the creek bank



Reference (5) for additional information

RAOC #3 Located in front of the Site Building



Reference (6) for addtional information

Legend

- Manhole
- Fence
- Edge Of Creek
- Creek Breakwall
- Parking
- Roadway
- Easement
- RAOC #3
- Approx Sewer Location
- Site Parcel Boundaries

Notes:

1. Parcel boundaries are approximate and extrapulated from Monroe County Real Property data.
2. Aerial image obtained from Monroe County GIS 2009 and may not represent current conditions.
3. Survey Property Line was taken by O'Neill-Rodak Land Surveyoyrs in February 2022.
4. Site Features were measured with the Arrow Gold in February 2022.
5. The surface soils surrounding SS-02 will be removed to 1-ft bgs and backfilled with clean imported topsoil that has been approved by the NYSDEC.
6. The impacted soils from SS-2 will be placed on the surface soil at 55 Hofstra Road, which will then be covered with 1-ft of imported materials (crushed stone).

LaBella
Powered by partnership.

ELDRE CORPORATION
BCP SITE C828182

1500 JEFFERSON ROAD
AND 55 HOFSTRA ROAD

REMEDIAL ACTION
WORK PLAN

FINAL REMEDY

N
W E
S

1 inch = 40 feet
Intended to print as 11" x 17".

212721.01

FIGURE 4

Path: I:\Eldre Corporation\212721.01 - BCP Removal Phase\Drawings\RWP\Figure 4 RAOC 3 Cover cap.mxd

CAMP Special Requirements

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

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

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

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

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

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

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

Remedial Action Work Plan
RAOC #3
Eldre Corporation
NYSDEC BCP Site No. C828182

Location:

Eldre Corporation
1500 Jefferson Road & 55 Hofstra Road
Town of Henrietta
Monroe County, New York

Prepared for:

Mr. Harvey Erdle
16622 Sweet Bay Drive
Delray Beach, FL 33445
&
Alex Kralles
Mersen USA SPM Corp.
1500 Jefferson Road
Rochester, NY 14623

LaBella Project No. 212721.01

August 2022

\\DE - 003058/000004 - 3795036 v1

Table of Contents

Figures

Appendices

Certification

I, Daniel Noll certify that I am currently a NYS registered professional engineer and that this Interim Remedial Action 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).

081996	8/25/2022	
NYS Professional Engineer #	Date	Signature

1.0 INTRODUCTION

LaBella Associates, D.P.C. ("LaBella") is submitting this Remedial Action Work Plan (RAWP) for the property located at 1500 Jefferson Road and 55 Hofstra Road, located in the Town of Henrietta, Monroe County, New York, New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) Site #C828182. Hereinafter, this property will be referred to as "the Site." A Project Locus Map is included as Figure 1.

LaBella has completed a Remedial Investigation (RI) on behalf of Mersen USA SPM, Corp. ("Mersen"), formerly known as Mersen USA Rochester-NY Corp. and Eldre Corporation, at the Site, conducted during several distinct events from 2013 to 2017. A RI report was submitted to the NYSDEC in May 2018 and conditionally approved August 9, 2021. LaBella submitted a Remedial Alternatives Analysis (RAA) to the NYSDEC on September 3, 2021. The NYSDEC sent a letter to LaBella with comments on the RAA report dated October 5, 2021. LaBella revised and resubmitted the RAA on January 31, 2022, with a letter summarizing the revisions/responses to the NYSDEC comments. The LaBella response letter indicated to the NYSDEC that a RAWP will be developed to address the comments and concerns as they relate to RAOC #3.

1.1 Site Description and History

The Site consists of four (4) contiguous tax parcels totaling approximately 6.72 acres, as summarized in the following table and shown on Figure 2.

Parcel Address (collectively the "Site")	Section No.	Block No.	Lot No.	Acreage
1500 Jefferson Road, Henrietta, NY 14623	162.08	1	27.11	1.82
1500 Jefferson Road, Henrietta, NY 14623			27.12	0.14
1500 Jefferson Road, Henrietta, NY 14623			27.21	1.46
55 Hofstra Road, Henrietta, NY 14623			24	3.30

The 1500 Jefferson Road parcels are improved with a ±97,250 square foot, split-level building that is primarily utilized for industrial/manufacturing purposes, with office space in the southern portion and manufacturing areas in northern portion of the building. This main manufacturing building (i.e., the "1500 Jefferson Road building") is comprised of four (4) separate additions. The 1500 Jefferson Road building has a concrete slab-on-grade foundation, with the exception of the southern portion of the structure, which has a basement underneath the office space. Asphalt-paved parking lots and driveways are located north, south, and east of the 1500 Jefferson Road building. There is limited vegetative cover on the 1500 Jefferson Road parcels, with the exception of a small grassy area on the southwestern portion of the parcels and some small landscaped areas near Jefferson Road.

The 55 Hofstra Road parcel is improved with a ±6,860 square foot building, and asphalt-paved parking lots and driveways surround this structure. This smaller building is not routinely occupied but used as a maintenance and storage building for the Site. There are some vegetated drainage swales on the southwestern portion of the 55 Hofstra Road parcel, as well as along its western and northern property lines. In addition, there is approximately 0.6 acres of vegetated area on the eastern portion of the 55 Hofstra Road parcel.

The Site is currently zoned for commercial (55 Hofstra Road parcel) and industrial uses (1500 Jefferson

Parcels) and is located in an urban area of the Town of Henrietta.

The parcels comprising the Site are owned and operated by Mersen USA SPM Corp ("Mersen"), formerly known as Eldre Corporation and then Mersen USA Rochester-NY Corp. A Site access agreement is in place between Mersen, Eldre, and LaBella. Manufacturing activities at the Site produce electrical components (i.e., bus bars)

All of the properties immediately adjacent to the Site are industrial and commercial. The closest residential zoned property is approximately 0.3 miles to the east of the Site. The nearest agricultural use is approximately 1.25 miles to the north of the Site. The properties bordering the Site are summarized in the following table.

Direction From Site	Owner	Address	Property Usage
North	3131 Winton Road Assoc., LLC	3131 Winton Road	Wegmans Distribution Center
Northwest	Harris Communications	100 Hofstra Road	Undeveloped Land
South	1555 Jefferson Road, LLC	1555 Jefferson Road	Manufacturing
Southwest	Sugar Creek Stores, Inc.	1477 Jefferson Road	Retail Gasoline Station
East	Plaza at Win-Jef, LLC	1-37 Hofstra Road	Retail Plaza
East	Bowl A Roll, Inc.	1560 Jefferson Road	Bowling Alley, Commercial Retail
East	Atlantic Refining & Marketing Corp	1540 Jefferson Road	Retail Gasoline Station
East	1530 Jefferson Road, LLC	1530 Jefferson Road	NYSDOT Regional Headquarters
West	Harris Corporation (Formerly Xerox)	1400 Jefferson Road	Industrial*

* Parcel is in the State Superfund Program and is listed as a Class 4 Inactive Hazardous Waste Disposal Site (Site #828069). The impacts at the Site include chlorinated solvents (PCE, TCE, 1,1,1-TCA, 1,1-DCE, 1,1-DCA, Methylene Chloride and Vinyl Chloride).

Based upon review of previous environmental documents, the Site was utilized as farmland until the 1950s, when the Site was first developed by Fannon Metal Industries. According to historical records, the property appears to have been shared with P&F Metal and Finishing during the late 1960s. There appears to be no readily available historical information regarding whether the former occupants of the Site used hazardous chemicals or generated hazardous waste. Review of an aerial photograph of the Site dated 1970 identifies an apparent retention pond in the northwestern portion of the 1500 Jefferson Road Parcel with a potential drainage feature from the building to the pond area. These features also are present in aerial photographs dated 1961 and 1976.

Mr. Jack Erdle transferred the property to Norma Erdle in 1974 and Norma transferred the property to Eldre Corporation in 2006. The County of Monroe Industrial Development Agency (COMIDA) transferred title to the 55 Hofstra Road Parcel to Eldre Corporation in late 2011. In November 2012, in a stock transaction, the former shareholders of Eldre Corporation sold their shares in Eldre Corporation, but Eldre Corporation continued to own the Site. In 2016, Eldre Corporation changed its name to Mersen USA Rochester-NY, Corp.

and in 2019 changed it to Mersen USA SPM Corp. The Site is currently owned and operated by Mersen USA SPM Corp., Corp., formerly known as Eldre Corporation and Mersen USA Rochester-NY Corp.

2.0 STANDARDS CRITERIA AND GUIDANCE

This section identifies the Standards, Criteria and Guidelines (SCGs) for this RAWP. It should be noted that the SCGs are for comparison purposes and do not reflect the cleanup goals. The SCGs for soil, groundwater and soil gas/soil vapor for this RAWP are provided below.

Soil SCGs

The SCGs for this RAWP are:

- 6 NYCRR Subpart 375-6.8(a) Remedial Program Soil Cleanup Objectives (RPSCOs) for Unrestricted Use
- 6 NYCRR Subpart 375-6.8(b) Remedial Program Soil Cleanup Objectives (RPSCOs) for the Protection of Groundwater
- 6 NYCRR Subpart 375-6.8(b) RPSCOs for the Protection of Public Health –Industrial Use
- 6 NYCRR Subpart 375-6.8(b) RPSCOs for the Protection of Public Health –Commercial Use

Groundwater SCGs

The SCGs for groundwater used in this RAWP are the 6 NYCRR Part 703 Groundwater Quality Standards.

Soil Gas and Vapor SCGs

Currently, no state regulatory (NYSDEC or New York State Department of Health (NYSDOH)) guidance values exist for soil gas.

Sub-Slab Soil Vapor and Indoor Air SCGs: The NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 and all subsequent updates (including the USEPA Building Assessment and Survey Evaluation (BASE) Database (90th Percentile), in Appendix C of the NYSDOH document) is utilized for the SCG for soil vapor and indoor air.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

3.1 *Remedial Investigation Fieldwork*

The BCP RI fieldwork included advancing soil borings, installing temporary overburden groundwater monitoring wells, constructing permanent shallow and deep overburden groundwater monitoring wells at the Site, collecting surface soil samples from the Site, and conducting a SVI evaluation in the 1500 Jefferson Road building. RI groundwater sampling was conducted during several distinct events. The first round of groundwater sampling was conducted in May 2014 and a second round of groundwater sampling was conducted in September 2014. The following table indicates the total number of samples collected and analyzed during previous investigations.

Sampled Media	Sample Quantities
Surface Soil Samples	13
Test Boring Soil Samples	97
Open Borehole Groundwater Samples	4
Permanent/Finished Monitoring Well Groundwater Samples	19
Temporary/Removed Monitoring Well Groundwater Samples	16
Sub-slab Soil Vapor/ Indoor Air/ Outdoor Air	12/ 16/ 2

Notes:

- Test boring soil samples exclude PNOD and TOC samples which were collected for remedial design purposes.
- Surface soil sample quantity includes total number of discrete sample locations; some samples were composited for analysis of parameters other than VOCs. One planned sub-slab soil vapor sample could not be collected due to water in the tubing during the attempted sample collection.

Although most soil and groundwater samples were submitted for analysis of volatile organic compounds (VOCs) only, select soil and groundwater samples collected during the RI were submitted for analysis of the following "full suite" laboratory parameters which include:

- United States Environmental Protection Agency (USEPA) Target Compound List (TCL) VOCs and tentatively identified compounds (TICs)
- USEPA TCL semi-volatile organic compounds (SVOCs) and TICs
- Target Analyte List (TAL) Metals and Cyanide
- Polychlorinated biphenyls (PCBs)
- Pesticides

3.2 *Remedial Alternatives Analysis Investigation*

A RAA Investigation was completed in November 2017 in accordance with the RAA Investigation Work Plan dated August 2015 and approved by the NYSDEC in a letter dated October 23, 2015. In addition, two pilot tests were completed during the pre-remedial design phase as discussed in Section 3.4.

During the RAA investigation, overburden soil borings were completed to further define the vertical and horizontal extent of VOC impacts proximate the northern portion of the 1500 Jefferson Road building and to collect samples for total organic content (TOC) analysis for remedial design purposes. Two (2) interior (SB-235 and SB-236) and two (2) exterior (SB-234 and SB-237) soil borings were advanced to depths ranging from 30-31 feet bgs.

VOCs detected above the 6 NYCRR Part 375-6.8(a) RPSCOs for Unrestricted Use and 375-6.8(b) RPSCOs for Protection of Groundwater include TCE in SB-234 (12'), SB-235 (14'), SB-235 (18'), SB-235 (21.5'), Duplicate (SB-235 [21.5']) and SB-236 (14') and cis-1,2-dichloroethene in SB-235 (14'), Duplicate (SB-235 [21.5']), and SB-235 (21.5'). The concentration of TCE in SB-236 (14') was 1,620 ppm, which represents the greatest concentration of TCE in soil identified at the Site to date.

Eight (8) soil samples were also analyzed for TOC by Accutest Laboratories using ASTM method D2974 for remedial design purposes. TOC ranged from 0.2% to 16.2 % with an average (mean) of 8.2% and median of 9.2%.
In order to assist with remedial selection and design, falling head hydraulic conductivity slug testing was completed for select groundwater monitoring wells at the Site. Hydraulic conductivity was calculated for each well tested using AQTESOLV (version 4.5) software and the Bouwer and Rice (1976) Method. Hydraulic conductivity ranged from 1.689×10^{-7} to 2.86×10^{-5} feet/ second or 0.01 to 2.5 feet/day.

3.3 *Remedial Investigation Findings*

The RI evaluated three Areas of Concern (AOC) at the Site. The Conceptual Site Model below summarizes the overall RI findings and it is based on historic information, RI data, and modeling of contaminant patterns:

1. **AOC 1 – Current Operations (including recent TCE Degreasing; according to the current owner, the use of TCE at the Site ceased in 2015):**

   Soil borings (MW-14, LB-1, SB-206, SB-1, SB-222) and monitoring wells (MW-1, MW-11, MW-14 and MW-26) installed in proximity to and downgradient of the TCE degreasing area do not indicate that a release from this degreaser has resulted in any significant impacts (although some low-level impacts were identified in several of these borings/wells). Moreover, this degreaser was enclosed with secondary containment and was not connected to any exterior piping. As such, the degreasing area in the eastern portion of the building does not warrant any further investigation or remediation given the industrial use of the Site now and for the foreseeable future and an anticipated Site Management Plan.

2. **AOC 2 - Historic Operations (including former Pond Area**):

   Former Pond Area: Numerous soil borings and wells were advanced/installed as part of the RI to evaluate the historic use of the Site and the former pond area. CVOCs were identified in the borings/wells advanced in the former pond area (SB-212/MW-16 and SB-230A/MW-33); however, these impacts are considered to be associated with an historical source area in soil emanating from beneath the northern portion of the building.

   Other Historic Operations:

   SB-226 and SB-236 VOC Impacts: The impacts within the northern portion of the building appear to be associated with historic (pre-Eldre) operations. The extent of impacts in the soil at significant concentrations is limited to beneath the structural fill materials as observed during the RI work. The structural fill materials were installed at the Site as part of the 2000 building addition which removed soils above this area at that time. Based on the RI findings, the source area impacts are limited to approximately 8 to 16 feet below ground surface (bgs) (or about 500 feet to 492 feet mean sea level (MSL)). Vertical soil sampling from worst-case locations (e.g., SB-226 and SB-236) indicated decreasing concentrations of TCE at the 15 feet depth with concentrations of TCE tapering off to below 6 NYCRR Part 375-6.8 Unrestricted and Protection of Groundwater SCOs at 21.5 feet below finished floor.

