REMEDIAL INVESTIGATION WORK PLAN

Harrison Place
Northwest Corner – Intersection of South & Washburn Street
Lockport, New York
Tax Map ID No.: P/O 109.14-4-20.1
Property County: Niagara
Site No.: C932177

Prepared For:

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1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) document presents details of work activities designed to support a Remedial Investigation (RI) at the Harrison Place (Site) which is Building No. 3 of the former Harrison Radiator factory complex. The 475,000-square foot facility, consisting of a 5-building complex, is bounded by Walnut, Washburn, South, and Locust Streets in Lockport, New York. The project site, Building No. 3, is located in the southeast corner of the former factory at the northwest corner at the intersection of South and Washburn Street, which is just south of Main Street in downtown Lockport, the county seat of Niagara County, New York. (See **Figure 1**). The Kearney Realty & Development Group Inc. has entered the Brownfield Cleanup Program (BCP) to remediate the Site for the redevelopment of the property that includes redevelopment into a multi-unit apartment building with first floor neighborhood commercial uses that support the building tenants and community. A BCP project schedule is provided in **Figure 2**.

Environmental assessments and investigations conducted on the Site concluded that there are impacted soils below the concrete slab and impacted groundwater due to the property's former use. A Previous Phase II Environmental Site Assessment (ESA) identified site soils that have been impacted with heavy metals and polynuclear aromatic hydrocarbon (PAH) related compounds as well as chlorinated solvents. Groundwater was impacted with chlorinated solvents and chlorinated solvents were found in sub-floor vapor samples.

The purpose of the RI phase of the BCP is to address the following activities and requirements:

- Obtain environmental data from the site under site specific quality assurance/quality control (QA/QC) for sampling, analyses, and data evaluation.
- Provide plans and approaches for health and safety and air monitoring for field activities.
- Summarize previous environmental assessments and investigations.
- Describe and illustrate the physical conditions of the site including surface waterbodies, ecological receptors, significant utility corridors.
- Tabulate and illustrate proposed sampling plan and results to include location, matrix, depth, analytes, methodologies, rationale, and QA/QC.
- Provide a schedule of activities and details of the proposed investigation team.
- Describe the areas of concern including impacted soils, fill material, groundwater, indoor air, and building conditions.
- Determine the necessity of a fish and wildlife impact analysis and, if required, gather data to evaluate impacts.
- Complete a qualitative exposure assessment for human health and fish/wildlife resources.
- Ensure (1) field work is sufficiently comprehensive to evaluate natural attenuation of groundwater, as applicable, and (2) all waste derived from field work is managed in a manner that does not negatively impact human health and the environment.

1.1 SITE HISTORY AND DESCRIPTION

The former factory complex is currently referred to as Commerce Square. The property is located in the City of Lockport, New York, and is bounded on the north by Walnut Street, on the east by Washburn Street, on the south by South Street, and on the west by a parking lot (refer to **Figure 1**). Presently, most of the building space is vacant, although portions are used by several small businesses and for storage.

The Commerce Square site was used from 1914 to 1987 by the Harrison Radiator Division of General Motors Corporation. The facility was used to manufacture copper and brass automobile parts including thermostats, vacuum and electrical switches, modulators, and heat exchangers. Processes reportedly included: metal pressing; metal stamping and forming; metal finishing and assembly; tin and lead soldering and brazing; parts washing and degreasing; injection molding; painting; heat treating; tool design; and quality control testing. At the time of plant closure, most of the equipment, materials, and other items were reportedly removed and either sold or transferred to another Harrison Radiator facility.

The 475,000-square foot facility consists of five buildings. Building Nos. 2 and 3 are interconnected 3-story former manufacturing buildings. Building No. 4 is a three-story structure that was used for research and development, testing, and office space. Building No. 1 contained offices, meeting rooms, a cafeteria and other support areas. Building No. 1A is a small separate section on the western end of Building No. 3 which had offices and security.

The building floors are constructed of wood, concrete, or asphalt-coated concrete. Process equipment was typically installed above concrete collection sumps, however, site closure inspection reports identified that floors were stained and contained metal shavings and other items in some locations. The final site inspection reports during site closure completed by O'Brien & Gere in 1987 and 1988 (*Environmental Audit and Closure Evaluations. Prepared by O'Brien & Gere for Harrison Radiator Division, May 1987 and Harrison Radiator Asbestos Removal - Phase I Buildings 1, 2, and 3 prepared by O'Brein & Gere for Harrison Radiator, April 12, 1988)* indicates that a very thorough facility closure was completed by Harrison Radiator at that time. The facility closure included removal of all equipment, piping, and ductwork; solids were removed; chemical inventories were removed; sumps, pits and sewers were cleaned; and asbestos was removed. According to the 1987 plant closure report, prior comprehensive environmental audits performed in 1977, 1981, and 1985, identified minor problems. The facility wastewater discharges to the combined sanitary/process sewer which is part of the City of Lockport municipal system.

Building No. 3 was the main production and assembly building for Harrison Radiator. It is a three-story structure with an open, full height center section, which runs the full length of the building. This open center section contains an overhead crane, which is located directly beneath a continuous skylight. The second and third floors are located on the north and south sides of the building with the high-bay, skylight down the center. Building No. 3 has a series of vertical columns on both the north and south sides of the building which support the upper floors, but otherwise the building is open. The concrete floor is generally level, and any previous floor drains, pits, or other building features have been filled and leveled. In general, the concrete floor of Building No. 3 was 6 to 12 inches thick at previous boring locations. However, certain areas of the floor within this building were thicker than 12 inches. Floor coring at several locations within Building No. 3 was attempted and abandoned after reaching the maximum depth of the portable concrete coring machine (approximately 18 inches). These thicker floor locations may have corresponded with building footers, or with the former walls of unknown sub-grade features. A small basement area is located in the southwest corner.

The Harrison Complex has a history of subsurface petroleum storage mostly located west of Building No. 2 in the alley; however, at least three tanks were located west of Building No. 3. Closure documentation identified that a total of thirteen underground storage tanks (USTs) were located on the property as follows (identified as Tanks T1 through T6 on plant closure documentation figures):

- Two 10,000 -gallon tanks (T1) - West of Building No. 2 possibly beneath Elm Street. These tanks contained Naphtha and were closed in the 1960s by filling with water and later closed in 1986 by filling with concrete.

- Four 5,500-gallon tanks (T2) - East of Building No. 4. These tanks contained gasoline/diesel. Closed and filled with water in the 1960s and filled with concrete/removed in 1986.

- One 2,500-gallon tank (T3) - West of Building 3 possibly beneath Elm Street. This tank contained liquid detergent and was closed in the 1960s by filling with water and later closed in 1986 by filling with concrete.

- Three 20,000-gallon tanks (T4) - located adjacent to the storage yard and west of the boiler house in Building No. 3. These tanks contained fuel oil and were removed in 1987.

- One 500-gallon tank (T5) - located north of Building No. 2 beneath the Walnut Street sidewalk. This tank was closed in the 1960s by filling with water and later closed in 1986 by filling with concrete. This tank was removed in 2004

- One 750-gallon tank (T6) - located north of Building No. 2 beneath the Walnut Street sidewalk. This tank was closed in the 1960s by filling with water and later closed in 1986 by filling with concrete. This tank was removed in 2004 (see below).

- One 1,000-gallon tank - located under the sidewalk along Walnut Street in front of Building No. 4. This tank was removed in 2004 (see below).

A New York State Department of Environmental Conservation (NYSDEC) Spill Report was opened on November 29, 1999 (Spill # 9975547). The spill was reported by the City of Lockport Sewer & Water Division when petroleum odors were noted by a worker repairing a fire hydrant. The spill report identifies that Tanks T5 and T6 as well as the UST located in front of Building No. 4 (located under the Walnut Street sidewalk) were removed in 2004. During UST closure activities, the three USTs were removed, 145 tons of petroleum impacted soil were removed, 12,350-gallons of water was disposed of, and the spill was closed in 2005.

1.2 CONTEMPLATED USE OF THE SITE

The proposed redevelopment includes converting Building No. 3 into an affordable housing facility with some ground-level community commercial space. This three-story (400 feet by 150 feet) reinforced concrete industrial structure includes an atrium with an overhead peaked skylight, both extending the length of the building and flooding it with natural light. The atrium was originally designed to allow a gantry crane to transport heavy loads from one end of the building to the other, including between floors and above. The proposed first-floor community retail uses include the existing farmers market, which operates on weekends, a restaurant or possibly a distillery with a restaurant component, a bank, medical/dental offices, grocery, or other office/retail uses that can enhance the lives and daily needs of the building tenants.

1.3 PROJECT ORGANIZATION

The following personnel constitute the primary members of the project team:

Project Manager – Peter J. Gorton, MPH; CHCM.
Engineers – John Berry, P.E. and Jason M. Brydges, PE
Project Staff and Field Technicians – Jake Tracy, EIT; Jesse Zientek, Environmental Engineer; and Dalton Stack, Environmental Scientist
Health and Safety Officer – Peter J. Gorton, MPH and CHCM
QA/QC – John Berry, PE
Project Geologist – John Boyd
Attorney – Larry Schnapf – The Schnapf LLC
Asbestos/lead/universal waste subcontractor – AMD Environmental
Drilling/Excavation subcontractors – to be determined
Analytical Laboratory – to be determined

2.0 GOALS AND OBJECTIVES

2.1 RI OBJECTIVES

In general, an RI has the following objectives as described in New York Codes, Rules and Regulations (NYCRR) Part 375-1.8(e):

- Delineation of the extent of the contamination at and emanating from all media at the Site and the nature of that contamination.
- Characterization of the surface and subsurface characteristics of the Site, including topography, surface drainage, stratigraphy, depth to groundwater, and any aquifers that have been impacted or have the potential to be impacted;
- Identification of the sources of contamination, the migration pathways, and actual or potential receptors of contaminants;
- Evaluation of actual and potential threats to public health and the environment; and,
- Production of data of sufficient quality and quantity to support the necessity for, and the proposed extent of, remediation and to support the evaluation of proposed alternatives.

2.2 SPECIFIC GOALS

Based on the data collected to date and history of the Site, RI activities have been developed that will allow for further assessment of fill material and depth of native soil, depth to bedrock, and depth to groundwater. The potential for vapor will also be further assessed to include a vapor intrusion investigation in accordance with NYSDEC/New York State Department of Health (NYSDOH) protocol. Specific goals for the RI are as follows:

- Perform additional soil borings below the slab to add to the existing data. The focus will be on impacted areas identified during the previous investigations;
- Install and sample additional groundwater wells to complement existing wells and to assess potential contamination and its sources (i.e., on or off-Site), direction of groundwater flow, and potential impacts;
- Conduct additional building environmental condition assessment as necessary after a review of existing surveys that may include asbestos containing material (ACM),

lead-based paint (LBP), and other indoor hazardous materials within the existing structures.

- Perform a hydraulic assessment of the groundwater in the subsurface using the installed wells;
- Complete additional vapor assessments to add to existing data from previous investigations at Building No. 3 and adjacent Building No. 4; and
- Fill any data gaps resulting from previous assessments.

To the extent possible, RI field work will also include the identification of any significant structures, sensitive areas, or appurtenances that could have an impact on contaminant migration or future remedial action such as any existing stormwater and/or sewer lines.

2.3 CONTAMINANTS AND AREAS OF CONCERN

Based on the findings related to historic use of the Site and previous investigations, contaminates of concern (COCs) in the soils are semi-volatile organic compounds (SVOCs), heavy metals. Chlorinated solvents were detected in Site soils, groundwater, and vapors. However, the full suite of soil contaminants as identified in 6 NYCRR Part 375 will be analyzed during the RI. Groundwater samples will also be analyzed for the full suite of contaminants per NYSDEC Division of Water TOGS. See **Figure 4** for an illustration on exceedances based upon the previous investigation results.

The existing buildings will also be assessed for hazardous materials and universal wastes such as ACM in floors/caulk/roofing/insulation, LBP in ceilings/structures/windows/walls/doors, polychlorinated biphenyls (PCBs) in light ballasts and caulk throughout the building, and mercury in fluorescent bulbs. It is important to note that groundwater at the site has not been sampled.

3.0 PAST ENVIRONMENTAL ASSESSMENTS/INVESTIGATIONS

3.1 1987-1988 - *ENVIRONMENTAL AUDIT AND CLOSURE EVALUATIONS. PREPARED BY O'BRIEN & GERE FOR HARRISON RADIATOR DIVISION, MAY 1987 AND HARRISON RADIATOR ASBESTOS REMOVAL - PHASE I BUILDINGS 1, 2, AND 3 PREPARED BY O'BREIN & GERE FOR HARRISON RADIATOR, APRIL 12, 1988*

This indicated that a very thorough facility closure was completed by Harrison Radiator at that time. The facility closure included removal of all equipment, piping, and ductwork; solids were removed; chemical inventories were removed; sumps, pits and sewers were cleaned; and asbestos was removed. According to the 1987 plant closure report, prior comprehensive environmental audits performed in 1977, 1981, and 1985, identified minor problems. The facility wastewater was discharged to the combined sanitary/process sewer and sent through the City of Lockport municipal system. These reports also indicate that some USTs were closed in place by filling with cement.

3.2 *PHASE I ENVIRONMENTAL SITE ASSESSMENT COMMERCE SQUARE, CITY OF NIAGARA FALLS, NIAGARA COUNTY, NEW YORK, PREPARED BY PEI FOR NIAGARA COUNTY, JULY 2006*

This assessment did identify obvious potential recognized environmental conditions (RECs) associated with the property and buildings which included:

- The past use of the property for the manufacturing of automobile parts including use and storage of solvents, paints, petroleum, and other materials.

- Use and storage of large quantities of petroleum in USTs. Some of these USTs have been removed, however, some were closed-in-place and remnant contamination may exist.

- During operational life, reportedly there were over 100 permitted air emission sources at any time.

3.3 NOVEMBER 2009 *PHASE II ENVIRONMENTAL SITE ASSESSMENT COMMERCE SQUARE, CITY OF NIAGARA FALLS, NIAGARA COUNTY, NEW YORK, PREPARED BY PEI FOR NIAGARA COUNTY*

The investigation represents a limited assessment of subsurface conditions to determine if previous historic activity pertaining to the USTs significantly impacted subsurface soils. The assessment suggested that the soil is impacted in this area and that the compounds released into the environment have degraded. It should be noted that the actual UST locations were not confirmed and therefore, soil boring locations were selected in such a manner as to ensure a proper distance away from the assumed locations. In addition, the number of borings was limited due to utilities and refusal because of subsurface obstacles (roadbed and foundations). Therefore, the actual levels of compound in soil may be greater adjacent to the actual tank locations.

3.4 SEPTEMBER 2010 ENVIRONMENTAL SITE ASSESSMENT; COMMERCE SQUARE PROPERTY (AKA HARRISON PLACE), CITY OF LOCKPORT, NIAGARA COUNTY; SITE #932141. PREPARED BY NYSDEC

This ESA was performed to provide a more comprehensive characterization of the various site media. The assessment included an examination of soils under all known and suspected industrial processing areas (Buildings Nos. 2, 3, and 4), as well as various exterior property locations that had not been previously characterized (south and west of Building No. 4). The assessment also included an examination of the uppermost significant groundwater zone – the upper bedrock.

A total of 59 soil borings were completed under these buildings. Soils under the buildings were described as generally native silts and clays and were present to the top of bedrock. Visual evidence of contaminated soils (discolorations, free product, etc.) under the site buildings or elevated photoionization detector (PID) readings were minimal and restricted to only a few areas. Those soils with notable odors or those that registered high VOC concentrations when screened with a PID were selected for laboratory analysis. Only one soil sample from beneath the buildings (Sample B3-18) contained contaminant concentrations above Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs). Building No. 3 was the main production and assembly building for Harrison Radiator. It is a three-story structure with an open, full height center section, which runs the full length of the building. This open center section contains an overhead crane, which is located directly beneath a continuous skylight. The second and third floors of Building No. 3 are located on the north and south sides of the building.

Building No. 3 has a series of vertical columns on both the north and south sides of the building which support the upper floors, but otherwise the building is completely open. The concrete floor was generally level, and any previous floor drains, pits, or other building features have since been filled and leveled. In general, the concrete floor of Building No. 3 was 6 – 12 inches thick at the boring locations. However, certain areas of the floor within this building were between 12 and 18 inches thick. Floor coring at several locations within Building No. 3 was attempted and abandoned after reaching the maximum depth. These thicker floor locations may have corresponded with building footers, or with the former walls of unknown sub-grade features.

Twenty-seven soil borings were completed within Building No. 3. In general, the profile of the subsurface under the building consisted of about 2 feet of concrete and gravel over about 18 feet of silt and clay. Slight odors were noted in two of the locations within the building (Borings B3-09 and B3-13). These two locations also had PID readings of up to 88 parts per million (ppm). Two other locations (Borings B3-16 and B3-18) had PID readings (up to 72ppm), but odors were not observed at these locations. The odors and/or PID detections at Borings B3-09, B3-13, and B3-18 were generally noted within the 6-to-10-foot depth interval, which corresponded with the dense silt layer. Soils at Boring B3-16 were not native. The soil from this location was course sand – most likely a fill material. The Geoprobe sampler hit refusal at about 7 feet below ground surface (bgs) at Boring B3-16, which suggests that this location may have corresponded to a former sump, trench, or pit within this building that was later filled. The soil intervals with the highest PID readings at Borings B3-16 and B3-18 were collected for laboratory analysis. Soil at both of these locations contained various contaminants typically associated with organic solvents. The sample collected from Boring B3-16 contained the following VOCs: tetrachloroethene (PCE) (up to 15 ppb), trichloroethene (TCE) (up to 4.9 ppb), 1,1 dichloroethane (up to 3.6 ppb), and cis-1,2 dichloroethene (up to 310 ppb). Sample B3-18 contained the following VOCs: tetrachloroethene (up to 15 ppb), trichloroethene (up to 4.9 ppb), 1,1 dichloroethane (up to 3.6 ppb), and cis-1,2 dichloroethene (up to 310 ppb). Sample B3-18 contained the following VOCs: trichloroethene (up to 1,160 ppb), 1,1,2-trichloroethane (up to 4.5 ppb), and cis-1,2 dichloroethene (up to 43 ppb). None of these VOCs were detected above the Part 375 Restricted Residential Use SCOs.

The groundwater flow direction is toward the northwest and towards Erie Canal which is located approximately 1,000 feet northwest of the Site. Groundwater from location BR-1, located near the southwest corner of the property, had trace concentrations of gasoline constituents (MTBE and naphthalene) below NYSDEC Class GA groundwater standards. Well BR-2, located near the former USTs near the south-central plant gate, had concentrations of several VOCs - concentrations of gasoline constituents, and higher concentrations of solvent constituents detected above groundwater standards including benzene, TCE, and associated TCE breakdown products (cis and trans-1,2-dichloroethene and vinyl chloride).

Well BR-1, located near the southwest corner of the property, had trace concentrations of gasoline constituents (MTBE and naphthalene) below NYSDEC Class GA groundwater standards. Well BR-2, located near the former underground storage tanks near the south-central plant gate, had concentrations of several VOCs. The compounds detected included trace concentrations of gasoline constituents, and higher concentrations of solvent constituents. The following contaminants were detected above groundwater standards: benzene, TCE, and associated TCE breakdown products (cis and trans-1,2-dichloroethene and vinyl chloride). Groundwater from Well BR-3, located near the former USTs near the north-central plant gate, contained concentrations of several VOCs and SVOCs. The VOC compounds that were detected included trace concentrations of gasoline constituents, with higher concentrations of solvent constituents. The following contaminants were detected above groundwater standards: benzene, xylenes, PCE, TCE, and associated TCE breakdown products (cis and trans-1,2-dichloroethene and vinyl chloride). The highest VOC concentration detected in groundwater at this location was TCE at 3,900 ppb. Groundwater from Well BR-4, located at the northwestern corner of the property, also had concentrations of several VOCs. The VOC compounds detected were solvent constituents including TCE and its associated breakdown products (cis and trans-1,2-dichloroethene, 1,1-dichloroethene, 1,1-dichloroethane, and vinyl chloride).