   The highest concentrations of CVOCs in soil identified during the RI were located proximate SB-226 and SB-236 and between depths of 12 feet to approximately 15 feet bgs. The RI determined that these impacts had not migrated any significant distance. This conclusion was based on numerous soil samples in and around the identified source area. Specifically,

the highest CVOC concentration detected during the RI was in sample SB-236 (14') at 1,673 ppm total CVOCs, but samples collected laterally from within 10 feet to 15 feet and at similar depth intervals and from samples above and below this interval were significantly lower. Samples SB-216 (12'-13'), SB-217 (12'-12.5'), SB-224 (8'-10' & 15'), SB-225 (7'-8' & 16'), SB-228 (11'-12'), SB-235 (26' and 31') and SB-236 (24' and 31') had detected CVOC concentrations that were orders of magnitude lower than the concentrations detected in sample SB-236 (14'). The limited migration of impacts within the soil matrix may be due to fine grained soils (clays and silts) which tend to retard contaminants (refer to soil boring logs for samples SB-216, SB-224, SB-225, SB-228, SB-235 and SB-236 which note the presence of fine clays and silts from 9 to 16 feet in depth). However, TCE concentrations identified were greater than 1% of the solubility of TCE (1,100 mg/L) and thus the RI concluded that Dense Non-Aqueous Phase Liquid (DNAPL) were likely to be present in this area (although not observed directly).

The migration of CVOCs in dissolved phase groundwater from this source area is presumed to be influenced by the overall groundwater flow at the Site to the north and due to sand and gravel lenses identified in numerous soil borings. Specifically, lenses of gravel and/or sand at depths greater than 9 feet bgs have been observed in proximity to and downgradient of the source area and are summarized below:

- SB-6 (pre-BCP) between 15 to 16 feet.
- SB-208/MW-15 between 8 to 10 feet and between 13 to 14 feet.
- SB-218/MW-21 between 13 to 13.5 feet.
- SB-224 at 15.5 feet and to the bottom of the boring at 16 feet.
- SB-226/MW-30 between 12 to 13 feet.
- SB-230A/MW-33 between 11.5 and 15 feet.
- SB-233/MW-36 between 11 to 14 feet and between 20 to 34 feet.
- SB-234 between 9 and 10 feet and 20 to 24 feet (no recovery from 20 feet to the bottom of the boring at 30 feet).
- SB-235 between 20 and 24 feet and 28 feet to the bottom of the boring at 31 feet.
- SB-236 between 19 and 23 feet and 27 feet to the bottom of the boring at 31 feet.
- SB-237 between 18 feet and the bottom of the boring at 30 feet.
- SB-238 between 17 feet and the bottom of the boring at 20 feet.
- SB-239 between 11 and 13.5 feet.
- SB-240 between 9 and 9.5 feet and between 16 and 17 feet.
- SB-241 between 16 and 17 feet.

The sanitary sewer transects the site from the west to the northeast as shown on Figure 5. Groundwater contouring completed during the RI indicates that the sanitary sewer influences the groundwater flow at the site in the uppermost portions of the water table. However, the data obtained through the RI did not indicate that contaminants migrate within the sanitary sewer bedding at significant levels. Although some migration via this pathway may occur, the lack of CVOCs in samples in proximity to the sanitary sewer (e.g., SB-201 and MW-32) and in soil and groundwater samples from beneath the invert of the sewer (and collected from between the sewers, SB-229/MW-2), indicate that this pathway did not represent a significant concern for downgradient impacts. Rather, CVOCs have been documented to be to the north and west of the sewer and it is presumed that the numerous lenses of gravel/sand conveyed the CVOCs beneath the sewer line and to the north of the sewer.

Although the connectivity of the sand and gravel lenses was not confirmed through direct testing, connections between these lenses can be inferred from the contaminant distribution pattern and the number of lenses identified supporting the likelihood that such sand and gravel lenses provide preferential pathways for migration to the north and northwest consistent with the groundwater flow direction and the fact that the contaminants migrated beyond the sanitary sewer.

MW-12 VOC Impacts: The source of CVOC impacts within this portion of the building are unknown; however, based on interviews with Eldre representatives, it is likely these are associated with historic operations prior to Eldre ownership since there are no known operations during Eldre ownership that utilized TCE in this area. The impacts appeared to be centered around the area of MW-12 and extended to the north and northeast. Based upon available data, the RI determined that this appears to be a separate source area. Specifically, MW-22 was non-detect for CVOCs and is located between the source in the area of SB-236 and MW-12. The concentrations in this area were significantly lower than the SB-236 area and appeared highly degraded (50% breakdown compounds).

Miscellaneous Discrete Impacts: Several miscellaneous areas of impacts were also identified:

a. Surface Soils - low levels of pesticides (SS-1 and SS-2 at 1500 Jefferson Road and C1 and C2 at 55 Hofstra Road), metals (SS-1, SS-2, SS-3 and SS-4 at 1500 Jefferson Road and C1, C2 and C3 at 55 Hofstra Road) and SVOCs (SS-2 at 1500 Jefferson Road and C1, C2, and C3 at 55 Hofstra Road) were identified in surface soil and were likely associated with historic operations (such as pesticide applications), fill materials (SVOCs) and/or naturally occurring conditions (metals). The soil samples collected at 1500 Jefferson Road did not indicate significant or site-wide impacts and with the exception of one sample (SS-2) were all below the 6 NYCRR Part 375-6.8(b) Industrial Use SCOs. All three (3) composite sample locations collected from 55 Hofstra Road exceeded 6 NYCRR Part 375-6.8(b) Commercial Use SCOs for at least one (1) depth interval. Based on subsequent site walks of this area there are several mounds of soil/asphalt material that appear to have been placed in this area of the Site and the asphalt was likely the source of SVOCs in surface soils in this area.
b. Metals in Groundwater - Several metals were identified in groundwater at concentrations slightly above the Part 703 Groundwater Standards; however, these were not consistently detected and significant concentrations were not identified and metals in groundwater are not recommended for further evaluation or remediation.
c. MTBE in Groundwater - MTBE was identified in low levels in several groundwater samples -- specifically, monitoring wells MW-2, MW-16, and MW-35. The concentrations of MTBE were above the Part 703 Groundwater Standard (particularly the October 2013 and September 2014 groundwater samples from MW-16 at 16 ppb and 22 ppb, respectively, September 2014 groundwater sample from MW-2 at 660 ppb and May 2014 groundwater sample from MW-35 at 85.2 ppb); however, the fact that MTBE use and gasoline dispensation never occurred at the Eldre property, the location of these wells and groundwater flow direction all suggest that the detection of MTBE was due to an off-site source to the south. A gasoline filling station is located approximately 450 feet to the south.

3. **AOC 3 – Off-Site –** Borings SB-211, SB-231 and monitoring well MW-34 were completed along the western property line of the Site in proximity to the sanitary sewer in order to evaluate whether the VOCs that are being remediated by the adjacent property owner were potentially migrating onto the Site via groundwater or a preferential pathway associated with the sewer or sewer bedding. However, groundwater flow direction and lack of detected VOCs in MW-34 along the western property line suggests that there are no significant contributions from the sewer and bedding material from off-site sources onto the Site. Based upon laboratory analytical results associated with soil and groundwater samples collected from SB-229/MW-32 (advanced on the northeastern portion of the Site and between the pair of sewer lines that cross the Site) these sewer lines and any associated bedding materials are not considered to be acting as a significant preferential pathway for CVOCs to migrate to the northeast or off-Site in this direction. No further evaluation of off-site impacts is recommended.

The following summarizes the RI groundwater sampling results:

May 2014 Groundwater Sampling Results

The highest concentration of trichloroethene (TCE) (114 ppm) was reported in the groundwater sample collected from SB-225/MW-29. This temporary well was located in close proximity (±9 feet) to SB-216/MW-20, the TCE-impacted well installed inside the northern portion of the 1500 Jefferson Road building. TCE was also reported at elevated concentrations (i.e., above the NYSDEC Part 703 Groundwater Standard) in the three other wells installed in this interior area of the Site (SB-223/MW-27, SB-224/MW-28, and SB-226/MW-30).

TCE was also reported at concentrations above the NYSDEC Part 703 Groundwater Standard in permanent well SB-230A/MW-33 (installed in the soil boring near the western property boundary that was observed to contain a lens of gravel) and in temporary well SB-232/MW-35 (installed near the northeastern corner of the 1500 Jefferson Road building, to the east of the loading dock's concrete pad). The groundwater sample collected from temporary well SB-232/MW-35 was also reported to contain tetrachloroethene (PCE) and methyl tert-butyl ether (MTBE) at concentrations of 90.3 and 85.2 ppb, respectively, above NYSDEC Part 703 Groundwater Standards.

Cis-1,2-dichloroethene was reported at concentrations above the NYSDEC Part 703 Groundwater Standard in interior wells SB-223/MW-27, SB-224/MW-28, and SB-226/MW-30, as well as exterior wells SB-230A/MW-33 and SB-232/MW-35. Trans-1,2-Dichloroethene was also reported at a concentration slightly above the NYSDEC Part 703 Groundwater Standard in the groundwater sample collected from exterior permanent well SB-230A/MW-33.

Vinyl chloride, another TCE degradation product, was reported at a concentration slightly above the NYSDEC Part 703 Groundwater Standard (25.3 ppb) in interior well SB-224/MW-28.

No CVOCs were detected above laboratory detection limits in the groundwater sample collected from deep overburden well SB-233/MW-36.

September 2014 Groundwater Sampling Results

Most of the laboratory analytical results associated with the September 2014 Second Round of Groundwater Sampling were comparable to results obtained from prior rounds of groundwater sampling. The following exceptions should be noted:

- A reduction in the reported concentration of TCE in groundwater collected from interior well SB-222/MW-20, from 114 ppm in January 2014 to 25 ppm in September 2014;
- A reduction in the reported concentration of TCE in groundwater collected from interior well SB-216/MW-26, from 21.6 ppb in January 2014 to 3.7 ppb (i.e., below the NYSDEC Part 703 Groundwater Standard for TCE) in September 2014;
- A reduction in the reported concentration of TCE in groundwater collected from exterior well 230A/MW-33, from 87.3 ppb in May 2014 to 10 ppb (i.e., only slightly above the NYSDEC Part 703 Groundwater Standard for TCE) in September 2014; and
- An increase in the reported concentration of TCE in groundwater collected from exterior deep well SB-233/MW-36, from "non-detect" in June 2014 to 6.1 ppb (i.e., slightly above the NYSDEC Part 703 Groundwater Standard for TCE) in September 2014.

3.4 *Additional Testing/Investigations*

In addition to the above, two additional significant efforts were undertaken prior to the Remedial Alternatives Analysis and approval of the RI Report.

1. ISCO Pilot Test - During the pre-remedial design phase, two (2) pilot tests were implemented to evaluate the effectiveness of In-Situ Chemical Oxidation (ISCO) injections using pneumatic and hydraulic injection methods. Ultimately it was determined that a different remedial approach would be utilized. Additional details on the ISCO Pilot Test can be found in the RI Report and RAA Report. Off-Site SVI

Off-site SVI testing was completed at the eastern adjacent property addressed as 1530 Jefferson Road. Following the assessment, NYSDEC/NYSDOH determined that no further action was warranted related to off-Site SVI and the data was provided to the adjacent property owner at the direction of NYSDEC/NYSDOH on July 27, 2021. Work was completed in accordance with the NYSDEC-approved Off-Site SVI Work Plan dated December 3, 2019 and the *NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 and subsequent updates. Additional details on the ISCO Pilot Test can be found in the RAA Report.

3.5 *Interim Remedial Measures*

Two (2) Interim Remedial Measures (IRMs) have been completed at the Site and are summarized below. Refer to the individual reports for each IRM for details.

3.5.1 Sub-Slab Depressurization System (RAOC #1 and #2)

Soil vapor intrusion (SVI) testing was completed in 2017 which identified portions of the lower level of the 1500 Jefferson Road building which warranted mitigation in accordance with the *NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated 2006 and subsequent updates ("NYSDOH Guidance"). A sub-slab depressurization system (SSDS) was installed in the northern portion of the lower level in accordance with the IRM Work Plan dated September 2016, NYSDEC conditional approval dated

June 15, 2017, IRM Work Plan Addendum dated February 14, 2018, and associated NYSDEC conditional approval dated July 18, 2018. The SSDS was installed in 2018 and covers most of the lower level of the 1500 Jefferson Road building. Post-mitigation testing completed in April 2020 identified one (1) location, the Tool Room on the lower level, as an area as to which NYSDOH Guidance required Labella to "Identify Sources and Resample or Mitigate." SVI samples collected from the remainder of the building resulted in "No Further Action."

3.5.2 Electrical Resistance Heating (RAOC #1)

An electrical resistance heating (ERH) system was installed in RAOC #1 to treat CVOCs in soil and groundwater. The ERH system was installed in accordance with the IRM Work Plan dated September 2019, NYSDEC conditional approval dated January 30, 2020, and a revised work plan dated February 2020.

The ERH treatment area was installed across the entire oven room (approximately 40-ft by 40-ft) and north outside of the 1500 Jefferson Road building into the parking lot. The ERH system consisted of 19 electrodes (9 interior and 10 exterior) within the treatment area (approximately 2,700 sq. ft.) installed to depths of approximately 28-ft below finished floor with treatment occurring from 5 to 25-ft below finished floor (approximate 2,200 cubic yard treatment volume).

The ERH system operated from March 10, 2020 to May 11, 2020 at which point confirmatory sampling resulted in CVOCs below Unrestricted Use SCOs in soil and TCE below 500 ppb in groundwater. Baseline and confirmatory soil and groundwater results are summarized in the following tables:

ERH Baseline and Confirmatory Soil Results

Sample ID	Compound	Baseline October 2019 (ppm) (pre-ERH)	Confirmatory May 2020 (ppm) (ERH operating 52 days)	% reduction from ERH
SB-255-11-ft	Cis-1,2-DCE	3.4	ND (Duplicate 0.0006)	>99%
	PCE	2.2	ND	>99%
	TCE	15	0.00022 (Duplicate 0.00082)	>99%
SB-255-18ft	Cis-1,2-DCE	0.83	Not sampled*	NA**
	PCE	1.6	Not sampled*	NA**
	TCE	0.55	Not sampled*	NA**
SB-256-16ft/ SB-257-15ft	Cis-1,2-DCE	ND	ND	NA***
	PCE	1,600 (Duplicate 680)	ND	>99%
	TCE	30,000 (Duplicate 9,100)	0.0036	>99%
SB-257-19-20-ft/ 19.5-20ft	Cis-1,2-DCE	ND	ND	NA***
	PCE	0.073	ND	>99%
	TCE	4.8	ND	>99%
SB-258-9ft	Cis-1,2-DCE	0.82	0.00058	>99%
	PCE	0.34	ND	>99%
	TCE	29	0.0014	>99%
SB-258-12ft	Cis-1,2-DCE	0.24 (Duplicate 0.52)	ND	>99%
	PCE	1.9	ND	>99%

Sample ID	Compound	Baseline October 2019 (ppm) (pre-ERH)	Confirmatory May 2020 (ppm) (ERH operating 52 days)	% reduction from ERH
		(Duplicate 2.6)		
	TCE	28 (Duplicate 63)	0.00035	>99%
SB-260-11ft	Cis-1,2-DCE	0.028	ND	>99%
	PCE	ND	ND	NA***
	TCE	0.00047	ND	>99%
SB-260-16.5ft	Cis-1,2-DCE	0.14	ND	>99%
	PCE	ND	ND	NA***
	TCE	0.99	ND	>99%
SB-261-13ft	Cis-1,2-DCE	2.6	0.084	97%
	PCE	ND	ND	NA***
	TCE	0.072	0.022	69%
SB-261-21ft	Cis-1,2-DCE	0.49	Not sampled*	NA**
	PCE	ND	Not sampled*	NA**
	TCE	0.69	Not sampled*	NA**

*Locations were not sampled due to melted macro-core liners; however, baseline concentrations were relatively low.
** Percent reduction was not calculated due to lack of confirmatory sample.
*** Baseline and confirmatory samples were both non-detect.