3.5 December 2019 Subsurface Investigation Report Commerce Square – Former Harrison Radiator Factory Building #3 Washburn and South Streets, Lockport, New York 14094. Completed by Jade Environmental, Inc for Kearney Realty & Development Group. This was completed for the BCP application.

Seven borings were completed through the concrete slab. In five locations the concrete slab was approximately 7 inches thick, in one location approximately 9 inches, and at TP-1 in the northeast corner, the concrete was approximately 1 inch thick and a void existed beneath the slab. A thick layer of ash and cinder was identified in some probe locations, in other locations a medium grained sand was identified. Beneath these bedding materials a heavy clayey silt formation was encountered. Soil analysis revealed metals and PAHs from the ash and VOCs at TP-7. In all, five sub-slab vapor samples were collected and analyzed for VOCs via Method TO+15. Sub-slab vapor analysis reveals chlorinated solvent contamination is a sitewide contaminant condition.

4.0 INTERIM REMEDIAL MEASURES (IRM)

The primary objective of remediation is to reduce or eliminate receptor exposure to contaminants through the removal or stabilization of source contamination identified in media. Interim remedial measures (IRMs) are actions taken to mitigate exposures before the completion of the RI and remedial alternative selection. Examples of typical IRMs include the removal of source areas/hotspots/wastes, construction of collection or recovery systems, installation of engineered barriers and controls, and installation of vapor control systems.

If the need for implementing an IRM is determined during the RI, the NYSDEC will be notified and the IRM will be defined as emergency or non-emergency. Emergency IRMs are addressed as a spill response and are time-critical that are not subject to DER-10 (i.e., other guidance applies, such as Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA], spill response guidance manual, etc.). Non-emergency IRMs, such as drum removals, construction of fencing, and posting of warning signs can be performed at any time during the BCP in response to existing or potential exposures at the Site. These are best utilized when it is cost effective to complete the IRM prior to the remedial investigation and remedy selection process. In these cases, DER-10 will be followed and include corresponding documentation and oversight/approval by NYSDEC.

The most significant advantage to using IRMs is the reduction in schedule of any impending remedial activities since they may be conducted concurrently with sampling to delineate the contamination and to confirm contaminant removal. The Site does not appear to possess the potential exposures or scheduling issues that would require use of an IRM. However, the need for and design of an IRM will be developed as necessary following the implementation of the RI.

5.0 INVESTIGATION SCOPE OF WORK

5.1 INTRODUCTION

The investigation will include, soil analysis, groundwater analysis, hydraulic assessment, building inventory assessment, and other assessments related to building materials and vapor intrusion sampling. All investigation field work will be completed in accordance with the Health and Safety Plan (HASP) and the Community Air Monitoring Program (CAMP) which are provided in **Appendix A**. ACM, LBP, building PCBs, mold, etc. will be surveyed based on a review of the recent surveys completed on the building and will be included, as needed, to supplement recently completed surveys as part of the RI report and Alternatives Analysis Report (AAR). It is anticipated that the RI can be completed in a single phase and include the following:

- Soil investigation in Building No. 3 to supplement previous investigation findings (soil borings, sampling, and chemical analysis),
- Groundwater investigation within Building No. 3 to supplement wells at other locations on the property (well installation, sampling, and chemical analysis);
- Building inventory assessment (as a supplement to any previously available surveys);
- Hydraulic assessment of subsurface groundwater;
- Hazardous materials and universal waste survey/assessment; and
- A vapor intrusion assessment.

5.2 SUBSURFACE SUB-SLAB SOIL

Sub-slab soil assessments have been conducted during recent investigations completed by others (Refer to **Section 3.0**). As such the objective of the RI sub-slab soil assessment will be to use the previous data and complete a subset across the slab with additional borings in areas of concern identified in previous assessments. Twenty-three soil borings will be completed; 18 in the main area and five in the basement/area not previously investigated. The borings will be spread out with a focus on (1) previously identified impacted areas, (2) areas where investigation has not been conducted, and (3) areas where previous historical operations may have had industrial activities (See **Figure 5**). The precise sampling locations will be based on field observations and will specifically target potential contaminant features while ensuring that areas of concern are examined.

The primary purpose of the sub-slab subsurface assessment is to visually inspect and characterize subsurface soil conditions below and across the entire building. The objective is to confirm the depth of fill material beneath the concrete slab and to collect and analyze fill samples and native soil, if appropriate based on depth, below the slab. Secondly, the extent of known contamination will be quantified as data allows. Lastly, areas that may be source areas of contamination will be identified. The borings will be advanced to a depth between 8 to 12 feet bgs, to native soil, or refusal using Geoprobe® direct push technology. The borings will be advanced deeper than 12 feet if environmental impacts appear to continue deeper than 12 feet. The final depth of the borings will be determined by access and ability to drill inside an existing building with limited ceiling heights. Continuous soil sampling will be conducted using a Geoprobe® with a two-inch diameter, 4-foot-long sampler. A PID will be used to assess potential downward migration in the soil below the fill layer. If impacts are observed either by visual/olfactory observations or PID readings, the boring will be advanced as deep as possible based on equipment location and limitations. If no impacts are identified in a soil boring slated for soil samples, samples will be collected from the bottom interval of the boring or from immediately above confirmed confining layers. At each boring location the following will be recorded:

- Thickness and characteristics of the cover/fill material;
- Depth to bedrock, if encountered;
- Depth to groundwater, if encountered;
- Thickness and characteristics of the native soil, if encountered;
- PID screening results; and
- Estimated depth of analytical samples collected.

A detailed log of these records will be maintained to assist field personnel in selecting the most appropriate sample at each location, and to supplement future analytical results. An estimated 14 additional soil samples (in addition to those collected during prior investigations) will be collected for laboratory analyses as follows:

- Seven fill samples will be collected from soil below the slab to represent the total property area/area that indicates impacts
- Four fill samples will be collected in the basement area not previously sampled
- Three “native” soil, as available will be collected just below the fill layer from areas across the property

Samples will be selected based upon (1) areas that appear to be impacted based upon visual, olfactory, or PID observations, (2) areas of natural soil at interface with fill material, and (3) known fill material that may or may not be impacted but believed to represent Site soils. As per DER-10 Section 3.11(b)3, if more than one type of historic fill material is encountered in any boring or test pit, one sample is required for each type of fill material encountered. All soil samples collected from the borings will be grab samples. Proposed soil samples to be collected are summarized in **Appendix B** – Quality Assurance/Quality Control Plan. Please note that all surface samples collected will originate from the top 2 inches of surface material below any vegetative or hardscape cover.

The soil samples will be analyzed by a NYSDOH environmental laboratory accreditation program (ELAP) certified laboratory that produces NYSDEC Category B data package deliverables. Data Usability Summary Reports (DUSRs) will be prepared for all samples. All samples will be analyzed for the full Part 375 Brownfields constituent list which includes the following:

- VOCs
- SVOCs
- Metals
- PCBs
- Pesticides
- PFAS (PFOA/PFOS) in fill materials only

Any subsurface disturbance, boring or test pit, will be performed at a minimum distance of 2.5 feet away from marked utilities to reduce the risk damaging an underground utility line. All boreholes will be filled with indigenous soil or clean sand prior to leaving each location. Field equipment will be operated in accordance with standard practices and in a safe and efficient manner as to minimize any hydraulic system leaks or lubricant and fuel leaks (See **Appendix A** for details).

Additional field activities performed by the geologist/technician include properly labeling, packaging, delivering samples to the laboratory; supervising field operations; and completing boring logs, which can be performed in the office after recording field data. The geologist/technician will update the Project Manager daily on progress in the field and results of the subsurface investigation. Major changes in the subsurface investigations will not occur unless approved by the Project Manager, who will also notify the Client and NYSDEC regarding project developments. A detailed description of the sampling methods is provided in the **Appendix C** – Field Sampling Plan.

5.4 GROUNDWATER

Using the information from previous well installation, three bedrock groundwater monitoring wells (See **Figure 5**) will be installed using a conventional truck mounted drill rig using hollow stem auger drilling techniques and standard rock coring equipment. **These will be installed in the building, however, if the drill rig cannot function in the building due to height constraints, the wells will be installed outside immediately adjacent to the building assuming access and permission can be obtained from the adjacent property owners.** Since the middle atrium area is the only area withing the building capable of allowing drilling (due to height restrictions), the three wells will be placed down the center of the building. For each bedrock well, once auger refusal is encountered, a 4-inch diameter steel casing will be installed and cemented into the bedrock. The cement will be allowed to set over night and the bedrock cored with a 3-inch nominal rock core to approximately 10 feet into the bedrock. Once coring is completed, with the agreement of NYSDEC, the hole will be left open with no casing or filter pack. In addition to the three bedrock wells, two 1-inch overburden monitoring wells will be installed to approximately 20 feet bgs, if groundwater is encountered, within the building to help assess the groundwater conditions. A sand pack will be placed to approximately 2 feet above the 1-inch well screen and a bentonite seal will be placed above the sand pack. The wells will be completed with flush mount monuments.

The data (soil types, rock depth, groundwater depth) obtained from installation of the first well will be used to guide the installation of the remaining wells. Installation of wells will also adhere to the requirements provided in the Field Sampling Plan provided in **Appendix C**. Boring logs (if necessary) and well completion diagrams will be provided in the RI report. All field work will adhere to the HASP and CAMP, which are provided in **Appendix A**.

The wells will be developed at least 24 hours following installation and will be sampled at least 24 hours following development. Well development and sampling will be in accordance with the Field Sampling Plan. One groundwater sample will be collected from each well. In addition to sampling the newly installed wells, an attempt will be made to locate the bedrock monitoring wells that were installed in 2010. If the wells are located, one groundwater sample will be collected from three of the four wells (Wells BR-1, BR-3, and BR-4, if located. Groundwater samples will be submitted to the same New York State ELAP-certified laboratory and analyzed for the following Part 375 brownfield constituents and emerging contaminants:

- VOCs
- SVOCs
- Metals

- PCBs
- Pesticides
- 1,4-dioxane
- PFAS (PFOA/PFOS)

All sample analysis will be in accordance with ASP, Cat B requirements. QA/QC requirements for all sample analysis are provided in **Appendix B** that summarizes the number of groundwater samples to be collected. All detected sample concentrations will be included in a table and compared to NYSDEC TOGS.

5.5 WATER SAMPLING

During a site visit in 2020, standing water was observed within the basement area of the building. It is assumed that there is a sump located within the basement area. One analytical water sample will be collected from the sump or the standing water within the basement if the sump is not accessible. The sample will be collected using a disposable bailer or a similar alternative. The sample will be analyzed for the following:

- VOCs
- SVOCs
- Metals
- PCBs
- Pesticides
- 1,4-dioxane
- PFAS (PFOA/PFOS)

The sample analysis will be in accordance with ASP, Cat B requirements. All detected sample concentrations will be included in a table and compared to NYSDEC TOGS.

5.6 GROUNDWATER HYDRAULIC ASSESSMENT

Hydraulic assessment includes the completion of hydraulic conductivity tests and the measurement of water levels in monitoring wells. Hydraulic conductivity testing will be performed on the newly installed monitoring wells using a variable head method. Variable head tests will be completed using a stainless steel or PVC slug to displace water within the well or by removing water from the well with a bailer or pump. The recovery of the initial water level is then measured with respect to time. Data obtained using this test will be evaluated using procedures presented in "The Bouwer and Rice Slug Test - An Update", Bouwer, H., Groundwater Journal, Vol. 27, No. 3, May-June 1989, or similar method.

5.7 VAPOR INTRUSION INVESTIGATION

Historical records of operations within the building have indicated the use of solvent and petroleum compounds. Past vapor investigations suggest a vapor intrusion issue exists. To confirm and further assess if solvent/petroleum vapors exist in the soil beneath the building and possibly entering the building, a soil vapor intrusion investigation will be undertaken.

This investigation will consist of sampling vapors that exist beneath the building slab along with sampling building indoor air. Six soil/vapor samples will be collected from six locations below the facility's sub-slab floor. The samples will be in the slab on-grade section across the slab area at locations to be determined in the field. Since water is located in the basement, only one indoor air sample will be collected from the basement area. Concurrent and co-located indoor air samples will be collected at the sub-floor sample locations to evaluate the potential for soil vapor intrusion. One outdoor air sample will be collected for background levels. The sampling will be conducted for a period of 24 hours due to the proposed residential/commercial future use and will be conducted during the heating season. The samples will be analyzed for VOCs by Environmental Protection Agency (EPA) Method TO-15.

To collect sub-slab soil/vapor samples a skid-steer mounted Geoprobe or portable drill will be used to drill through the concrete floor to install the sampling probes. Installation/sampling procedures will be in accordance with the October 2006, New York State Department of Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* and its amendments. The sub-slab sampling procedures are also provided in **Section 8.0** of **Appendix D**-Field Sampling Plan. Summa canisters will be used to collect all vapor samples. NYSDEC Category B analytical data package deliverables will be provided. Air samples to be collected are summarized in Table 1 of **Appendix C** along with QA/QC requirements. DUSRs will be completed for all samples.

5.8 BUILDING ENVIRONMENTAL CONDITION ASSESSMENT

The RI will also include: (1) an ACM survey – note, this will depend on a review of a recent survey to determine if additional survey is necessary; (2) a LBP survey; and (3) a PCB inventory/assessment for the building.

ACM Survey

A recent asbestos survey was completed on the property. This survey will be reviewed to assess its applicability. If additional asbestos assessment is necessary, AMD Environmental Consultants, Inc. (NYS DOL # 56177), under subcontract to BE3, will provide New York State Department of Labor Certified Asbestos Inspectors to identify and quantify homogenous areas, and to collect bulk samples of each homogenous area within the building for laboratory analysis. Asbestos sampling activities will be conducted in accordance with guidelines and techniques identified in New York Code Rule 56. The samples will be sent to a laboratory approved by NYSDOH ELAP for subsequent analysis.

Layered building materials will be separated by layer into individual homogenous areas. The sampling event will include a visual examination to identify the location, approximate quantities, apparent condition, and friability of materials that are typically suspected to contain asbestos as identified in 12 NYCRR 56-5.1.

Bulk samples will be laboratory analyzed for the presence of asbestos, using polarized light microscopy (PLM). Samples that are determined by the laboratory to be non-friable organically bound (NOB) in nature and determined to contain less than one percent asbestos by PLM analysis, will also be analyzed by transmission electron microscopy (TEM). TEM analysis is required by the NYSDOH to conclusively determine that NOB materials contain less than one percent asbestos. An asbestos survey report will be completed for inclusion in the RI report.

LEAD INSPECTION

BE3/AMD will provide EPA certified LBP Risk Assessors/Environmental Technicians to perform a LBP inspection of the interior and exterior surfaces of the subject building using X-

Ray Fluorescence (XRF) analyzer. Surfaces will be classified as LBP using HUD criteria which defines LBP as any paint, varnish, stain or other applied coating measuring 1.0 mg/cm^2 or 0.5 percent by weight or more of lead. All surfaces yielding inconclusive results during the XRF inspection shall be assumed positive for LBP. A report documenting the results of the LBP survey will be developed and included in the RI report.

PCB SURVEY

BE3/AMD will provide Environmental Technicians to identify transformer oils, lubricating oils, window caulks, and fluorescent light fixtures for suspect PCB containing materials and collect verification samples. The samples will be submitted to an accredited laboratory to determine the presence of PCBs and compare against existing EPA standards. The survey will also investigate lighting ballasts for PCB related labelling and provide a count of fixtures that are not labelled as being non-PCB containing. A report will be developed for inclusion in the RI report.

FLOOR DRAIN SURVEY

A survey of the building floor drains will be identified and characterized.

6.0 ADDITIONAL SUPPLEMENTAL FIELD INVESTIGATIONS

All the data generated during the RI will be evaluated to determine if additional investigation activities are needed beyond what is described herein. Additional assessment may include an additional subsurface boring or test trench and sample analysis limited to contaminants identified during the RI program. Should the site investigations indicate the likelihood of site contaminants leaching outside the Site boundary, additional assessment for potential off-site soil vapor intrusion may be necessary.

7.0 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste (IDW) will include soil, groundwater, and miscellaneous solid waste generated on site. The soil and groundwater generated on site that cannot be disposed of on site will be containerized and disposed of at an approved facility. IDW will be managed in accordance with NYSDEC DER-10 Section 3.3e.

8.0 QUALITATIVE EXPOSURE ASSESSMENT

Qualitative exposure assessments will be completed in accordance with DER-10 sections 3.3(c) 3 & 4. The assessments will include what impacts site contaminates and field activities may have, if any, on human health and fish and wildlife resources considering all media (ground/surface water, soil, soil vapor, ambient air, and biota).

The qualitative human health exposure assessment will evaluate the five elements (DER-10 Appendix 3B) associated with exposure pathways and describe how each of these elements pertains to the Site. The exposure pathway elements that will be addressed include:

- A description of the contaminant source(s) including the location of the contaminant release to the environment (any waste disposal area or point of discharge) or if the

original source is unknown, the contaminated environmental medium (soil, indoor or outdoor air, biota, and water) at the point of exposure;
- An explanation of the contaminant release and transport mechanisms to the exposed population;
- Identification of all potential exposure point(s) where actual or potential human contact with a contaminated medium may occur;
- Description(s) of the route(s) of exposure (i.e., ingestion, inhalation, dermal absorption); and,
- A characterization of the receptor populations who may be exposed to contaminants at a point of exposure.

As called for in DER-10 for volunteers in the BCP, sufficient field information and sampling data will be provided to identify the presence of contamination, if any, that maybe leaving the Site to support qualitative off-site exposure assessments by others.

9.0 REPORTING

An RI report will be prepared in accordance with the applicable requirements of DER-10 and Part 375. A schedule is provided in **Figure 2**. It is anticipated that upon completion of the 30-day public comment period an RI report will be drafted. This report may also include a corresponding AAR that (1) evaluates remedial alternatives based upon the data obtained in the RI, and (2) initiates the 45-day public comment period for the generation of the remedial action work plan (RAWP) and final decision document produced by the NYSDEC.

A Citizen Participation Plan (CPP) has been prepared for the Site in accordance with the requirements outlined in NYSDEC's DER-23 Citizen Participation Handbook for Remedial Programs, issued January 2010, as amended. The CPP provides for issuance of fact sheets and public meetings at various stages in the investigation/remedial process. A fact sheet will be prepared by NYSDEC to announce the availability of the RIWP for review, followed by a 30-day comment period. A public meeting will be held, if requested, during the public comment period. A copy of this RIWP will be made available for public review at Lockport Library, 23 East Avenue, Lockport, New York, and an announcement will be issued in the Environmental Notice Bulletin.

The major components of the CPP are as follows:

- Names and addresses of the interested public as set forth on the Brownfield site contact list provided with the BCP application;
- Identification of major issues of public concern related to the site and that may be encountered during the remediation project;
- A description of citizens participation activities already performed and to be performed during remediation;
- Identification of document repositories for the project; and,
- A description and schedule of public participation activities that are either required by law or needed to address public concerns related to the Site.

Summaries of the RI investigation will be submitted to the NYSDEC as monthly progress reports as noted in Section XI of the BCA. Fact sheets documenting the goals and progress of the project will be prepared at key milestones during the project and distributed to those on the project mailing list. The distribution list is included in the CPP, which is provided in **Appendix D.**

10.0 WORK PLAN CERTIFICATION

Peter J. Gorton and Jason M. Brydges certify that we are currently New York State registered professional engineers/Qualified Environmental Professionals as defined in 6 NYCRR Part 375 and that this Remedial Investigation 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).