ERH Baseline and Confirmatory Groundwater Results

Well ID	Compound	Baseline October 2019 (ppb) (pre-ERH)	Baseline January 2020 (ppb) (pre-ERH)	Confirmatory May 2020 (ppb) (ERH operating 52 days)	% reduction from ERH (greatest baseline concentration to May 2020)
MW-15-R*	Cis-1,2-DCE	95 (100 duplicate)	120	97 (Duplicate 97)	19%
	PCE	ND (ND duplicate)	ND	0.38 (Duplicate 0.38)	NA*
	TCE	130 (180 duplicate)	40	130 (Duplicate 140)	NA*
MW-20-R	Cis-1,2-DCE	6,200	9,500 (9,200 duplicate)	3.1	>99%
	PCE	3,100	1,800 (1,600 duplicate)	12	99%
	TCE	400,000	200,000 (190,000 duplicate)	350	>99%

** NA indicates concentrations were not reduced from the baseline sampling event. MW-15-R is in the location of the ISCO pilot test in which 385 gallons of sodium permanganate were injected into the subsurface in 2018 (i.e., prior to ERH baseline sampling). The relatively low ERH baseline concentrations are attributed to the sodium permanganate treatment which reduced the concentration of cis-1,2-DCE*

from 12,000 ppb in September 2014 to 95 ppb in October 2019 (99% reduction), PCE from 170 ppb in September 2014 to non-detect in October 2019 (>99% reduction), and TCE from 71,000 ppb in September 2014 to 130 ppb in October 2019 (>99% reduction). Because the ISCO pilot test had already reduced concentrations of these CVOCs by at least 99%, the ERH system did not further reduce these compounds in MW-15-R. The increases in concentrations from baseline to post-ERH are minor and the pre-ISCO concentrations in MW-15-R have been reduced by at least 99% overall.

An estimated 330 lbs of TCE were removed and treated via the ERH system based on air samples collected from the influent and effluent of the carbon treatment vessels which were analyzed by a laboratory via USEPA Method TO-15. NYSDEC approved decommissioning of the system in May and the system was decommissioned in May and June 2020.

3.6 *Remedial Areas of Concern*

The cumulative investigative work performed during the pre-BCP investigations, RI, and IRM work performed under the BCP identified the following areas that exceed the NYSDEC Part 375-6.8(b) Unrestricted Use SCOs and/or Part 703 Groundwater Standards and thus were evaluated in the Remedial Alternatives Analysis:

1. RAOC #1 - SB-226 and SB-236 VOC Area (1500 Jefferson Road): Chlorinated VOCs in soil and groundwater in the source area (i.e., SB-226 and SB-236) and migrating north in the parking lot. A SSDS was installed in the northern portion of the1500 Jefferson Road building to mitigate SVI in this area.
2. RAOC #2 - MW-12 VOC Area (1500 Jefferson Road): Chlorinated VOCs in soil and groundwater in proximity to MW-12 and migrating north into the parking lot. A SSDS was installed in the northern portion of the1500 Jefferson Road building to prevent SVI in the building.
3. RAOC #3 - Miscellaneous Discrete Soil Areas (1500 Jefferson Road and 55 Hofstra Road): Surface soil samples with SVOCs above Part 375-6.8(b) Commercial Use SCOs at 55 Hofstra Road and above Part 375-6.8(b) Industrial Use SCOs at 1500 Jefferson Road.

Fish and wildlife impacts were not identified during the remedial work.

3.7 *Geology & Hydrology*

Information on the geologic and hydrogeologic conditions presented herein are based upon previous environmental investigations of the Site and the subsurface investigations performed as part of the RI and pre-remedial design. Subsurface investigation methods have primarily included direct-push soil borings, rotary drill rig soil borings, and the installation of 1-inch and 2-inch diameter groundwater monitoring wells. Most subsurface investigation work has been limited to approximately 20 feet bgs, and investigations have been limited to the overburden soil formation beneath the Site. SB-233 extended to 34 ft. bgs, SB-234 and SB-237 extended to 30 ft. bgs, SB-235 and SB-236 extended to 31 ft. bgs and SB-241 extended to 25 ft. bgs.

Interior soil borings beneath the northernmost portion of the 1500 Jefferson Road building encountered a thick layer of sub-slab structural fill material (gravel with some sand) immediately below the concrete floor slab to approximately 8 to 9 feet below the finished floor elevation. Native soils, generally silty clay and clayey silt soils with lesser amounts of sand and/or gravel were encountered beneath the apparent sub-slab structural fill material in these soil borings. Interior soil borings that were completed to the south and within an older portion of the 1500 Jefferson Road building did not encounter this thick layer of sub-slab structural fill material; rather, native soils were generally encountered between 1.5 and 3 feet beneath the finished

floor elevation.

Beneath exterior asphalt pavement areas, soil borings have documented a layer of Sand and Gravel fill material that varies from approximately 1 to 4 feet in thickness. Underlying this fill material, native material consists of generally silty clay and clayey silt soils with lesser amounts of sand and/or gravel.

Several interior and exterior soil borings encountered a lens of gravel and/or sand at depths greater than 9 feet bgs. A layer of sand with lesser amount of silt and gravel has been found in some soil borings at depths between 15 and 20 feet bgs. In addition, several soil borings have noted a clay layer between 5 and 6 feet bgs.

The 2011 GSC investigation included installation of ten overburden groundwater monitoring wells and these wells indicated that groundwater beneath the Site generally flows to the north-northwest.

Groundwater contour maps have been generated as part of the RI using static water level data collected from accessible wells on the following dates:

- On June 27, 2014, static water levels were collected from fifteen (15) exterior and eight (8) interior groundwater monitoring wells; and
- On November 24, 2014, static water levels were collected from sixteen (16) exterior and eight (8) interior groundwater monitoring wells.

The June 2014 static water level data indicated groundwater generally flowing to the north-northeast at the Site; however, there is some influence on the groundwater flow by the sanitary sewer that bisects the Site. There are two sewer lines that cross the Site in a generally west-southwest to east-northeast orientation. Based on the available data, the sewer piping, and more likely the bedding material around the piping, influences groundwater flow at the Site. Based upon available mapping, instrument survey elevations, and field measurements, the invert elevations of the deeper sewer piping are at an elevation of ±490.75 feet to 490.15 feet, whereas groundwater elevations in the area of the sewer are modeled to be approximately +/- 497 feet in the area of the sewer. However, the groundwater elevation measured at MW-2 (located in proximity to the sanitary sewer) was substantially lower than the other wells located away from the sanitary sewer; which indicates that the sanitary sewer influences groundwater. To further evaluate this, a second groundwater contour map was developed that includes utilizing the invert elevations of the sewer manholes (i.e., assuming that the inverts are the groundwater elevation). Based on this assessment, additional contours were developed which show groundwater in the northern portion of the Site flowing south towards the sanitary sewer and south of the sewer groundwater flowing north towards the sewer (i.e., the sewer acting as a linear feature). The uppermost groundwater flow in the area of the sewer is to the northeast (i.e., groundwater above the sewer/bedding).

4.0 FINAL REMEDY

The following remedies were selected for each RAOC as detailed in the RAA and the response letter from the NYSDEC.

- RAOC #1 – Residual VOC Impacts in Soil and Groundwater Associated with Former Source Area (SB-226 and SB-236): Alternative 2 & 3 – Long-term Groundwater Monitoring and On-Site Management
- RAOC #2 – VOC impacts MW-12: Alternative 2 & 3 – Long-term Groundwater Monitoring and On-Site Management
- RAOC #3 – Surface soil Impacts: Alternative 2 – Removal of impacted surface soil at SS-2 and cover/cap

4.1 *Engineering Controls*

4.1.1 Sub-slab depressurization System

Engineering controls are warranted to protect building occupants from soil-vapor intrusion (SVI). A SSDS was installed in the northern portion of the 1500 Jefferson Road building to mitigate soil vapors that may enter the building through the floor slab (refer to Section 3.5.1). The SSDS is currently operating, and inspection and routine monitoring is specified in the SMP. As-Built drawings of the SSDS were included in the Construction Completion Report/ Final Engineering Report (CCR/FER).

4.1.2 Cover System

Refer to Section 5 of the RAWP for cover system details.

4.1.3 Long-Term Groundwater Monitoring

Based on the presence of VOCs above groundwater standards in RAOC #1 and RAOC #2, long-term groundwater monitoring will be completed. The monitoring plan is specified in the SMP.

4.2 *Institutional Controls*

Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- Requires the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- Restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;
- Requires compliance with the NYSDEC approved SMP which will address potential future subsurface excavations and SVI.

4.2.1 Site Management

A draft SMP has been prepared. The draft SMP includes the following:

- An Engineering and Institutional Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
    - Engineering Controls:
        - SSDS discussed in Section 4.1.1

        - Cover System discussed in Section 4.1.2
        - Long-Term Groundwater Monitoring Plan discussed in 4.1.3
    - Institutional Controls: Environmental Easement discussed in Section 4.2
- An EWP that details the provisions for management of future excavations in areas of remaining contamination.
- Descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- Provisions for the management and inspection of the identified engineering controls;
- Provisions for maintaining site access controls and NYSDEC notification; and
- The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

5.0 RAOC #3 FINAL REMEDY – COVER SYSTEM

This section details the remedial actions to be performed in addition to the ICs and ECs listed in Section 4.0.

5.1 *Site-Wide Cover System*

The cover system for the Site predominantly consists of existing site features. Specifically, the cover system includes the building on 1500 Jefferson Road, the building on 55 Hofstra Road, the asphalt driveway and parking areas on both parcels, concrete sidewalks on both parcels, and existing surface soils on both parcels. However, as previously noted, two areas of existing surface soils do not meet the requirements for cover at the Site.

- Surface Soils at SS-2 - The surface soil in the location of SS-2 (located at 1500 Jefferson Road) had concentrations of Benzo(a)pyrene at 2.59 and 2.19 ppm, which exceeded the restricted industrial SCO of 1.1 ppm.

- Surface Soils at C-1, C-2 and C-3 – Surface soils in the location of C-1, C-2 and C-3 (located at 55 Hofstra Road) had concentrations of SVOCs that exceeded the restricted commercial SCOs.

Section 5.2 details the work proposed to address the 1500 Jefferson Road surface soils (SS-2) and Section 5.3 details the work proposed to address the 55 Hofstra Road surface soil (C-1, C-2 and C-3). Section 5.4 through 5.5 details work common to both areas.

5.1.1 1500 Jefferson Road Impacted Surface Soils

The surface soils surrounding SS-2 will be removed to 1-ft bgs and backfilled with clean imported topsoil that has been approved by the NYSDEC. This location borders existing cover materials (building, sidewalks, and pavement) and excavation will extend to the existing cover in all directions (refer to Figure 3). Due to the presence of cover materials in all directions, confirmatory soil samples will not be collected. The impacted soils will then be moved to the northeast grassy portion of 55 Hofstra Road and covered with imported materials (approved by NYSDEC). Section 5.2 details the cover system construction for the 55 Hofstra Road Parcel.

Due to the existing tree and shrubbery in this area, it is anticipated the soils will be removed via vacuum truck in order to minimize the potential for damage to the root system. In the event that this is not feasible at the time of the work, the tree and/or shrubbery may be removed. Confirmation of 1-ft. of cover will be achieved by placing grade stakes (approximately 4) throughout the area after the soil has been removed

and prior to placing cover. Marks at 1-ft. will be placed on the grade stakes and backfilling will then continue until 1-ft. of cover is achieved.

5.1.2 55 Hofstra Road Impacted Surface Soils

The area shown on Figure 4 illustrates the area of surface soils on the 55 Hofstra Road parcel that will receive cover materials. Based on the existing vegetation, uneven grades, and constraints in this area the following work will be completed in the order shown:

1) Clearing – Initially the vegetation within the area of the cover system will be removed in order to allow for placement of the cover system. Specifically, all trees will be cut down and removed and disposed of off-site or sent off-site for reuse (e.g., wood chips/mulch). The stumps will be ground and the stump grindings will be left on-site and placed beneath the cover system.

2) Rough Grading – This area of the 55 Hofstra Road parcel has uneven grades and several mounded areas. In order to promote positive drainage from the site, the area will be roughly graded. In general, the area will be 'crowned' such that drainage is promoted back towards catch basins within the 55 Hofstra Road parcel or to the north towards the road and associated roadside ditch or to the east towards the creek that is adjacent to the Site.

3) Cover Placement – 1-ft. of crushed gravel (e.g., #2 stone) will be placed over the area shown on Figure 4. The material will be approved by NYSDEC prior to import (refer to Section 5.2). It should be noted that the cover system is planned to be installed to the following site constraints:

    a. North – An existing fence is located along the northern portion of the Site approximately 20-ft. from the property line. North of this area does not contain mounds/piles with asphalt and the area is a roadside drainage ditch. As such, this area is outside the area of prior soil/asphalt placement, and it is proposed that the cover system extend to the fence line.
    b. East – A stream is located along the eastern edge of the 55 Hofstra Road property. The area of asphalt/soil mounds that are the likely source of SVOCs in surface soils do not extend to the stream bank. It is proposed that the cover system extend up to 5-ft. of the stream bank in order to minimize potential disturbances to the stream bank and stream.
    c. South – The cover system will extend to the property line.
    d. West – The cover system will extend to the asphalt parking lot located on 55 Hofstra Road.

Prior to placing the cover material, grade stakes will be placed throughout the area of the cover system in order to confirm that the cover layer is a minimum of 1-ft. thick. The grade stakes will be monitored throughout the cover placement and photos of the grade stakes will be included in the final engineering report. Grade stakes will be placed in an approximate 50-ft. grid throughout the area.

5.2 *Imported Materials*

A NYSDEC Request to Reuse Fill or Soil form will be completed and provided to the NYSDEC for approval prior to importation and placement of all imported backfill material including topsoil.

Imported backfill material may not be sampled if it meets the exempt requirements in accordance with DER-10 Section 5.4(e)5.

Imported backfill material that does not meet the exemption requirement will be sampled in accordance DER-10 Table 5.4(e)10. In addition, the imported material will also be analyzed for 1,4-dioxane and polyfluorinated compounds (PFCs) as outlined below:

a. Soil imported to a site for use in a soil cap, soil cover, or as backfill must be tested for 1,4-dioxane and PFAS contamination in general conformance with DER-10, Section 5.4(e). Soil samples must be analyzed for 1,4-dioxane using EPA Method 8270, as well as the full list of PFAS compounds (currently 21) using EPA Method 537.1 (modified).
b. For 1,4-dioxane, soil exceeding 0.1 parts per million (ppm) shall be rejected per DER 10: Appendix 5 - Allowable Constituent Levels for Imported Fill or Soil, Subdivision 5.4(e).
c. If PFOA or PFOS is detected in any sample at or above 1 parts per billion (ppb), then a soil sample must be tested by the Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed. If the SPLP results exceed 10 parts per trillion (ppt) for either a PFOA or PFOS, then the source of backfill shall be rejected. Category B deliverables are required for PFAS analysis.

The testing results must meet DER-10 Appendix 5 Allowable Constituent Levels for Imported Fill or Soil Subdivision 5.4(e) Restricted Residential Use. Alternatively, LaBella may request a waiver from the above imported material testing requirements if commercially available bagged topsoil is utilized (which is consistent with prior projects).

5.3 *Demarcation Layer*

Prior to placement of the final cover system for both areas, a demarcation layer will be placed. The demarcation layer will consist of orange snow fence or a mirafi fabric. In the event an alternate material is proposed a request for approval by NYSDEC will be made prior to installation.

5.4 *Health and Safety and Community Air Monitoring*

LaBella's Health and Safety Plan (HASP) for this project is included in Appendix 1. The NYSDOH Generic Community Air Monitoring Plan (CAMP) and Fugitive Dust and Particulate Monitoring will be utilized for this RAWP and is included in Appendix 2.