Peter J. Gorton

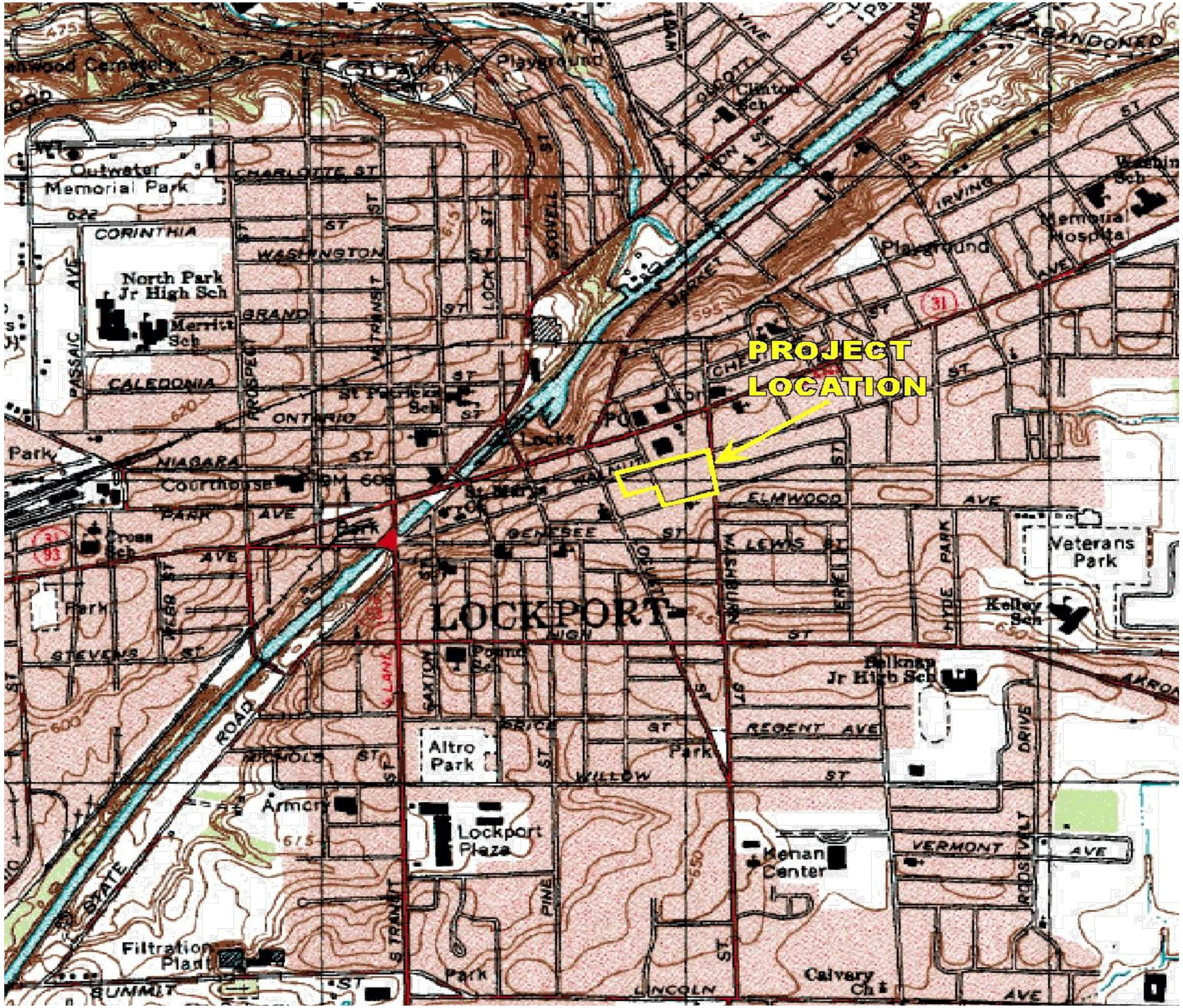
Peter J. Gorton, MPH, CHCM

Jason M. Brydges

Jason M. Brydges, PE

FIGURES

BRYDGES ENGINEERING IN ENVIRONMENT & ENERGY



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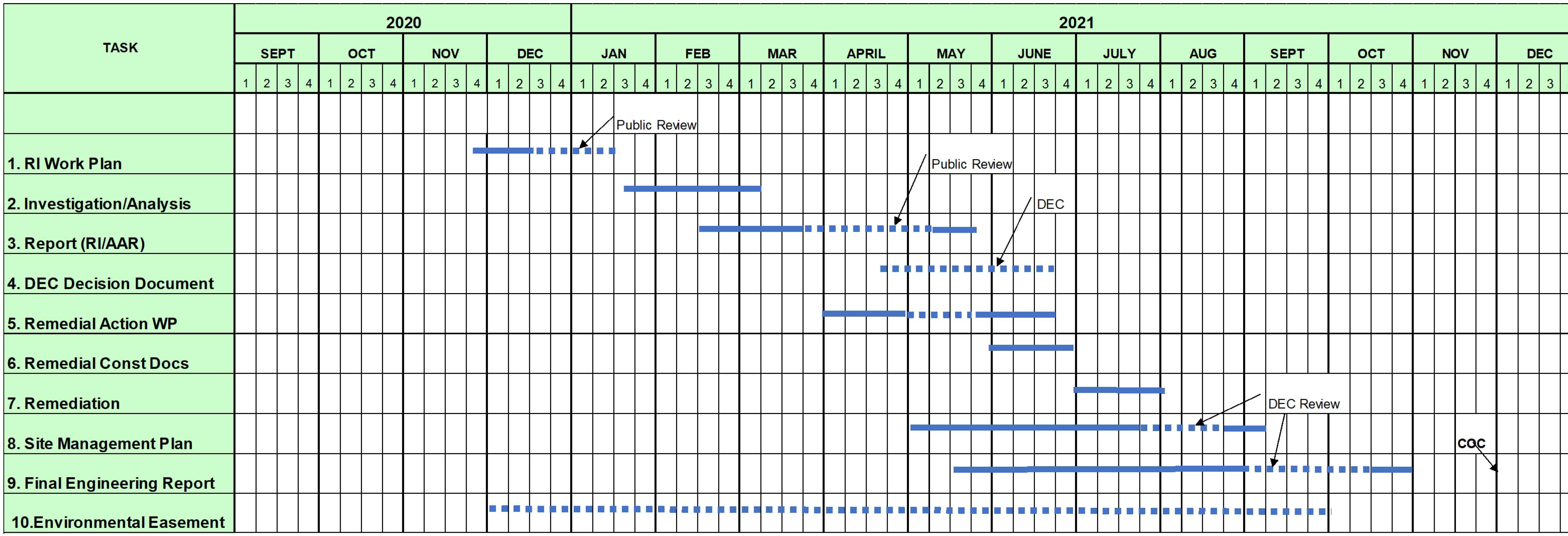
960 Busti Avenue
Suite B150
Buffalo, NY 14213
P: 716-362-6532

Figure 1
Site Location Map

Harrison Place
210 Walnut Street
Lockport, New York 14094

Revisions

12-08-2020 | SCALE: N/A | SHEET 1 OF 1



(1) - Assumes a 2021 COC required.

N

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Figure 2
BCP Project Schedule

Harrison Place
210 Walnut Street
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Revisions