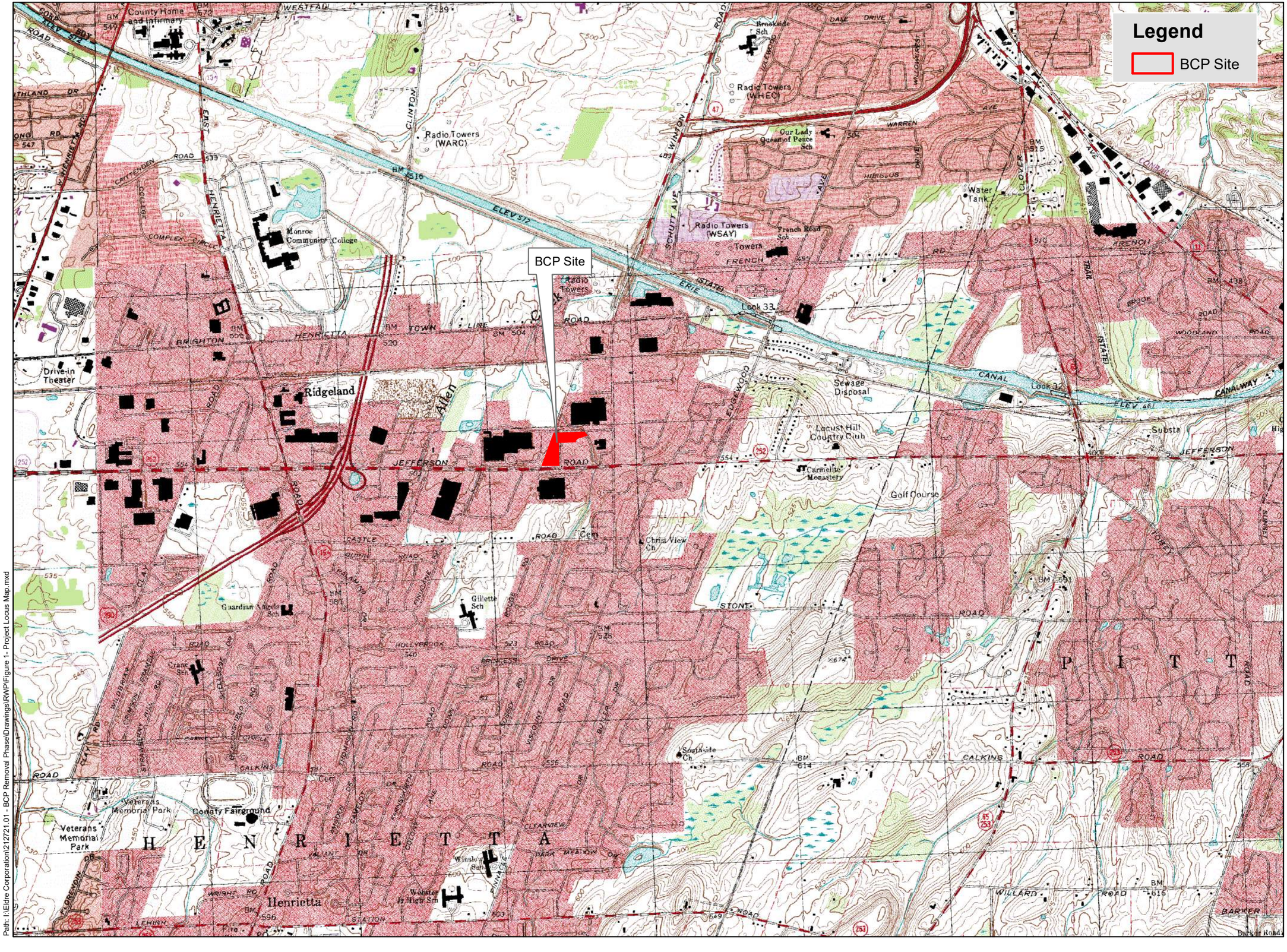
5.5 *Quality Assurance/Quality Control Plan*

Activities completed at the Site will be managed under LaBella's Quality Control Program, which is included in Appendix 3.

6.0 SCHEDULE & DELIVERABLES

Subsequent to completing the cover system installation, the work completed will be documented in as-built drawings of the entire site-wide cover system (including documenting areas of existing cover and the newly constructed cover system areas). The as-built drawings, community air monitoring data and other information will be provided in the Final Engineering Report (FER). At this time, it is expected that the cover system installation will require approximately 6-8 weeks to complete after NYSDEC approval of the RAWP and the FER is anticipated to be submitted approximately 45-days after completing the cover system construction.

FIGURES



LaBella
Powered by partnership.

ELDRE CORPORATION
BCP SITE C828182

1500 JEFFERSON ROAD
AND 55 HOFSTRA ROAD

REMEDIAL ACTION
WORK PLAN

Project Locus Map

N
W E
S

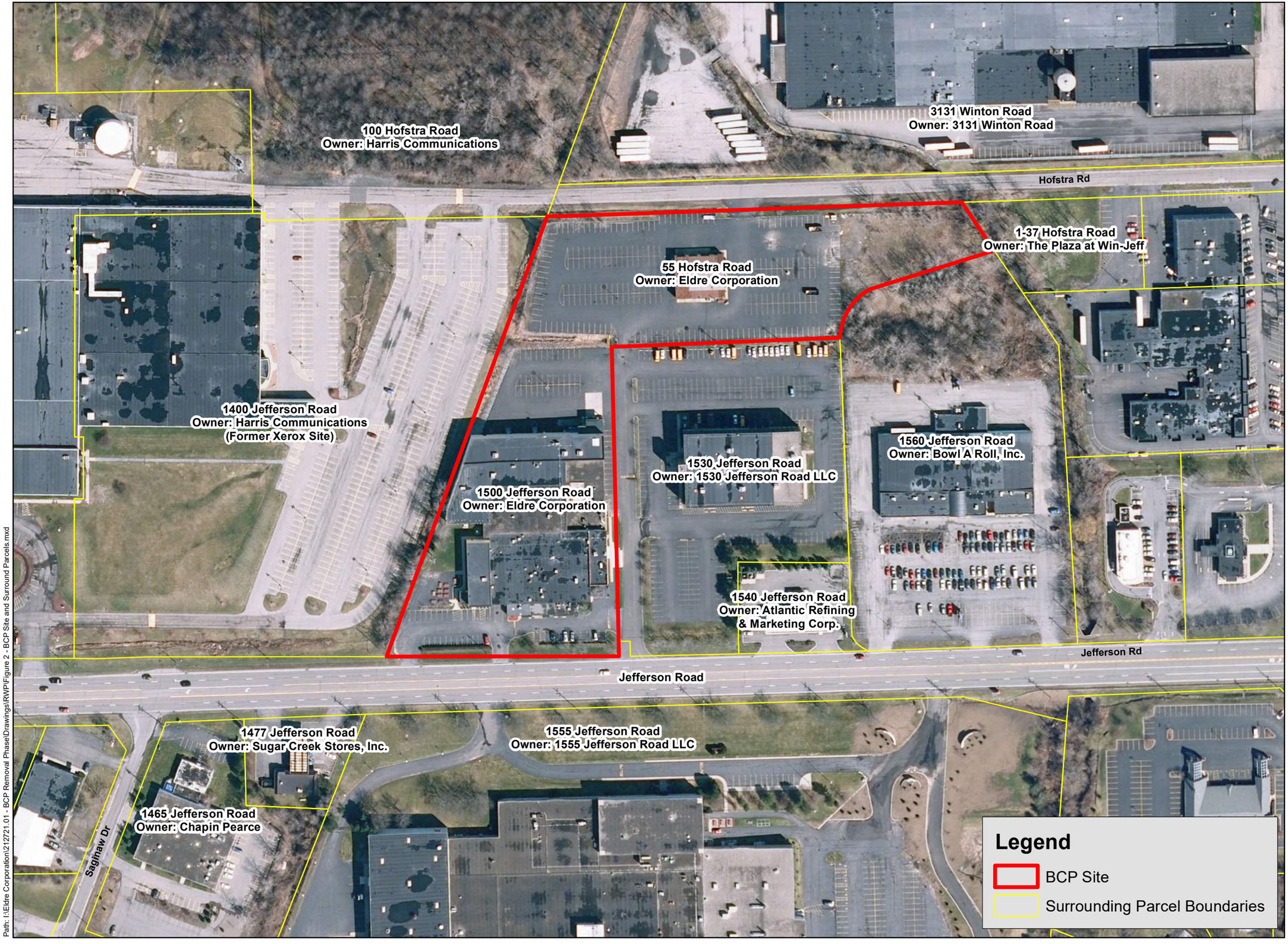
0 2,000 Feet

1 inch = 2,000 feet

212721.01

FIGURE 1

Path: I:\Eldre Corporation\212721.01 - BCP Removal Phase\Drawings\RWP\Figure 1 - Project Locus Map.mxd



Path: I:\Eldre Corporation\212721.01 - BCP Removal Phase\Drawings\RWP\Figure 2 - BCP Site and Surround Parcels.mxd

LaBella
Powered by partnership.

ELDRE CORPORATION
BCP SITE C828182

1500 JEFFERSON ROAD
AND 55 HOFSTRA ROAD

REMEDIAL ACTION
WORK PLAN

BCP Site and
Surrounding Parcels

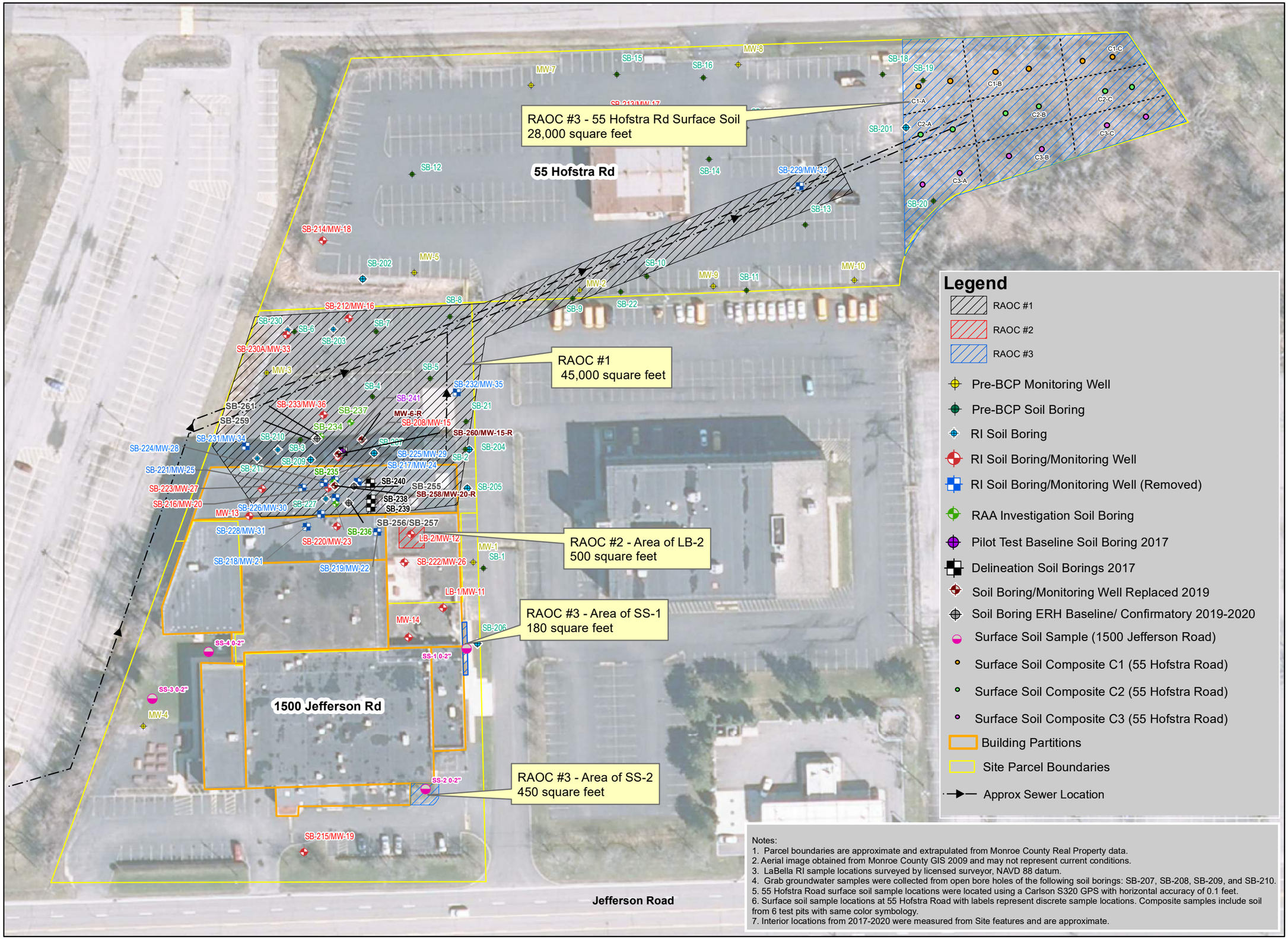
N
W E
S

0 75 150 Feet

1 inch = 150 feet

212721.01

FIGURE 2



Legend

- RAOC #1
- RAOC #2
- RAOC #3
- Pre-BCP Monitoring Well
- Pre-BCP Soil Boring
- RI Soil Boring
- RI Soil Boring/Monitoring Well
- RI Soil Boring/Monitoring Well (Removed)
- RAA Investigation Soil Boring
- Pilot Test Baseline Soil Boring 2017
- Delineation Soil Borings 2017
- Soil Boring/Monitoring Well Replaced 2019
- Soil Boring ERH Baseline/ Confirmatory 2019-2020
- Surface Soil Sample (1500 Jefferson Road)
- Surface Soil Composite C1 (55 Hofstra Road)
- Surface Soil Composite C2 (55 Hofstra Road)
- Surface Soil Composite C3 (55 Hofstra Road)
- Building Partitions
- Site Parcel Boundaries
- Approx Sewer Location

Notes:
1. Parcel boundaries are approximate and extrapulated from Monroe County Real Property data.
2. Aerial image obtained from Monroe County GIS 2009 and may not represent current conditions.
3. LaBella RI sample locations surveyed by licensed surveyor, NAVD 88 datum.
4. Grab groundwater samples were collected from open bore holes of the following soil borings: SB-207, SB-208, SB-209, and SB-210.
5. 55 Hofstra Road surface soil sample locations were located using a Carlson S320 GPS with horizontal accuracy of 0.1 feet.
6. Surface soil sample locations at 55 Hofstra Road with labels represent discrete sample locations. Composite samples include soil from 6 test pits with same color symbology.
7. Interior locations from 2017-2020 were measured from Site features and are approximate.

LaBella
Powered by partnership.

ELDRE CORPORATION
BCP SITE C828182

1500 JEFFERSON ROAD
AND 55 HOFSTRA ROAD

REMEDIAL ACTION
WORK PLAN

REMEDIAL AREAS OF
CONCERN (RAOCs)

N
W E
S

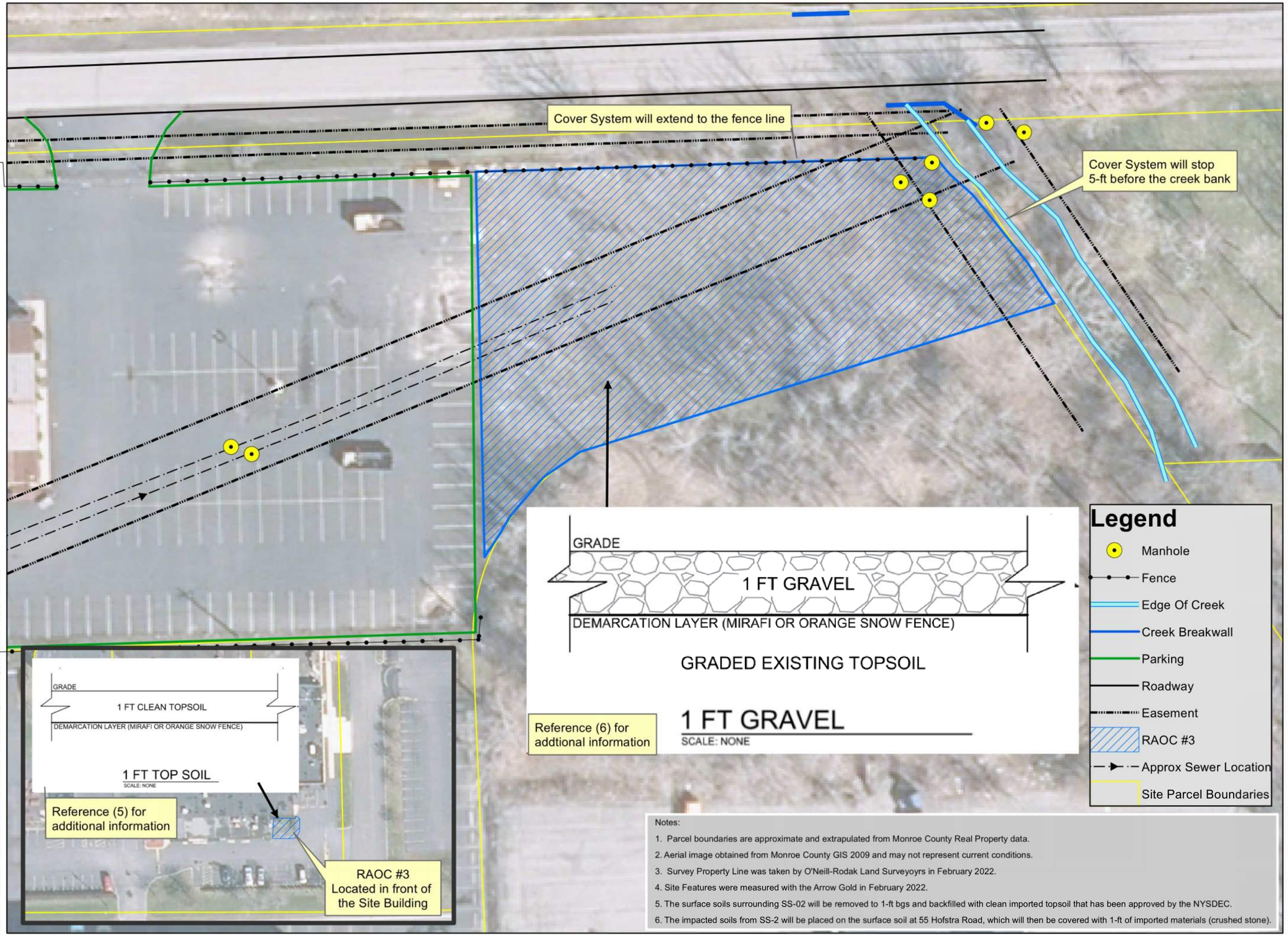
0 40 80
Feet

1 inch = 80 feet
Intended to print as 11" x 17".

212721.01

FIGURE 3

Path: I:\Eldre Corporation\212721.01 - BCP Removal Phase\Drawings\RWP\Figure 3 - Remedial Areas of Concern (RAOCs).mxd



Notes:

1. Parcel boundaries are approximate and extrapulated from Monroe County Real Property data.
2. Aerial image obtained from Monroe County GIS 2009 and may not represent current conditions.
3. Survey Property Line was taken by O'Neill-Rodak Land Surveyoyrs in February 2022.
4. Site Features were measured with the Arrow Gold in February 2022.
5. The surface soils surrounding SS-02 will be removed to 1-ft bgs and backfilled with clean imported topsoil that has been approved by the NYSDEC.
6. The impacted soils from SS-2 will be placed on the surface soil at 55 Hofstra Road, which will then be covered with 1-ft of imported materials (crushed stone).

LaBella
Powered by partnership.

ELDRE CORPORATION
BCP SITE C828182

1500 JEFFERSON ROAD
AND 55 HOFSTRA ROAD

REMEDIAL ACTION
WORK PLAN

FINAL REMEDY

N
W E
S

1 inch = 40 feet
Intended to print as 11" x 17".

212721.01

FIGURE 4

Path: I:\Eldre Corporation\212721.01 - BCP Removal Phase\Drawings\RWP\Figure 4 RAOC 3 Cover cap.mxd

APPENDIX 1

Health and Safety Plan

Site Health and Safety Plan

Location:

1500 Jefferson Road & 55 Hofstra Road
Town of Henrietta
Monroe County, New York

Prepared For:

Mr. Harvey Erdle
16622 Sweet Bay Drive
Delray Beach, FL 33445
&
Alex Kralles
Mersen USA Rochester-NY, Corp.
1500 Jefferson Road
Rochester, NY 14623

LaBella Project No. 212721.01

July 2020

Table of Contents

Page

SITE HEALTH AND SAFETY PLAN

Project Title:	Eldre Corporation
Project Number:	212721.02
Project Location (Site):	1500 Jefferson Road & 55 Hofstra Road, Henrietta New York
Project Manager:	Dan Noll, PE
Site Safety Supervisor:	To Be Determined
Site Contact:	Alex Kralles, Mersen
Safety Director:	David Engert, CHMM
Proposed Date(s) of Field Activities:	To Be Determined
Site Conditions:	Industrial and commercial property comprising 6.72-acres with active manufacturing. Site slopes from south to north.
Site Environmental Information Provided By:	Phase I ESA and Phase II ESA by LaBella. Draft Remedial Investigation Report by LaBella. Interim Remedial Measures Work Plan for RAOC #1 by LaBella.
Air Monitoring Provided By:	LaBella Associates, DPC
Site Control Provided By:	LaBella Associates, DPC

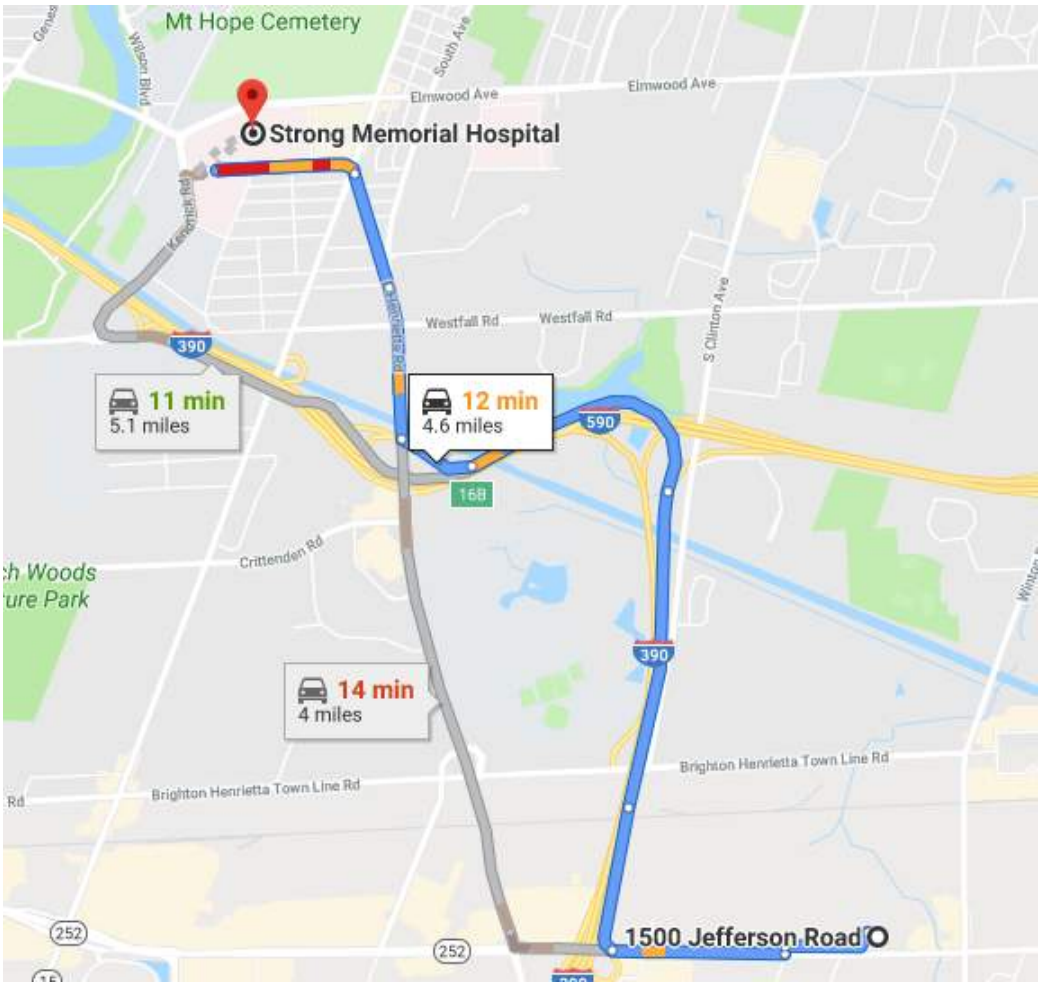
EMERGENCY CONTACTS

	Name	Phone Number
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Strong Memorial Hospital	(585) 275-2100
Poison Control Center:	Finger Lakes Poison Control	716-275-5151
Police (local, state):	Monroe County Sheriff	911
Fire Department:	Henrietta Fire District	911
Site Contact:	Alex Kralles, Mersen	585-784-2501
Agency Contact:	NYSDEC – Charlotte Theobald NYSDOH – Julia Kenney	585-226-5354 518-402-7860
Project Manager:	Dan Noll, PE	585-301-8458
Safety Director	David Engert, CHMM	585-295-6630

MAP AND DIRECTIONS TO THE MEDICAL FACILITY
STRONG MEMORIAL HOSPITAL

Total Est. Time: 12 minutes **Total Est. Distance:** 4.6 miles

1:	Turn right onto Jefferson Road	0.3 miles
2:	Merge onto I-390 N via ramp on the right to Crittenden Blvd	3.9 miles
3:	Slight left onto Crittenden Blvd	0.4 miles
4:	End at Strong Memorial Hospital Rochester, NY 14642	



1.0 Introduction

The purpose of this Health and Safety Plan (HASP) it to provide guidelines for responding to potential health and safety issues that may be encountered during subsurface work at 1500 Jefferson Road and 55 Hofstra Road, located in the Town of Henrietta, Monroe County, New York, New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) Site #C828182 (the Site). This HASP only reflects the policies of LaBella Associates D.P.C. The requirements of this HASP are applicable to LaBella personnel at the work site. It is the responsibility of each sub-consultant and sub-contractor to follow their own company HASP. This document's project specifications should be consulted for guidance in preventing and quickly abating any threat to human safety or the environment. The provisions of the HASP were developed in general accordance with 29 CFR 1910 and 29 CFR 1926 and do not replace or supersede any regulatory requirements of the USEPA, NYSDEC, OSHA or and other regulatory body.

2.0 Responsibilities

This HASP presents guidelines to minimize the risk of injury to project personnel, and to provide rapid response in the event of injury. The HASP is applicable only to activities of approved LaBella personnel. It is the responsibility of LaBella employees to follow the requirements of this HASP, or HASPs specific to individual activities, and all applicable company safety procedures.

3.0 Activities Covered

The activities covered under this HASP are limited to the following:

- Collection of soil and groundwater samples
- Subsurface excavation work

4.0 Work Area Access and Site Control

LaBella will have primary responsibility for maintaining a safe work area for all activities conducted by LaBella personnel. Such work area controls will consist of:

- Air monitoring.
- Use of Personal Protective Equipment (PPE).

5.0 Potential Health and Safety Hazards

This section lists some potential health and safety hazards that project personnel may encounter at the project site and some actions to be implemented by approved personnel to control and reduce the associated risk to health and safety. This is not intended to be a complete listing of any and all potential health and safety hazards. New or different hazards may be encountered as site environmental and site work conditions change. The suggested actions to be taken under this plan are not to be substituted for good judgment on the part of project personnel. At all times, the Site Safety Officer has responsibility for site safety and his instructions must be followed.

5.1 Hazards Due to Heavy Machinery and Equipment

Potential Hazard:

Heavy machinery including trucks, drilling rigs, trailers, etc. will be in operation at the site. The presence of such equipment presents the danger of being struck or crushed. Use caution when working near heavy machinery.

Protective Action:
Make sure that operators are aware of your activities, and heed operator's instructions and warnings. Wear bright colored clothing and walk safe distances from heavy equipment. A hard hat, safety glasses and steel toe shoes are required.

5.2 Excavation Hazards

Potential Hazard:
Excavations and trenches can collapse, causing injury or death. Edges of excavations can be unstable and collapse. Toxic and asphyxiant gases can accumulate in confined spaces and trenches. Excavations that require working within the excavation will require air monitoring in the breathing zone (refer to Section 9.0). Excavations left open create a fall hazard which can cause injury or death.

Protective Action:
Personnel must receive approval from the Project Manager to enter an excavation for any reason. Subsequently, approved personnel are to receive authorization for entry from the Site Safety Officer. Approved personnel are not to enter excavations over 4 feet in depth unless excavations are adequately sloped. Additional personal protective equipment may be required based on the air monitoring.

Personnel should exercise caution near all excavations at the site as it is expected that excavation sidewalls will be unstable. Do not proceed closer than 3 feet to an unsupported or non-sloped excavation side wall.

Fencing and/or barriers accompanied by "no trespassing" signs should be placed around all excavations when left open for any period of time when work is not being conducted.

5.3 Cuts, Punctures and Other Injuries

Potential Hazard:
In any excavation or construction work site there is the potential for the presence of sharp or jagged edges on rock, metal materials, and other sharp objects. Serious cuts and punctures can result in loss of blood and infection.

Protective Action:
The Project Manager is responsible for making First Aid supplies available at the work site to treat minor injuries. The Safety Director is responsible for arranging the transportation of authorized on-site personnel to medical facilities when First Aid treatment in not sufficient. Do not move seriously injured workers. All injuries requiring treatment are to be reported to the Project Manager. Serious injuries are to be reported immediately to the Safety Director.

5.4 Injury Due to Exposure of Chemical Hazards

Potential Hazards:
Contaminants identified in testing locations at the Site include various volatile organic compounds (VOCs), primarily chlorinated VOCs. Volatile organic vapors, chlorinated solvents

or other chemicals may be encountered during subsurface activities at the project work site. Inhalation of high concentrations of volatile organic vapors can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis.

Protective Action:
The presence of organic vapors may be detected by their odor and by monitoring instrumentation. Unauthorized personnel will not be in the vicinity of the work area during subsurface work. Subsurface work will be conducted after normal facility working hours.

Air monitoring will be performed in accordance with the Site-specific CAMP. Personnel are to leave the work area whenever PID measurements of ambient air exceed 25 ppm consistently for a 5 minute period. In the event that sustained total volatile organic compound (VOC) readings of 25 ppm is encountered personnel should upgrade personal protective equipment to Level C (refer to Section 8.0) and an Exclusion Zone should be established around the work area to limit and monitor access to this area (refer to Section 6.0).

5.5 Injuries Due to Extreme Hot or Cold Weather Conditions

Potential Hazards:
Extreme hot weather conditions can cause heat exhaustion, heat stress and heat stroke or extreme cold weather conditions can cause hypothermia.

Protective Action:
Precaution measures should be taken such as dress appropriately for the weather conditions and drink plenty of fluid. If personnel should suffer from any of the above conditions, proper techniques should be taken to cool down or heat up the body and taken to the nearest hospital if needed.

5.6 Temperature Hazards

Potential Hazards:
The ground and any equipment in the ground will be heated up to 100 degrees Celsius. Possible hazards include burn hazards.