12-08-2020 | SCALE: N/A | SHEET 1 OF 1

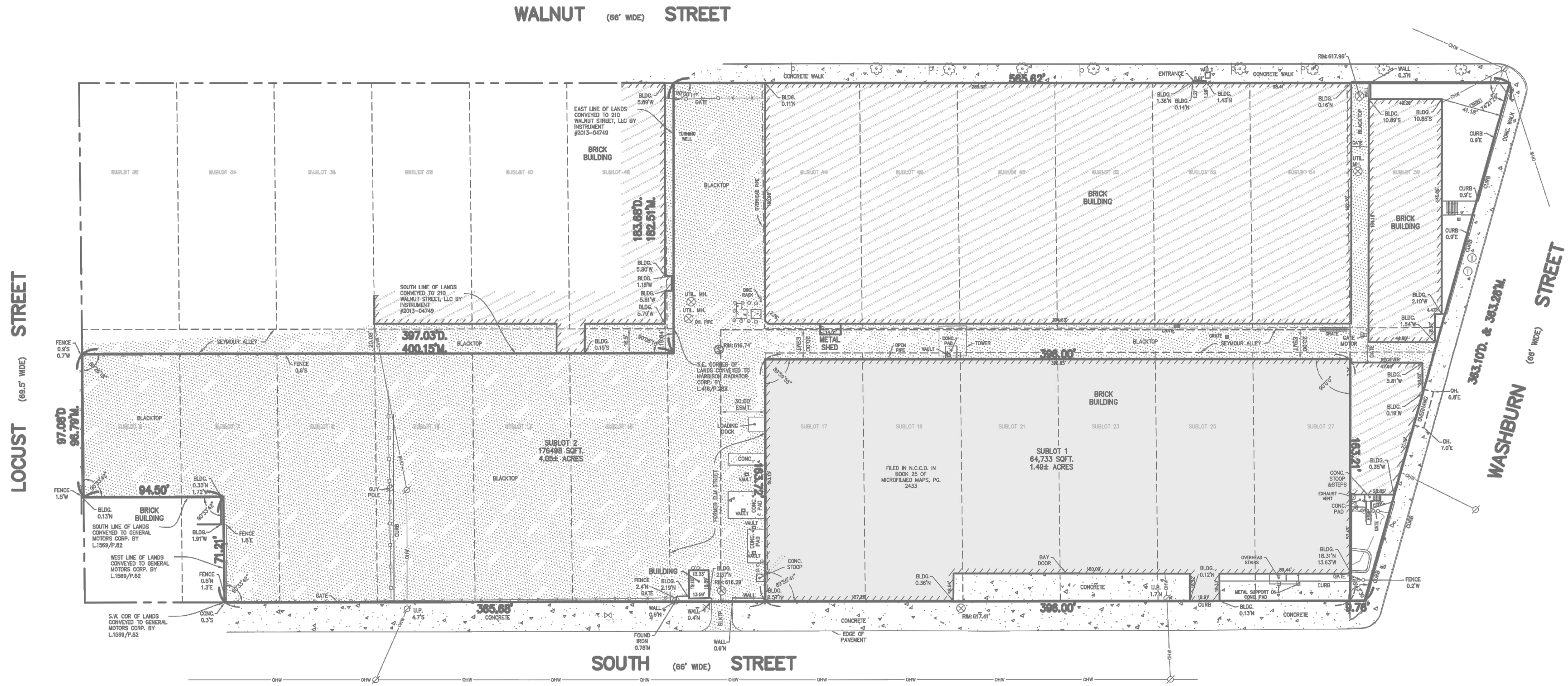

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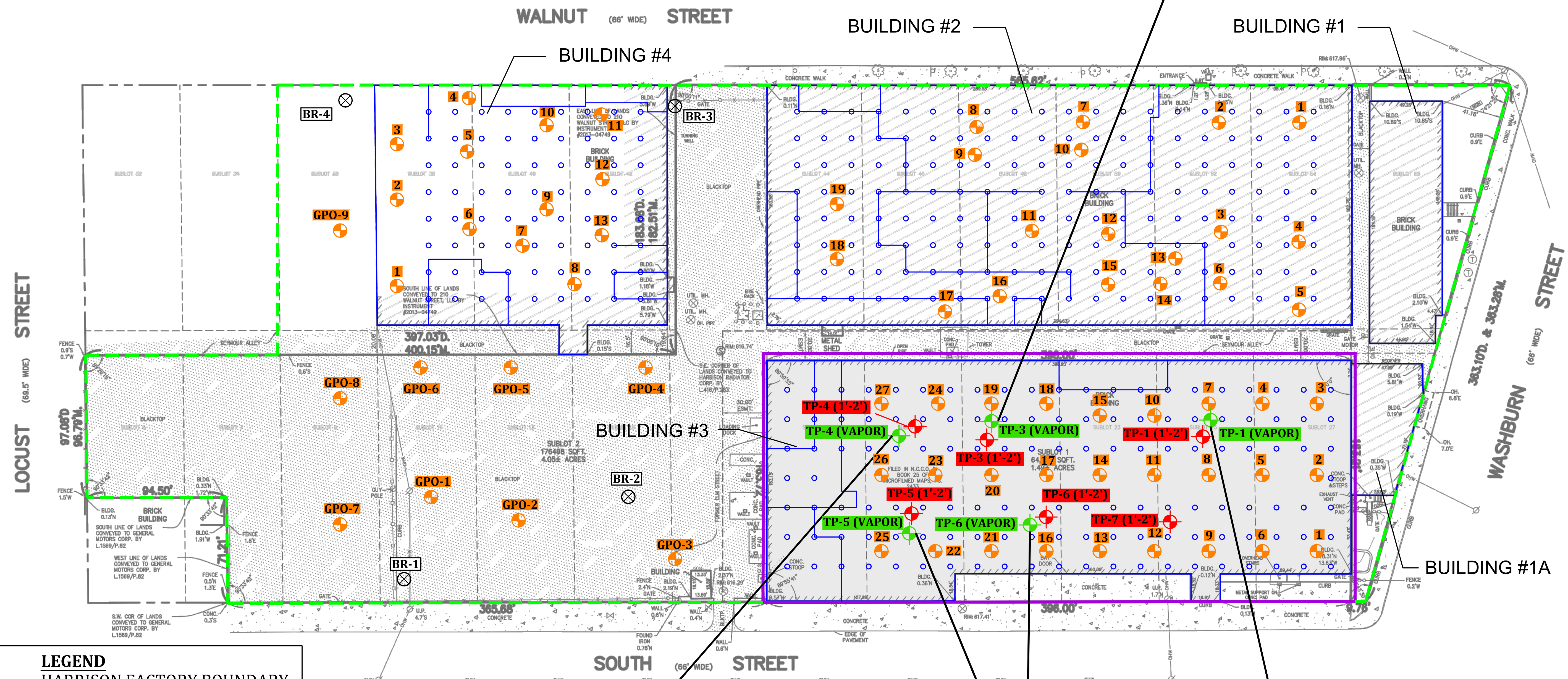
Figure 3
Site Survey Details

Harrison Place
210 Walnut Street
Lockport, New York 14094

12-08-2020	SCALE: N/A	SHEET 1 OF 1

Revisions

TP-3 (Vapor)	
PCE	2310
TCE	607
cDCE	6.38



TP-4 (Vapor)	
PCE	301
TCE	65.2
cDCE	19.5

TP-5 (Vapor)	
PCE	480
TCE	505
cDCE	0.92

TP-6 (Vapor)	
PCE	307
TCE	1040
cDCE	9.99

TP-1 (Vapor)	
PCE	29.5
TCE	259.0
cDCE	82.4

LEGEND

- HARRISON FACTORY BOUNDARY
- BCP SITE BOUNDARY
- BUILDING OUTLINE
- INTERIOR BUILDING COLUMNS
- GPO-# / # D.E.C. ENVIRONMENTAL SOIL BORING
- BR-# D.E.C. ENVIRONMENTAL MONITORING WELL
- TP-# JADE ENVIRONMENTAL TEST PROBE (SOIL)
- TP-# JADE ENVIRONMENTAL TEST PROBE (VAPOR)

N

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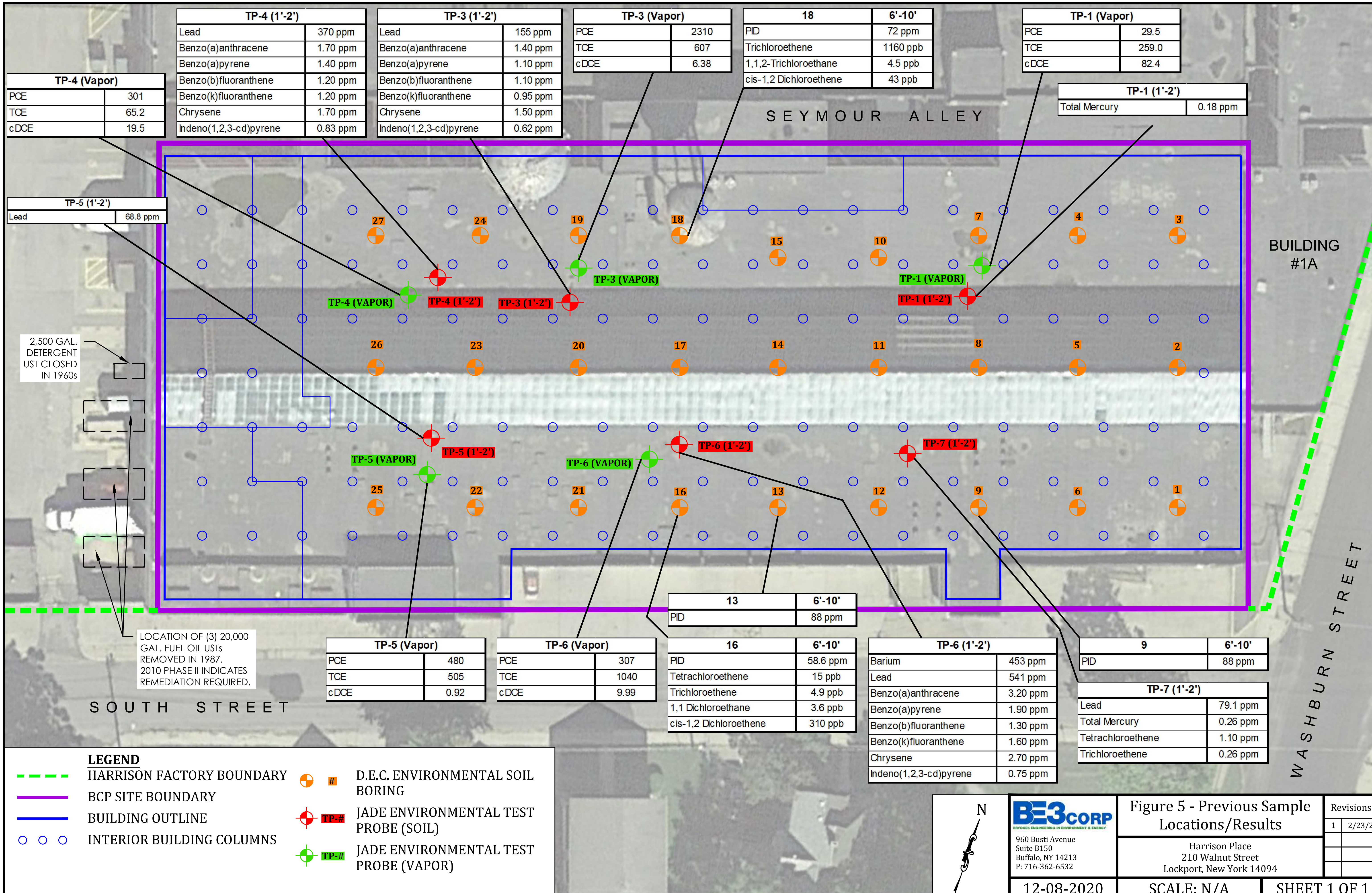
Figure 4 - Previous Sample Locations/Results

Harrison Place
210 Walnut Street
Lockport, New York 14094

Revisions

12-08-2020 | SCALE: N/A | SHEET 1 OF 1



TP-4 (Vapor)	
PCE	301
TCE	65.2
cDCE	19.5

TP-4 (1'-2')	
Lead	370 ppm
Benzo(a)anthracene	1.70 ppm
Benzo(a)pyrene	1.40 ppm
Benzo(b)fluoranthene	1.20 ppm
Benzo(k)fluoranthene	1.20 ppm
Chrysene	1.70 ppm
Indeno(1,2,3-cd)pyrene	0.83 ppm