Protective Action:
Sampling of subsurface materials will be completed in accordance with the Hot Soil and Groundwater Sampling Standard Operating Procedures included in the Interim Remedial Measures Work Plan. Appropriate heat resistance gloves shall be worn by sampling personnel.

6.0 Work Zones

In the event that conditions warrant establishing various work zones (i.e., based on hazards - Section 5.4), the following work zones should be established:

Exclusion Zone (EZ):
The EZ will be established in the immediate vicinity and adjacent downwind direction of site activities that elevate breathing zone VOC concentrations to unacceptable levels based on field screening. These site activities include contaminated soil excavation and soil sampling

activities. If access to the site is required to accommodate non-project related personnel then an EZ will be established by constructing a barrier around the work area (yellow caution tape and/or construction fencing). The EZ barrier shall encompass the work area and any equipment staging/soil staging areas necessary to perform the associated work. The contractor(s) will be responsible for establishing the EZ and limiting access to approved personnel. LaBella will not enter the EZ unless deemed necessary to do so. Depending on the condition for establishing the EZ, access to the EZ may require adequate PPE (e.g., Level C).

Contaminant Reduction Zone (CRZ):
The CRZ will be the area where personnel entering the EZ will don proper PPE prior to entering the EZ and the area where PPE may be removed. The CRZ will also be the area where decontamination of equipment and personnel will be conducted as necessary.

7.0 Decontamination Procedures

Upon leaving the work area, approved personnel shall decontaminate footwear as needed. Under normal work conditions, detailed personal decontamination procedures will not be necessary. Work clothing may become contaminated in the event of an unexpected splash or spill or contact with a contaminated substance. Minor splashes on clothing and footwear can be rinsed with clean water. Heavily contaminated clothing should be removed if it cannot be rinsed with water. Personnel assigned to this project should be prepared with a change of clothing whenever on site.

8.0 Personal Protective Equipment

Generally, site conditions at this work site require level of protection of Level D or modified Level D. However, air monitoring will be conducted to determine if up-grading to Level C PPE is required (refer to Section 9.0). Descriptions of the typical safety equipment associated with Level D and Level C are provided below:

Level D:
Hard hat, safety glasses, rubber nitrile sampling gloves, steel toe construction grade boots, etc.

Level C:
Level D PPE and full or ½-face respirator and tyvek suit (if necessary). [*Note: Organic vapor cartridges are to be changed after each 8-hours of use or more frequently.*]

9.0 Air Monitoring

According to 29 CFR 1910.120(h), air monitoring shall be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection required for personnel working onsite. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications. Refer to the Site-specific CAMP for air monitoring requirements.

10.0 Emergency Action Plan

In the event of an emergency, employees are to turn off and shut down all powered equipment and leave the work areas immediately. Employees are to walk or drive out of the Site as quickly as

possible and wait at the assigned 'safe area'. Follow the instructions of the Site Safety Officer.

Employees are not authorized or trained to provide rescue and medical efforts. Rescue and medical efforts will be provided by local authorities.

11.0 Medical Surveillance

Medical surveillance will be provided to all employees who are injured due to overexposure from an emergency incident involving hazardous substances at this site.

12.0 Employee Training

Personnel who are not familiar with this site plan will receive training on its entire content and organization before working at the Site.

Individuals involved with the fieldwork must be 40-hour OSHA HAZWOPER trained with current 8-hour refresher certification.

I:\ELDRE CORPORATION\212721.01 - BCP REMOVAL PHASE\REPORTS\SMP\8 - HASP\HASP.DOC

Table 1
Exposure Limits and Recognition Qualities

Compound	PEL-TWA (ppm)(b)(d)	TLV-TWA (ppm)(c)(d)	STEL	LEL (%)(e)	UEL (%)(f)	IDLH (ppm)(g)(d)	Odor	Odor Threshold (ppm)	Ionization Potential
Acetone	750	500	NA	2.15	13.2	20,000	Sweet	4.58	9.69
Anthracene	0.2	0.2	NA	NA	NA	NA	Faint aromatic	NA	NA
Benzene	1	0.5	5	1.3	7.9	3000	Pleasant	8.65	9.24
Benzo (a) pyrene (coal tar pitch volatiles)	0.2	0.1	NA	NA	NA	700	NA	NA	NA
Benzo (a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (b) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (k) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	10.88
Carbon Disulfide	20	1	NA	1.3	50	500	Odorless or strong garlic type	0.096	10.07
Chlorobenzene	75	10	NA	1.3	9.6	2,400	Faint almond	0.741	9.07
Chloroform	50	2	NA	NA	NA	1,000	ethereal odor	11.7	11.42
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethylene	200	200	NA	9.7	12.8	400	Acrid	NA	9.65
1,2-Dichlorobenzene	50	25	NA	2.2	9.2		Pleasant		9.07
Ethylbenzene	100	100	NA	1	6.7	2,000	Ether	2.3	8.76
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	NA	NA	NA	5	15	NA	NA	NA	12.98
Methylene Chloride	500	50	NA	12	23	5,000	Chloroform-like	10.2	11.35
Naphthalene	10, Skin	10	NA	0.9	5.9	250	Moth Balls	0.3	8.12
n-propylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethane	NA	NA	NA	NA	NA	NA	Sweet	NA	NA
Toluene	100	100	NA	0.9	9.5	2,000	Sweet	2.1	8.82
Trichloroethylene	100	50	NA	8	12.5	1,000	Chloroform	1.36	9.45
1,2,4-Trimethylbenzene	NA	25	NA	0.9	6.4	NA	Distinct	2.4	NA
1,3,5-Trimethylbenzene	NA	25	NA	NA	NA	NA	Distinct	2.4	NA
Vinyl Chloride	1	1	NA	NA	NA	NA	NA	NA	NA
Xylenes (o,m,p)	100	100	NA	1	7	1,000	Sweet	1.1	8.56
Metals									
Arsenic	0.01	0.2	NA	NA	NA	100, Ca	Almond	NA	NA
Cadmium	0.2	0.5	NA	NA	NA	NA	NA	NA	NA
Chromium	1	0.5	NA	NA	NA	NA	NA	NA	NA
Lead	0.05	0.15	NA	NA	NA	700	NA	NA	NA
Mercury	0.05	0.05	NA	NA	NA	28	Odorless	NA	NA
Selenium	0.2	0.02	NA	NA	NA	Unknown	NA	NA	NA
Other									
Asbestos	0.1 (f/cc)	NA	1.0 (f/cc)	NA	NA	NA	NA	NA	NA

(a) Skin = Skin Absorption

(b) OSHA-PEL Permissible Exposure Limit (flame weighted average, 8-hour): NIOSH Guide, June 1990

(c) ACGIH – 8 hour time weighted average from Threshold Limit Values and Biological Exposure Indices for 2003

(d) Metal compounds in mg/m3

(e) Lower Exposure Limit (%)

(f) Upper Exposure Limit (%)

(g) mmediately Dangerous to Life or Health Level: NIOSH Guide, June 1990

Notes:

1. All values are given in parts per million (PPM) unless otherwise indicated
2. Ca = Possible Human Carcinogen, no IDLH information

APPENDIX 2

Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

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

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

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

December 2009

APPENDIX 3

Quality Control Plan

Quality Control Program (QCP)

Site Location:

Eldre Corporation
1500 Jefferson Road & 55 Hofstra Road
Town of Henrietta
Monroe County, New York

July 2020

300 State Street, Suite 201 | Rochester, NY 14614 | p 585-454-6110 | f 585-454-3066
www.labellapc.com

Table of Contents

Table of Contents (continued)

1.0 Introduction

LaBella's Quality Control Program (QCP) is an integral part of its approach to environmental investigations. By maintaining a rigorous QC program, our firm is able to provide accurate and reliable data. This QCP should be followed during implementation of environmental investigation and remediation projects and should serve as a basis for quality control methods to be implemented during field programs. Project-specific requirements may apply.

The QC program contains procedures which allow for the proper collection and evaluation of data and documents that QC procedures have been followed during field investigations. The QC program presents the methodology and measurement procedures used in collecting quality field data. This methodology includes the proper use of equipment, documentation of sample collection, and sample handling procedures.

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

This QC program includes the following:

- QC Objectives and Checks
- Field Equipment, Handling, and Calibration
- Sampling and Logging Techniques
- Sample Handling, Packaging, and Shipping
- Laboratory Requirements and Deliverables

It should be noted that project-specific work plans (e.g., Remedial Investigation Work Plans) may have project specific details that will differ from the procedures in this QC program. In such cases, the project-specific work plan should be followed (subsequent to regulatory approval).

The characteristics of major importance for the assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. Application of these characteristics to specific projects is addressed later in this document. The characteristics are defined below.

1.1 Accuracy

Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

1.2 Precision

Precision is the degree of mutual agreement among individual measurements of a given parameter.

1.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

1.4 Representativeness

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition

Careful choice and use of appropriate methods in the field will ensure that samples are representative. This is relatively easy with water or air samples since these components are homogeneously dispersed. In soil and sediment, contaminants are unlikely to be evenly distributed, and thus it is important for the sampler and analyst to exercise good judgment when removing a sample.

1.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. The data sets may be inter- or intra- laboratory.

2.0 Measurement of Data Quality

2.1 Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" take the form of EPA standard reference materials, or laboratory prepared solutions of target analytes spiked into a pure water or sample matrix. In the case of gas chromatography (GC) or GC/MS (mass spectrometry) analyses, solutions of surrogate compounds are used. These solutions can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination.

In each case the recovery of the analyte is measured as a percentage, correcting for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA supplied known solutions, this recovery is compared to the published data that accompany the solution.

For the firm's prepared solutions, the recovery is compared to EPA-developed data or the firm’s historical data as available. For surrogate compounds, recoveries are compared to EPA CLP acceptable recovery tables.

If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate. The analyst or his supervisor must initiate an investigation of the cause of the problem and take corrective action. This can include recalibration of the instrument, reanalysis of the QC sample, reanalysis of

the samples in the batch, or flagging the data as suspect if the problems cannot be resolved. For highly contaminated samples, recovery of the matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

2.2 Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is typically not known to the laboratory. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantitation of precision is impossible. For EPA CLP analyses, replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD).

- Where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses.
- RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non-homogeneity, analysis of check samples, etc. Follow-up action may include sample reanalysis or flagging of the data as suspect if problems cannot be resolved.
- During the data review and validation process, field duplicate RPDs are assessed as a measure of the total variability of both field sampling and laboratory analysis.

2.3 Completeness

Completeness for each parameter is calculated as follows:

- The firm's target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the site managers. In planning the field sample collection, the site manager will plan to collect field duplicates from identified critical areas. This procedure should assure 100% completeness for these areas.

2.4 Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the site and the specific area. Within the laboratory, precautions are taken to extract from the sample bottle an aliquot representative of the whole sample. This includes premixing the sample and discarding pebbles from soil samples.

2.5 Comparability

Comparability of laboratory tests is ensured by utilizing only New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)- certified laboratories. This certification is the basis for demonstrating proficiency in testing requirements. Using ELAP certified laboratories will result in consistency amongst analytical data within a specific project and across projects.

3.0 Quality Control Targets

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and RPD of duplicates/replicates are included in the QCP, Analytical Procedures. Note that tabulated values are not always attainable. Instances may arise where high sample concentrations, non-homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the firm will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

4.0 Soil Boring Advancement & Monitoring Well Installation Procedures

Soil and groundwater sampling shall be conducted in accordance with NYSDEC Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation dated May 3, 2010 and any Site-specific work plans.

Prior to drilling, all drill sites will be cleared with appropriate utility companies to avoid potential accidents relating to underground utilities. Utility drawings will be reviewed, if available.

4.1 Drilling Equipment and Techniques

Direct Push Geoprobe Advanced Borings:

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

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

Test borings will be advanced with 2-inch (or larger) inside diameter (ID) direct push Macrocore through overburden soils. Drilling fluids, other than potable water will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

During the drilling, a properly calibrated photoionization detector (PID) will be used to screen soil cores retrieved from the Macrocores.

Direct Push Geoprobe advanced groundwater-monitoring wells typically utilize minimum 1.25-inch threaded flush joint PVC pipe with 0.010-in. slotted screen or pre-packed well screens. PVC piping used for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe.. All materials used to construct the wells will be NSF/ASTM approved. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well. Stainless steel wells or pre-packed PVC wells may be used if specified in the work plan and approved by the NYSDEC.

Hollow-Stem Auger Advanced Borings:

The drilling and installation of soil borings and monitoring wells will be performed using a rotary drill rig which will have sufficient capacity to perform 4 1/4-inch inside diameter (ID) hollow-stem auger drilling in the overburden, retrieve Macrocore or split-spoon samples, and perform necessary rock coring using NX, NQ, HQ or core barrel size as specified in the project-specific work plan. The borehole may be reamed up to 5 1/2-inch diameter prior to monitoring well installation as cased hole in the bedrock, or may be left as open bedrock hole, with regulatory concurrence. Equipment sizes and diameters may vary based on project-specific criteria. Any investigative derived waste generated during the advancement of soil borings and monitoring well installations will be containerized and characterized for proper disposal.

Prior to initiating drilling activities, the augers, rods, Macrocore, split spoons, and other pertinent equipment will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Steam cleaning activities will be performed in a designated on-site decontamination area. During and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used.
Test borings will be advanced with 4 1/4-inch (ID) hollow stem augers through overburden, and cored with a NX, NQ, HQ or core barrel size as specified in the project-specific work plan sized diamond core barrels in competent rock, driven by truck-, track-, or trailer-mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for project-

specific criteria, but must be approved by the NYSDEC. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

During the drilling, a (PID) will be used to screen soils retrieved from the split spoons or Macrocores. In the event that headspace field screening is required to determine the presence of VOCs in soil samples, the following procedure will be utilized:

- Soils from core will be inserted into an airtight glass jar and/or disposable polyethylene bag, and the container will be sealed immediately
- After sealing the container, the soils will be shaken or kneaded for 10-15 seconds to release volatiles into the headspace of the sealed container
- The PID inlet will be inserted into the headspace of the airtight container to screen soil samples for VOCs

During the drilling, visual screening will be utilized to identify any Non-Aqueous Phase Liquid (NAPL) in the soil cores.

Where bedrock wells are required, test borings shall be advanced into rock with NX, NQ, HR (or similar) coring tools. Only water from an approved source shall be used in rock coring. The consultant shall monitor and record the petrology, core recovery, fractures, rate of advance, and water lost or produced in each test boring. The Rock Quality Determination (RQD) value shall be calculated for each 5-foot core. Each core shall be screened with a PID upon extraction. All core samples shall be retained and stored by the consultant in an approved wooden core box for a period of not less than one year.

The method selected may be percussion or rotary drilling. The method and equipment selected must be capable of penetrating the bedrock at each well location to a depth required by the work plan.

Bedrock well installation will involve construction of a rock socket in the weathered bedrock. The socket will be drilled into the top of rock (typically 1-ft. to 5-ft. into the top of rock) at each bedrock well location to allow a permanent steel casing to be grouted securely in place prior to completion of the well. The purpose for this is to provide a seal at the overburden/bedrock interface and into the upper bedrock surface, to prevent the entrance of overburden water into the bedrock. After the grout and casing have set up for a minimum of 12 hours, the remaining bedrock can be NX (or similar) cored through the steel casing to a depth determined by the project-specific work plan.

Bedrock wells will either be open coreholes in the rock or consist of threaded, flush-joint PVC piping. Construction will vary depending on the project and as such, specific construction of the wells will be detailed in the project-specific work plan. Bedrock wells which do utilized PVC piping for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe. All materials used to construct the wells will be NSF/ASTM approved.

Screen and riser sections shall be joined by flush-threaded coupling to form watertight unions that retain 100% of the strength of the casing. Solvent PVC glue shall not be used at any time in the

construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well.

4.1.1 Artificial Sand Pack

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

An artificial sand pack will not be utilized in bedrock wells without screens (i.e., open borehole wells).

4.1.2 Bentonite Seal

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

4.1.3 Grout Mixture

Upon completion of the bentonite seal, the well may be grouted with a non-shrinking cement grout (e.g., Volclay^{R}) mix to be placed from the top of the bentonite seal to the ground surface. The cement grout shall consist of a mixture of Portland cement (ASTM C 150) and water, in the proportion of not more than 7 gallons of clean water per bag of cement (1 cubic foot or 94 pounds). Additionally, 3% by weight of bentonite powder may be added.

4.1.4 Surface Protection

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

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

4.2 Surveying

Coordinates and elevations will be established for each monitoring well and sampling location. Elevations to the closest 0.01 foot shall be used for the survey. These elevations shall be referenced to a regional, local, or project-specific datum. The location, identification, coordinates,

and elevations of the wells will be plotted on maps with a scale large enough to show their location with reference to other structures at each site.

4.3 Well Development

After completion of the well, but not sooner than 24 hours after grouting is completed, development will be accomplished using pumping, bailing, or surge blocking. No dispersing agents, acids, disinfectants, or other additives will be used during development or introduced into the well at any other time. During development, water will be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

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

The development process will continue until removal of a minimum of 110% of the water lost during drilling, three well volumes; whichever is greater, or as specified in the work plan. In the event that limited recharge does not allow for the recovery of all drilling water lost in the well or three (3) well volumes, the well will be allowed to stabilize to conditions deemed representative of groundwater conditions. Stabilization periods will vary by project but will be confirmed with the NYSDEC prior to sampling.

4.4 PFAS Soil Sampling Procedure

Soil samples for PFAS analysis will be collected using PFAS-Free equipment. Samples will be collected in bottleware provided by the laboratory. Because PFAS are found in numerous everyday items, the following special precautions will be taken during sampling activities:

- No use of Teflon®-containing materials (e.g., Teflon® tubing, bailers, tape, sample jar lid liners, plumbing paste).
- No use of low density polyethylene (LDPE)-containing materials.
- No Tyvek® clothing will be worn by samplers.
- Clothes treated with stain-resistant or rain-resistant coatings (e.g., Gortex®) will be not be worn by samplers.
- All clothing worn by sampling personnel must have been laundered multiple times.
- No fast food wrappers, disposable cups or microwave popcorn will be within the vicinity of the wells/ samples.
- There will be no use of chemical (blue) ice packs, aluminum foil, or Sharpies® within the vicinity of the wells/ samples.
- No use of sunscreen, insect repellants, cosmetic, lotions or moisturizers will be allowed by sampling personnel the day of sampling.
- If any of the above items are handled by the field personnel prior to sampling activities, field personnel will wash their hands thoroughly with soap and water prior to any sampling activities.
- Powder-free nitrile gloves will be worn during all sample collection activities.

Quality assurance/ quality control (QA/QC) samples for PFAS sampling will include one (1) field duplicate, one (1) matrix spike / matrix spike duplicates (MS/MSD) and one (1) equipment blank. The procedures and rationale for collecting these samples are described below.

- **Field duplicate** – Sample will be used to assess the variability in concentrations of samples from the same well due to the combined effects of sample processing in the field and laboratory as well as chemical analysis.

- **Matrix spike/matrix spike duplicate** – Sample will be used to provide information about the effect of the sample matrix on the design and measurement methodology used by the laboratory.

- **Equipment blank** – Sample will be collected to help identify possible contamination from sampling equipment (i.e., shovel, soil core, etc.).

PFAS samples will be submitted to an Environmental Laboratory Accreditation Program (ELAP) certified laboratory for analysis of the full PFAS target analyte list (21 compounds listed in the NYSDEC Guidance) via modified USEPA Method 537 with a method detection limit not to exceed 1 ug/kg. Note, the laboratory utilized will be ELAP certified for PFOA and PFOS in drinking water by EPA method 537 or ISO 25101 as ELAP does not currently offer certification for PFAS compounds in matrices other than finished drinking water.

5.0 Geologic Logging and Sampling

At each investigative location, borings will be advanced through overburden using either a drill rig and hollow-stem auger or direct push technology (split spoons or Macrocore). Soils will be evaluated for visual and olfactory evidence of impairment (i.e., staining, odors, and elevated PID readings) by a qualified individual. Sampling devices will be decontaminated according to procedures outlined in the Decontamination section of this document. When utilized, split-spoon samplers will be driven into the soil using a minimum 140-pound safety hammer and allowed to free-fall 30-inches, in accordance with ASTM-D 1586-84 specifications. The number of blows required to drive the sampler each 6-inches of penetration will be recorded. When required, samples will be stored in the appropriate bottleware (refer to Section 10) until analysis or deemed unnecessary.

In the event that maximum design depth of investigation is reached and hydrogeologic conditions are not suitable for well installation, the maximum drilling depth may be revised.

Boulders and bedrock encountered during well installation may be cored by standard diamond-core drilling methods using an NX, NQ, HQ size core barrel or other if specified in the project-specific work plan. All rock cores recovered will be logged by a qualified individual, and stored in labeled wooden core boxes. The cores will be stored by the firm until the project is completed or for at least one year. Drilling logs will be prepared by a qualified individual who will be present during drilling operations. One copy of each field boring and well construction log and groundwater data, will

typically be submitted as part of the investigation summary report (e.g., Remedial Investigation Report). The RQD value shall be calculated for each 5-foot section. Information provided in the logs shall include, but not be limited to, the following:

- Date(s), test hole identification, and project identification;
- Name of individual developing the log;
- Name of driller and assistant(s);
- Drill, make and model, auger size;
- Identification of alternative drilling methods used and justification thereof (e.g., rotary drilling with a specific bit type to remove material from within the hollow stem augers);
- Standard penetration test (ASTM D-1586) blow counts;
- Field diagram of each monitoring well installed with the depth to bottom of well/ screen, top of screen, length of riser, depth of steel casing, depths of sand pack, bentonite seal, grout, type of well completion etc.;
- Depth of each change of stratum;
- Identification of the material of which each stratum is composed, according to the USCS system or standard rock nomenclature, as appropriate;
- Depth interval from which each sample was taken, sample identification, and sample time;
- Depth at which hole diameters (bit sizes) change;
- Depth at which groundwater is encountered;
- Drilling fluid and quantity of water lost during drilling;
- Depth or location of any loss of tools or equipment;
- Depths of any fractures, joints, faults, cavities, or weathered zones

6.0 Groundwater Sampling Procedures

The groundwater in all new monitoring wells will be allowed to stabilize for at least 1week following development prior to sampling. Water levels will be measured to within 0.01 feet prior to purging and sampling. Sampling of each well will typically be accomplished in one of two ways; active or passive.

Active Sampling:

Active sampling includes bailing or pumping. Purging will be completed prior to active sampling if specified in the project-specific work plan. During purging, the following will be recorded in field books or groundwater sampling logs:

- date
- purge start time
- weather conditions
- presence of NAPL, if any, and approximate thickness
- pump rate
- pH
- dissolved oxygen
- temperature

- conductivity
- redox
- turbidity
- depth of well
- depth to water
- depth to pump intake
- purge end time
- volume of water purged

During low flow sampling, the water quality parameters including pH, conductivity, temperature, dissolved oxygen, redox, water level drawdown, and turbidity will be recorded at five (5) minute intervals. Samples will be collected after the parameters have stabilized for three (3) consecutive 5-minute intervals to within the specified ranges below:

- Water level drawdown (<0.3')
- Turbidity (+/- 10%, < 50-NTU for Metals Samples)
- pH (+/-0.1)
- Temperature (+/- 3%)
- Specific conductivity (+/- 3%)
- Dissolved Oxygen (+/- 10%)
- Oxidation reduction potential (+/- 10 millivolts)

Passive Sampling:

Groundwater samples will be collected via passive methods (i.e., no-purge) according to the following procedures and in the volumes specified in Table 10-1:

Samples will be collected via passive diffusion bag (PDB) samplers. PDB samplers are made of low-density polyethylene plastic tubing (typically 4 mil), filled with laboratory grade (ASTM Type II) deionized water and sealed at both ends.

- Pre-filled PDBs will not be stored for longer than 30 days and will be kept stored at room temperature in a sealed plastic bag until ready to use.
- PDBs filled in the field will be used immediately and not stored for future use.
- PDB samplers will only be used to collect groundwater samples which will be analyzed for VOCs.
- Mesh covers will be utilized for open rock holes as to not puncture the PDB and will be secured to the bag using zip-ties.
- PDB samplers will be deployed by hanging in the well at the depth(s) specified in the project-specific work plan. The depth at which the PDB is deployed will be recorded on the groundwater sampling form. The PDB samplers will be deployed at least 14 days prior to sampling;
- When transferring water from the PDB to sample containers, care will be taken to avoid agitating the sample, since agitation promotes the loss of volatile constituents;

- Gloves will be changed between collection of each PDB and tools used to open the PDB will be decontaminated with an alconox and potable water solution between each PDB;
- Any volume not used will be treated as investigation derived waste;
- Any observable physical characteristics of the groundwater (e.g., color, sheen, odor, turbidity) at the time of sampling will be recorded; and
- Weather conditions (i.e., air temperature, sky condition, recent heavy rainfall, drought conditions) at the time of sampling will be recorded.

6.1 PFAS Groundwater Sampling Procedure

Samples for PFAS analysis will be collected using PFAS-Free equipment, specifically a dedicated disposable high density polyethylene (HDPE) or PVC bailers, and/or low-flow sampling equipment with PFAS-Free components. Samples will be collected in bottleware provided by the laboratory. Because PFAS are found in numerous everyday items, the following special precautions will be taken during sampling activities:

- No use of Teflon®-containing materials (e.g., Teflon® tubing, bailers, tape, sample jar lid liners, plumbing paste).
- No use of low density polyethylene (LDPE)-containing materials.
- No Tyvek® clothing will be worn by samplers.
- Clothes treated with stain-resistant or rain-resistant coatings (e.g., Gortex®) will be not be worn by samplers.
- All clothing worn by sampling personnel must have been laundered multiple times.
- No fast food wrappers, disposable cups or microwave popcorn will be within the vicinity of the wells/ samples.
- There will be no use of chemical (blue) ice packs, aluminum foil, or Sharpies® within the vicinity of the wells/ samples.
- No use of sunscreen, insect repellants, cosmetic, lotions or moisturizers will be allowed by sampling personnel the day of sampling.
- If any of the above items are handled by the field personnel prior to sampling activities, field personnel will wash their hands thoroughly with soap and water prior to any sampling activities.
- Powder-free nitrile gloves will be worn during all sample collection activities.

Quality assurance/ quality control (QA/QC) samples for PFAS sampling will include one (1) field duplicate, one (1) matrix spike / matrix spike duplicates (MS/MSD) and one (1) equipment blank. The procedures and rationale for collecting these samples are described below.

- **Field duplicate** – Sample will be used to assess the variability in concentrations of samples from the same well due to the combined effects of sample processing in the field and laboratory as well as chemical analysis.

- **Matrix spike/matrix spike duplicate** – Sample will be used to provide information about the effect of the sample matrix on the design and measurement methodology used by the

laboratory.

- **Equipment blank** – Sample will be collected to help identify possible contamination from sampling equipment (i.e., bailer). One equipment blank will be collected by pouring laboratory certified analyte-free deionized water over a bailer into the sample container.

PFAS samples will be submitted to an Environmental Laboratory Accreditation Program (ELAP) certified laboratory for analysis of the full PFAS target analyte list (21 compounds listed in the NYSDEC Guidance) via modified USEPA Method 537 with a method detection limit not to exceed 2 ng/L. Note, the laboratory utilized will be ELAP certified for PFOA and PFOS in drinking water by EPA method 537 or ISO 25101 as ELAP does not currently offer certification for PFAS compounds in matrices other than finished drinking water.

7.0 Soil Vapor Intrusion Sampling Procedures

Soil vapor intrusion (SVI) sampling is to be conducted in accordance with the *NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 and subsequent updates. Tracer gas testing is to be conducted for sub-slab sampling points to ensure concentrations of the tracer gas are not detected in the sub-slab at greater than 10% of the concentration detected in the atmosphere. An outdoor air sample is to be collected at an upwind direction as a control. A building inventory should be completed to document building construction information and identify products that may be contributing to the levels in indoor air.

8.0 Field Documentation

8.1 Daily Logs/ Field Notebook

Daily logs are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings. Daily logs may be kept in a project-specific notebook labelled with the project name/ number and contact information.

The daily log is the responsibility of the field personnel and will include:

- Name of person making entry;
- Start and end time of work;
- Names of team members on-site;
- Changes in required levels of personnel protection:
  - Level of protection originally used;
  - Changes in protection, if required; and
  - Reasons for changes.
- Air monitoring locations, start and end times, and equipment identification numbers;
- Summary of tasks completed;

- Summary of samples collected including location, matrix, etc.;
- Field observations and remarks;
- Weather conditions, wind direction, etc.;
- Any deviations from the work plan;
- Initials/ signature of person recording the information.

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

Sample documents, forms, or field notebooks are not to be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document. If an error is made on a document assigned to one individual, that individual may make corrections simply by crossing a line through the error and entering the corrected information. The incorrect information should not be obliterated. Any subsequent error discovered on a document should be corrected by the person who made the entry. All corrections must be initialed and dated.

8.2 Photographs

Photographs will be taken to document the work. Documentation of a photograph is crucial to its validity as a representation of an existing situation. Photographs should be documented with date, location, and description of the photograph.

9.0 Investigation Derived Waste

Purpose:

The purposes of these guidelines are to ensure the proper holding, storage, transportation, and disposal of materials that may contain hazardous wastes. Investigation-derived waste (IDW) included the following:

- Drill cuttings, drilling mud solids;
- Water produced during drilling;
- Well development and purge waters, unused PDB waters;
- Decontamination waters and associated solids;

IDW will be managed in substantial accordance with DER-10 and all applicable local, State and Federal regulations.

Procedure:

1. Contain all investigation-derived wastes in Department of Transportation (DOT)-approved 55-gallon drums, roll-off boxes, or other containers suitable for the wastes.

2. Place different media in separate drums (i.e., do not combine solids and liquids).
3. To the extent practicable, separate solids from drilling muds, decontamination waters, and similar liquids. Place solids within separate containers.
4. Transfer all waste containers to a staging area. Access to this area will be controlled. Waste containers must be transferred to the staging area as soon as practicable after the generating activity is complete.
5. Label all containers with regard to contents, origin, and date of generation. Use indelible ink for all labeling.
6. Collect samples for waste characterization purposes, use boring/well sample analytical data for characterization.
7. For wastes determined to be hazardous in character, be aware on accumulation time limitations. Coordinate the disposal of these wastes with the Owner and NYSDEC.
8. Dispose of investigation-derived wastes as follows;
    - Soil, water, and other environmental media for which analysis does not detect organic constituents, and for which inorganic constituents are at levels consistent with background, may be spread on-site (pending NYSDEC approval) or otherwise treated as a non-waste material.
    - Soils, water, and other environmental media in which organic compounds are detected or metals are present above background will be disposed as industrial waste or hazardous waste, as appropriate. Alternate disposition must be consistent with applicable State and Federal laws.
    - Personal protective equipment, disposable bailers, and similar equipment may be disposed as municipal waste, unless waste characterization results mandate disposal as industrial wastes
9. If waste is determined to be listed hazardous waste, it must be handled as hazardous waste as described above, unless a contained-in determination is accepted by the NYSDEC.

10.0 Decontamination Procedures

Sampling methods and equipment have been chosen to minimize decontamination requirements and to prevent the possibility of cross-contamination. Decontamination of equipment will be performed between discrete sampling locations. Equipment used to collect samples between composite sample locations will not require decontamination between collection of samples. All drilling equipment will be decontaminated after the completion of each drilling location. Special attention will be given to the drilling assembly and augers.