TP-3 (1'-2')	
Lead	155 ppm
Benzo(a)anthracene	1.40 ppm
Benzo(a)pyrene	1.10 ppm
Benzo(b)fluoranthene	1.10 ppm
Benzo(k)fluoranthene	0.95 ppm
Chrysene	1.50 ppm
Indeno(1,2,3-cd)pyrene	0.62 ppm

TP-3 (Vapor)	
PCE	2310
TCE	607
cDCE	6.38

18	6'-10'
PID	72 ppm
Trichloroethene	1160 ppb
1,1,2-Trichloroethane	4.5 ppb
cis-1,2 Dichloroethene	43 ppb

TP-1 (Vapor)	
PCE	29.5
TCE	259.0
cDCE	82.4

TP-1 (1'-2')	
Total Mercury	0.18 ppm

TP-5 (1'-2')	
Lead	68.8 ppm

13	6'-10'
PID	88 ppm

TP-5 (Vapor)	
PCE	480
TCE	505
cDCE	0.92

TP-6 (Vapor)	
PCE	307
TCE	1040
cDCE	9.99

16	6'-10'
PID	58.6 ppm
Tetrachloroethene	15 ppb
Trichloroethene	4.9 ppb
1,1 Dichloroethane	3.6 ppb
cis-1,2 Dichloroethene	310 ppb

TP-6 (1'-2')	
Barium	453 ppm
Lead	541 ppm
Benzo(a)anthracene	3.20 ppm
Benzo(a)pyrene	1.90 ppm
Benzo(b)fluoranthene	1.30 ppm
Benzo(k)fluoranthene	1.60 ppm
Chrysene	2.70 ppm
Indeno(1,2,3-cd)pyrene	0.75 ppm

9	6'-10'
PID	88 ppm

TP-7 (1'-2')	
Lead	79.1 ppm
Total Mercury	0.26 ppm
Tetrachloroethene	1.10 ppm
Trichloroethene	0.26 ppm

LEGEND

- HARRISON FACTORY BOUNDARY
- BCP SITE BOUNDARY
- BUILDING OUTLINE
- INTERIOR BUILDING COLUMNS
- # D.E.C. ENVIRONMENTAL SOIL BORING
- TP-# JADE ENVIRONMENTAL TEST PROBE (SOIL)
- TP-# JADE ENVIRONMENTAL TEST PROBE (VAPOR)

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Figure 5 - Previous Sample Locations/Results

Harrison Place
210 Walnut Street
Lockport, New York 14094

Revisions	
1	2/23/21

12-08-2020 | SCALE: N/A | SHEET 1 OF 1

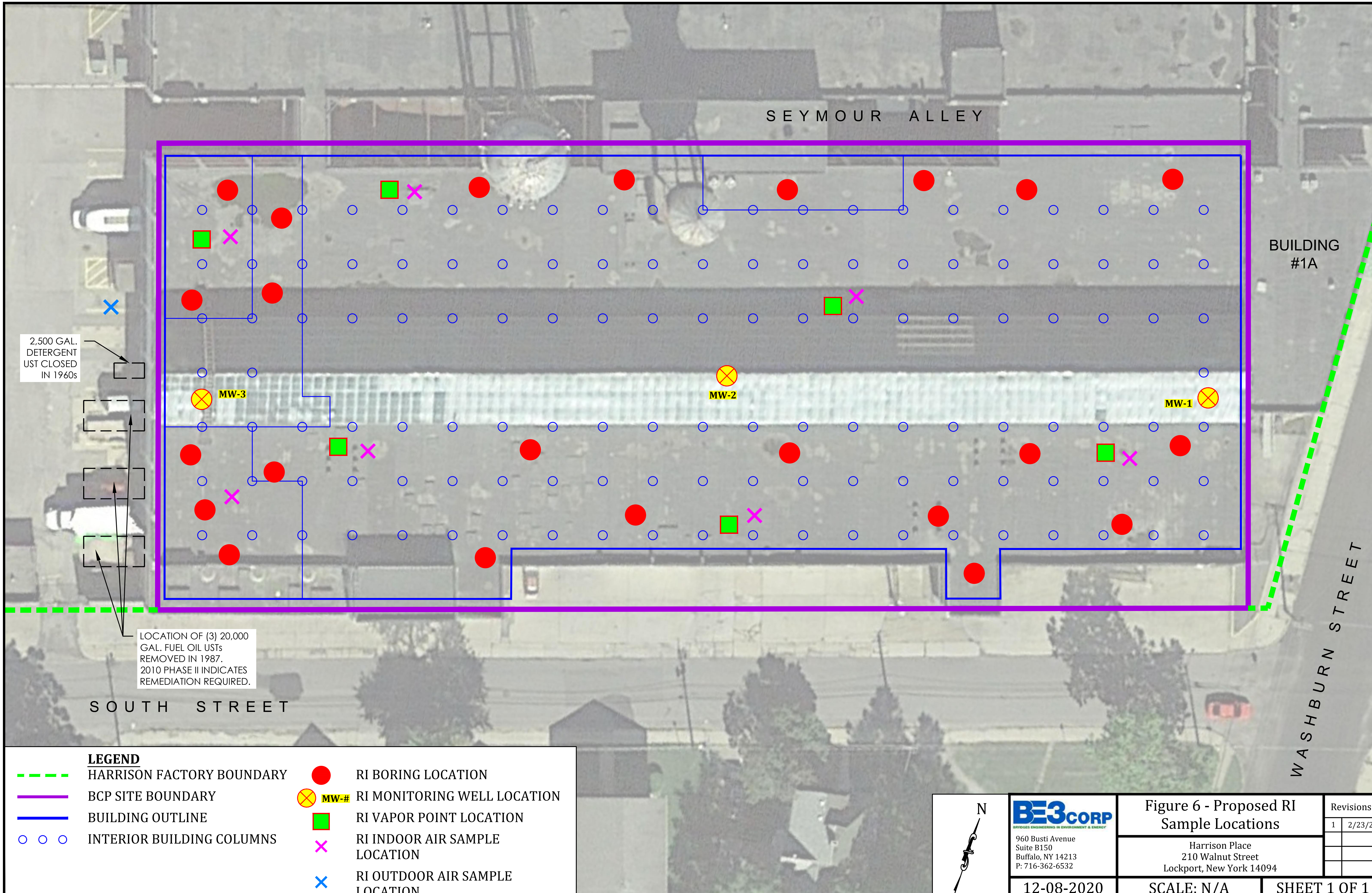

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Figure 6 - Proposed RI Sample Locations

Harrison Place
210 Walnut Street
Lockport, New York 14094

Revisions	
1	2/23/21

12-08-2020 | SCALE: N/A | SHEET 1 OF 1

APPENDIX A

HEALTH AND SAFETY PLAN

AND

COMMUNITY AIR MONITORING PROGRAM

HEALTH AND SAFETY PLAN
for
SITE INVESTIGATIONS AND REMEDIAL OVERSIGHT

Harrison Place
Northwest Corner - Intersection of South & Washburn Street
Lockport, New York
Tax Map ID No.: P/O 109.14-4-20.1
Property County: Niagara
Site No.: C932177

Prepared for:

The Kearney Realty & Development Group Inc.
57 US Route 6, Suite 207
Baldwin Place, NY 10505

Prepared by:

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960 Busti Avenue, Suite B-150
Buffalo, New York 14213

December 2020

Table of Contents

ATTACHMENTS

1.0 INTRODUCTION

The following health and safety procedures apply to Brownfield Cleanup Program (BCP) project personnel, including subcontractors, performing activities described in the Release Investigation Work Plan (RIWP). Please note, however, contractors performing remedial work are required to either develop their own Health and Safety Plans (HASPs) meeting these requirements at a minimum or adopt this plan.

1.1 PURPOSE

Directed at protecting the health and safety of the field personnel during field activities, the following HASP was prepared to provide safe procedures and practices for personnel engaged in conducting the field activities associated with this project. The plan has been developed using the Occupational Safety and Health Administration (OSHA) 1910 and 1926 regulations and New York State Department of Environmental Conservation (NYSDEC) Brownfields Department of Environmental Remediation (DER)-10 as guidance. The purpose of this HASP is to establish personnel protection standards and mandatory safety practices and procedures for this task specific effort. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise during the field efforts.

1.2 APPLICABILITY

The provisions of the plan are mandatory for all personnel engaged in field activities. All personnel who engage in these activities must be familiar with this plan and comply with its requirements. The plan is based on available information concerning the project area and planned tasks. If more data concerning the project area becomes available that constitute safety concerns, the plan will be modified accordingly. A member of each contractor on the BCP project will be designated as Field Safety Officer and will be responsible for field safety. Any modifications to the plan will be made by the Field Safety Officer after discussion with the Project Manager and Health and Safety Officer. All modifications will be documented and provided to the Project Manager and the Health and Safety Officer for approval. A copy of this plan will be available to all on-site personnel, including subcontractors prior to their initial entry onto the site.

Before field activities begin, all personnel will be required to read the plan. All personnel must agree to comply with the minimum requirements of this plan, be responsible for health and safety, and sign the Statement of Compliance before site work begins.

1.3 FIELD ACTIVITIES

The work addressed by this HASP includes remedial investigation (RI) activities such as assessment of subsurface conditions related to soil and groundwater and oversight activities related to remediation. Field work will be conducted that can include soil borings, monitoring well installation, groundwater and soil sampling, etc.

1.4 PERSONNEL REQUIREMENTS

Key personnel are as follows:

Health and Safety Officer - Peter J. Gorton, MPH, CHCM – Masters Level
Engineer and Project Manager – Jason M Brydges, P.E. and Jake Tracy, EIT
Geologist – John Boyd, PG
Technicians – Jesse Zientek and Dalton Stack
QA/QC – John Berry, P.E.

Responsibilities of some of the key personnel are as follows:

Project Manager:

- Assuring that personnel are aware of the provisions of the HASP and are proficient in work practices necessary to ensure safety and in emergencies;
- Verifying that the provisions of this plan are implemented;
- Assuring that appropriate personnel protective equipment (PPE), if necessary, is available and properly utilized by all personnel;
- Assuring that personnel are aware of the potential hazards associated with Site operations;
- Supervising the monitoring of safety performance by all personnel and ensuring that required work practices are employed; and,
- Maintaining sign-off forms and safety briefing forms.