Split spoons and other non-disposable equipment will be decontaminated between each sampling location. The sampler will be cleaned prior to each use, by one of the following procedures:

- Initially cleaned of all foreign matter;

- Sanitized with a steam cleaner;

  OR

- Initially cleaned of all foreign matter;
- Scrubbed with brushes in alconox solution;
- Triple rinsed; and
- Allowed to air dry.

Other sampling equipment including but not limited to low-flow sampling pumps, surface soil sampling trowel, water level meters, etc. will be decontaminated between sample location using an alconox solution. Consumables including gloves, tubing, bailers, string, etc. will be dedicated to one sample location and will not be reused.

11.0 Sample Containers

The containers required for sampling activities are pre-washed and ordered directly from a laboratory, which has the containers prepared in accordance with USEPA bottle washing procedures. The following tables detail sample volumes, containers, preservation and holding time for typical analytes.

Table 11-1
Groundwater Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	40-ml glass vial with Teflon-backed septum	Two (2); fill completely, no headspace	Cool to 4° C (ice in cooler), Hydrochloric acid to pH <2	14 days
Semi-volatile Organic Compounds (SVOCs)	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Polychlorinated biphenyls (PCBs)	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Metals	250-ml HDPE	One (1); fill completely	Cool to 4° C (ice in cooler) Nitric acid to pH <2	180 days (28 for mercury)
Cyanide	1,000-mL HDPE		Cool to 4° C (ice in cooler) Nitric acid to pH <2	14 days
1,4-Dioxane	40-ml glass vial with Teflon-backed septum	Three (3); fill completely, no headspace	Cool to 4° C (ice in cooler), Hydrochloric acid to pH <2	14 days
PFAS	250-mL HDPE, no Teflon	Two (2); fill completely	Cool to 4° C (ice in cooler), Trizma	14 days

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

TABLE 11-2
Soil Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14 days
VOCs via EPA 5035	40 mL vials with sodium bisulfate, methanol, and/or DI water	Three (3), 5 grams each	Cool to 4° C (ice in cooler)	2 days*
SVOCs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
PCBs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14/40 days
Metals	4-oz. glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	180 days (28 for mercury)
Cyanide	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14 days
1,4-Dioxane	40 mL vials with sodium bisulfate, methanol, and/or DI water	Three (3), 5 grams each	Cool to 4° C (ice in cooler)	2 days*
PFAS	8-oz HDPE, no Teflon	One (1); fill as completely as possible	Cool to 4° C (ice in cooler)	28 days

Note:
**Or freeze within holding time.*
All sample bottles will be prepared in accordance with USEPA bottle washing procedures.
Consult with laboratory as bottleware may vary by laboratory.
Holding time begins at the time of sample collection.

Table 11-3
Air Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	1 – Liter Summa® Canister	One (1) 1-Liter 1.4- Liter for MS/MSD	N/A	14 days

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

12.0 Sample Custody and Shipment

12.1 Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container:

AA-BB-CC-DD-EE

AA: This set of initials indicates an abbreviation for the Site from which the sample was collected.
BB This set of initials represents the type of sample (e.g., SB for soil boring and MW for monitoring well)
CC: These initials identify the unique sample location number.
DD: These initials identify the sample start depth (if soil sample)
EE These initials identify the sample end depth (if soil sample)

Each sample will be labeled, chemically preserved (if required) and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection when possible. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers. The sample label will give the following information:

- Date and time of collection
- Sample identification
- Analysis required
- Project name/number
- Preservation

Sample tags attached to or affixed around the sample container must be used to properly identify all samples collected in the field. The sample tags are to be placed on the bottles so as not to obscure any QC lot numbers on the bottles; sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the logbook.

For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

12.2 Chain of Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be utilized for all field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during their collection, transportation, and storage through analysis. All chain-of-custody requirements comply with standard operating procedures indicated in USEPA sample handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field notebooks;
- Sample label; and
- Chain-of-custody records.

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

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

As few persons as possible should handle samples. Sample bottles will be obtained pre-cleaned from the a laboratory. Sample containers should only be opened immediately prior to sample collection. The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules. The sample collector will record sample data in the field notebook and/or field logs.

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

12.3 Transfer of Custody and Shipment

The coolers in which the samples are packed must be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving them must sign, date, and note the time on the chain-of-custody record. This record documents sample custody transfer.

Shipping containers must be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information are entered on the chain-of-custody.

All shipments must be accompanied by the chain-of-custody record identifying their contents. The original record accompanies the shipment. The other copies are distributed appropriately to the site manager.

12.4 Custody Seals

Custody seals are preprinted adhesive-backed seals. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before shipment. On receipt at the laboratory, the custodian must check (and certify, by completing the package receipt log and LABMIS entries) that seals on boxes and bottles are intact. Strapping tape should be placed over the seals to ensure that seals are not accidentally broken during shipment.

13.5 Sample Packaging

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

- Sample bottle lids must never be mixed. All sample lids must stay with the original containers.
- The label should not cover any bottle preparation QC lot numbers.
- All sample bottles are placed in a plastic bag and/or individual bubble wrap sleeves to minimize the potential for cross-contamination and breaking.
- Shipping coolers must be partially filled with packing materials and ice when required, to prevent the bottles from moving during shipment.
- The sample bottles must be placed in the cooler in such a way as to ensure that they do not directly come in contact with other samples. Ice will be added to the cooler to ensure that the samples reach the laboratory at temperatures no greater than 4°C.
- Any remaining space in the cooler should be filled with inert packing material. Under no circumstances should material such as sawdust, sand, etc., be used.
- A chain of custody record must be placed in a plastic bag inside the cooler. Custody seals must be affixed to the sample cooler.

13.6 Sample Shipment

Shipping containers are to be custody-sealed for shipment as appropriate. The container custody seal will consist of tape wrapped around the package and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking the seal. Chain of custody seals shall be placed on the container, signed, and dated prior to taping the container to ensure the chain of custody seals will not be destroyed during shipment. In addition, the coolers must also be labeled and placarded in accordance with DOT regulations if shipping medium and

high hazard samples.

Field personnel will make arrangements for transportation of samples to the lab. The lab must be notified as early as possible regarding samples intended for Saturday delivery. The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States DOT in the Code of Federal Regulation, 49 CFR 171 through 177. All samples will be delivered to the laboratory and analyzed within the holding times specified by the analytical method for that particular analyte.

All chain-of-custody requirements must comply with standard operating procedures in the USEPA sample handling protocol.

13.7 Laboratory Custody Procedures

A designated sample custodian accepts custody of the shipped samples and verifies that the sample identification number matches that on the chain-of-custody record and traffic reports, if required. Pertinent information as to shipment, pickup, and courier is entered on the chain of custody or attached forms.

13.0 Deliverables

This section will describe laboratory requirement and procedures to be followed for laboratory analysis. Samples collected in New York State will be analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory. When required, analyses will be conducted in accordance with the most current NYSDEC Analytical Services Protocol (ASP). For example, ASP Category B reports will be completed by the laboratory for samples representing the final delineation of the Remedial Investigation, confirmation samples, samples to determine closure of a system, and correlation samples taken using field testing technologies analyzed by an ELAP-certified laboratory to determine correlation to field results. Data Usability Summary Reports will be completed by a third party for samples requiring ASP Category B format reports. Electronic data deliverables (EDDs) will also be generated by the laboratory in EQUIS format for samples requiring ASP Category B format reports.

NYSDEC DER-10 DUSR requirements are as follows:

a) Background. The Data Usability Summary Report (DUSR) provides a thorough evaluation of analytical data with the primary objective to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and data use.

    1. The development of the DUSR must be carried out by an experienced environmental scientists, such as the project Quality Assurance Officer, who is fully capable of conducting a full data validation. The DUSR is developed from:

i. A DEC ASP Category B Data Deliverable; or
ii. The *USEPA Contract Laboratory Program National Functional Data Validation Standard Operating Procedures for Data Evaluation and Validation.*

2. The DUSR and the data deliverables package will be reviewed by DER staff. If full third party data validation is found to be necessary (e.g. pending litigation) this can be carried out at a later data on the same data package used for the development of the DUSR.

b) Personnel Requirements. The person preparing the DUSR must be pre-approved by DER. The person must submit their qualifications to DER documenting experience in analysis and data validation. Data validator qualifications are available on DEC's website identified in the table of contents.
c) Preparation of a DUSR. The DUSR is developed by reviewing and evaluating the analytical data package. In order for the DUSR to be acceptable, during the course of this review the following questions applicable to the analysis being reviewed must be answered in the affirmative.

1. Is the data package complete as defined under the requirements for the most current DEC ASP Category B or USEPA CLP data deliverables?
2. Have all holding times been met?
3. Do all the QC data; blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?
4. Have all of the data been generated using established and agreed upon analytical protocols?
5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?
6. Have the correct data qualifiers been used and are they consistent with the most current DEC ASP?
7. Have any quality control (QC) exceedances been specifically noted in the DUSR and have the corresponding QC summary sheets from the data package been attached to the DUSR?

d) Documenting the validation process in the DUSR. Once the data package has been reviewed and the above questions asked and answered the DUSR proceeds to describe the samples and the analytical parameters, including data deficiencies, analytical protocol deviations and quality control problems are identified and their effect on the data is discussed.

14.0 Equipment Calibration

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set

forth in the applicable analytical methodology references. Operation, calibration, and maintenance will be performed by personnel properly trained in these procedures. Section 11 lists the major instruments to be used for sampling and analysis. In addition, brief descriptions of calibration procedures for major field and laboratory instruments follow.

15.1 Photovac/MiniRae Photoionization Detector (PID)

Standard operating procedures for the PID require that routine maintenance and calibration be performed every six months. Field calibration will be performed on a daily basis. The packages used for calibration are non-toxic analyzed gas mixtures available in pressurized containers. All calibration procedures will follow the manufacturer recommendations.

15.2 Conductance, Temperature, and pH Tester

Temperature and conductance instruments are factory calibrated. Temperature accuracy can be checked against an NBS certified thermometer prior to field use if necessary. Conductance accuracy may be checked with a solution of known conductance and recalibration can be instituted, if necessary.

15.3 O_2/Explosimeter

The specific meter used at the time of work shall be calibrated in accordance with manufacturer recommendations. The model 260 O_2/ Explosimeter is described below.

The primary maintenance item of the Model 260 is the rechargeable 2.4 volt (V) nickel cadmium battery. The battery is recharged by removing the screw cap covering receptacle and connecting one end of the charging cable to the instrument and the other end to a 115V AC outlet.

The battery can also be recharged using a 12V DC source. An accessory battery charging cable is available, one end of which plugs into the Model 260 while the other end is fitted with an automobile cigarette lighter plug.

Recommended charging time is 16 hours.

Before the calibration of the combustible gas indicator can be checked, the Model 260 must be in operating condition. Calibration check-adjustment is made as follows:

1. Attach the flow control to the recommended calibration gas tank.
2. Connect the adapter-hose to the flow control.
3. Open flow control valve.
4. Connect the adapter-hose fitting to the inlet of the instrument; after about 15 seconds the LEL meter pointer should be stable and within the range specified on the calibration sheet accompanying the calibration equipment. If the meter pointer is not in the correct range, stop the flow; remove the right hand side cover. Turn on the flow and adjust the "S" control with a small screwdriver to obtain a reading as specified on the calibration

sheet.

5. Disconnect the adapter-hose fitting from the instrument.
6. Close the flow control valve.
7. Remove the adapter-hose from the flow control.
8. Remove the flow control from the calibration gas tank.
9. Replace the side cover on the Model 260.

CAUTION: Calibration gas tank contents are under pressure. Use no oil, grease, or flammable solvents on the flow control or the calibration gas tank. Do not store calibration gas tank near heat or fire or in rooms used for habitation. Do not throw in fire, incinerate, or puncture. Keep out of reach of children. It is illegal and hazardous to refill this tank. Do not attach the calibration gas tank to any other apparatus than described above. Do not attach any gas tank other than MSA calibration tanks to the regulator.

15.4 Nephelometer (Turbidity Meter)

LaMotte 2020WE Turbidity Meter is calibrated before each use. The default units are set to NTU and the default calibration curve is formazin. A 0 NTU Standard (Code 1480) is included with the meter. To calibrate, rinse a clean tube three times with the blank. Fill the tube to the fill line with the blank. Insert the tube into the chamber, close the lid, and select “scan blank”.

TABLE 14-4
List of Major Instruments
for Sampling and Analysis

- MSA 360 0_2 /Explosimeter
- Geotech Geopump II AC/DC Peristaltic Pump
- QED MP50 Controller and QED Sample Pro MicroPurge Bladder Pimp
- Horiba U-53 Multi-Parameter Water Quality Meter
- LaMotte 2020WE Turbidity Meter
- EM-31 Geomics Electromagnetic Induction Device
- Mini Rae Photoionization Detectors (3,000, ppbRAE, etc.)

15.0 Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of field equipment. Field-based QC will comprise at least 10%

of each data set generated and will consist of standards, replicates, spikes, and blanks. Field duplicates and field blanks will be analyzed by the laboratory as samples and will not necessarily be identified to the laboratory as duplicates or blanks. For each matrix, field duplicates will be provided at a rate of one per 10 samples collected or one per shipment, whichever is greater. Field blanks which may consist of trip, routine field, and/or rinsate blanks will be provided at a rate of one per 20 samples collected for each media, or one per shipment, whichever is greater. Frequency of QC data may vary from project to project; refer to the project-specific work plan for QC requirements.

Calculations will be performed for recoveries and standard deviations along with review of retention times, response factors, chromatograms, calibration, tuning, and all other QC information generated. All QC data, including split samples, will be documented in the site logbook and/or appropriate field logs. QC records will be retained and results reported with sample data.

16.1 Field Blanks

Various types of blanks are used to check the cleanliness of field handling methods. The following types of blanks may be used: the trip blank, the routine field blank, and the field equipment blank. They are analyzed in the laboratory as samples, and their purpose is to assess the sampling and transport procedures as possible sources of sample contamination. Field staff may add blanks if field circumstances are such that they consider normal procedures are not sufficient to prevent or control sample contamination, or at the direction of the project manager. Rigorous documentation of all blanks in the site logbooks is mandatory.

- **Routine Field Blanks** or bottle blanks are blank samples prepared in the field to access ambient field conditions. They will be prepared by filling empty sample containers with deionized water and any necessary preservatives. They will be handled like a sample and shipped to the laboratory for analysis.
- **Trip Blanks** are similar to routine field blanks with the exception that they are **not** exposed to field conditions. Their analytical results give the overall level of contamination from everything except ambient field conditions. For the RI/FS, one trip blank will be collected with every shipment of water samples for VOC analysis. Each trip blank will be prepared by filling a 40-ml vial with deionized water prior to the sampling trip, transported to the site, handled like a sample, and returned to the laboratory for analysis without being opened in the field. Trip blanks may be provided by the laboratory, shipped with the bottleware, and kept with the sampling containers until analysis.
- **Field Equipment Blanks** are blank samples (sometimes called transfer blanks or rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use, and that cleaning procedures between samples are sufficient to minimize cross contamination. If a sampling team is familiar with a particular site, they may be able to predict which areas or samples are likely to have the highest concentration of contaminants. Unless other constraints apply, these samples should be taken last to avoid excessive contamination of sampling equipment.

16.2 Duplicates

Duplicate samples are collected to check the consistency of sampling and analysis procedures. The following types of duplicates may be collected.

- **Blind duplicate** samples consist of a set of two samples collected independently at a sampling location during a single sampling event. Blind duplicates are designed to assess the consistency of the overall sampling and analytical system. Blind duplicate samples should not be distinguishable by the person performing the analysis.
- **Matrix Spike and Matrix Spike Duplicates (MS/MSDs)** consist of a set of three samples collected independently at a sampling location during a single sampling event. These samples are for laboratory quality control checks.