Health and Safety Officer:

- Monitoring work practices to determine if potential hazards are present, such as heat/cold stress, safety rules near heavy equipment, etc.;
- Determining changes to work efforts or equipment to ensure the safety of personnel;
- Evaluating on-site conditions and recommend to the Project Manager modifications to work plans needed to maintain personnel safety;
- Determining that appropriate safety equipment is readily available and monitor its proper use;
- Stopping work if unsafe conditions occur or if work is not being performed in compliance with this plan:
- Monitoring personnel performance to ensure that the required safety procedures are followed.
- Documenting incident and reporting to Project Manager within 48 hours of occurrence if established safety rules and practices are violated; and,
- Conducting safety meetings as necessary.

Field Personnel, including geologists and technicians:

- Understanding the procedures outlined in this plan;
- Taking precautions to prevent injury to themselves and co-workers;
- Performing only those tasks believed to be safe;

- Reporting accidents or unsafe conditions to the Health and Safety Officer and Project Manager;
- Notifying the Health and Safety Officer and Project Manager of special medical problems (e.g., allergies, medical restrictions, etc.);
- Thinking about safety first while conducting field work; and,
- Not eating, drinking or smoking in work areas.

All Site personnel have the authority to stop work if conditions are deemed to be unsafe. Visitors will be required to report to the overall Site Project Manager or designee and follow the requirements of this plan and the Contractor's HASP (if different).

2.0 SITE DESCRIPTION AND SAFETY CONCERNS

2.1 SITE BACKGROUND AND DESCRIPTION

The Commerce Square site was used from 1914 to 1987 by the Harrison Radiator Division of General Motors Corporation. The facility was used for the manufacture of copper and brass automobile parts including thermostats, vacuum and electrical switches, modulators, and heat exchangers. Processes reportedly included: metal pressing; metal stamping and forming; metal finishing and assembly; tin and lead soldering and brazing; parts washing and degreasing; injection molding; painting; heat treating; tool design; and quality control testing. At the time of plant closure, most of the equipment, materials, and other items were reportedly removed and either sold or transferred to another Harrison Radiator facility. It is currently used to store miscellaneous items.

2.2 HAZARD EVALUATION

Specific health and safety concerns to the project tasks include working around low levels of heavy metals, semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs) in soil and groundwater. Physical hazards include those associated with working near open excavations and adjacent to field equipment. Contractors will have separate detailed health and safety procedures/requirements for excavations and the transportation and disposal of impacted material that will meet or exceed requirements in this plan. A table of potential hazards and OSHA Standards for consideration during investigation and remedial activities is provided in **Attachment 1**.

2.2.1 Chemical Hazards

Chemical hazards detected at the site include metals and organic compounds that were detected in soil samples and groundwater at concentrations that exceed NYSDEC Part 375 soil cleanup objectives or groundwater standards. These compounds could be encountered during the RI and remedial activities and potential routes of exposure include:

- Skin contact;
- Inhalation of vapors or particles;
- Ingestion; and,
- Entry of contaminants through cuts, abrasions or punctures.

The anticipated levels of personnel protection will include Level D PPE that includes the following:

1. Long sleeve shirt and long pants
2. Work boots with steel toe
3. Hard hats when heavy equipment or overhead hazards are present
4. Safety glasses
5. Work gloves and chemical resistant gloves when sampling potentially contaminated materials
6. High visibility vests or outer gear when Site traffic is significant

Modifications may include booties, overalls, hearing protection, or respiratory protection if air monitoring levels indicate sustained photoionization detector (PID) readings greater than 5 ppm above established background levels. If these levels are reached, work will be halted pending discussions with field and office management. If any readings are recorded above background, work will proceed with caution and breathing zone monitoring will be conducted.

2.2.2 Other Physical Hazards

Depending on the time of year, weather conditions or work activity, some of the following physical hazards could result from project activities:

- Noise
- Heat Stress
- Cold Stress
- Slips, trips, and falls
- Exposure to moving machinery during drilling and excavation activities
- Physical eye hazards
- Lacerations and skin punctures
- Back strain from lifting equipment
- Electrical storms and high winds
- Contact with overhead or underground utilities

Slips, Trips, and Falls. Field personnel shall become familiar with the general terrain and potential physical hazards that is associated with the risk of slips, trips, and falls. Special care shall be taken when working near demolition and excavation operations and material stockpiles. Workers will observe all pedestrian and vehicle rules and regulations. Extra caution will be observed while working near roadways and while driving in reverse to ensure safety.

Noise. All personnel shall wear hearing protection devices, such as earmuffs or ear plugs, if work conditions warrant. These conditions would include difficulty hearing while speaking to one another at a normal tone within three feet. If normal speech is interfered with due to work noise, the Health and Safety Officer or designee will mandate the use of hearing protection or other noise-producing equipment or events.

Heat/Cold Stress. Heat stress work modification may be necessary during ambient temperatures of greater than 29 degrees Celsius (°C) (85 degrees Fahrenheit [°F]) while wearing normal clothing or exceeding 21°C (70°F) while wearing PPE. Because heat stress is one of the most common and potentially serious illnesses at work sites, regular monitoring and preventive measures will be utilized such as additional rest periods, supplemental fluids, restricted consumption of drinks containing caffeine, use of cooling vests, or modification of work practices. Most of the work to be conducted during the oversight and monitoring operations is expected to consist of light manual labor and visual observation. Given the nature of the work and probable temperatures, heat stress hazards are not anticipated. See **Attachment 2** for heat stress management procedures.

If work is to be conducted during winter conditions, cold stress may be a concern to the health and safety of personnel. Wet clothes combined with cold temperatures can lead to hypothermia. If air temperature is less than 4°C (40°F) and a worker perspires, the worker should change to dry clothes. The following summary of the signs and symptoms of cold stress are provided as a guide for field personnel.

1. Incipient frostbite is a mild form of cold stress characterized by sudden blanching or whitening of the skin.
2. Chilblain is an inflammation of the hands and feet caused by exposure to cold moisture. It is characterized by a recurrent localized itching, swelling, and painful inflammation of the fingers, toes, or ears. Such a sequence produces severe spasms, accompanied by pain.
3. Second-degree frostbite is manifested by skin with a white, waxy appearance and the skin is firm to the touch. Individuals with this condition are generally not aware of its seriousness because the underlying nerves are frozen and unable to transmit signals to warn the body. Immediate first aid and medical treatment are required.
4. Third-degree frostbite will appear as blue blotchy skin. The tissue is cold, pale, and solid. Immediate medical attention is required.
5. Hypothermia develops when body temperature falls below a critical level. In extreme cases, cardiac failure and death may occur. Immediate medical attention is warranted when the following symptoms are observed:

   - Involuntary shivering
   - Irrational behavior
   - Slurred speech
   - Sluggishness

Fire and Explosion. These hazards will be minimal for activities associated with this project. All heavy equipment will be equipped with a fire extinguisher.

Trenching and Excavations. There are a variety of potential health and safety hazards associated with excavations. These include:

- Surface encumbrances, such as structures, fencing, stored materials, etc.;
- Below- and above-ground utilities, such as water and sewer lines, gas lines, telephone lines, and optical cable lines, etc.;
- Overhead power lines and other utilities;
- Vehicle and heavy equipment traffic around the excavations;
- Falling loads from lifting or digging equipment;
- Water accumulation within excavations;
- Hazardous atmospheres, such as oxygen deficiency, flammable gases, and toxic gases;
- Falling into or driving equipment into unprotected or unmarked excavations; and,

- Cave-in of loose rocks and soil at the excavation face.

OSHA requirements for trenching and excavations are contained in 29 Code of Federal Regulations (CFR), Subpart P, 1926:650 through 1926.652. See **Attachment 3** for details on excavation and trenching safety requirements, which include the following basic minimum excavation requirements:

- Personnel entry into excavations should be minimized whenever possible and no entry will occur in pits greater than 4 feet below ground surface (bgs). Sloping, shoring or equivalent means should be utilized.
- Surface encumbrances such as structures, fencing, piping, stored material etc. that may interfere with safe excavations should be avoided, removed or adequately supported prior to the start of excavations. Support systems should be inspected daily.
- Underground utility locations should be checked and determined, and permits should be obtained prior to initiating excavations. Local utility companies will be contacted at least two days in advance, advised of proposed work, and requested to locate underground installations. When excavations approach the estimated location of utilities, the exact location should be determined by careful probing or hand digging and when it is uncovered, proper supports should be provided.
- A minimum safe distance of 15 feet should be maintained when working around overhead high-voltage lines or the line should be de-energized following appropriate lock-out and tag- out procedures by qualified utility personnel.
- Excavations five feet or more, if entered, will require an adequate means of exit, such as a ladder, ramp, or steps and located to require no more than 25 feet of lateral travel. Under no circumstances should personnel be exited/entered an excavation using heavy equipment.
- Personnel working around heavy equipment, or who may be exposed to public vehicular traffic should wear high visibility clothes, especially at night.
- Heavy equipment or other vehicles operating next to or approaching the edge of an excavation will require that the operator have a clear view of the edge of the excavation, or that warning systems such as barricades, hand or mechanical signals, or stop logs be used. If possible, the surface grade should slope away from the excavation.
- Personnel should be safely located in and around the trench/excavation face and should not work underneath loads handled by lifting or digging equipment.
- Hazardous atmospheres, such as oxygen deficiency (atmospheres containing less than 19.5% oxygen), flammable gases (airborne concentrations greater than 20% of the lower explosive limit), and toxic gases (airborne concentrations above the OSHA Permissible Exposure Limit or other exposure limits) may occur in excavations. Monitoring should be conducted for hazardous atmospheres prior to entry and at regular intervals. Ventilation or respiratory protection may be provided to prevent personnel exposures to oxygen deficient or toxic atmospheres. Periodic retesting (at least each shift) of the excavation will be conducted to verify that the atmosphere is acceptable. A log or field book records should be maintained.
- Personnel should not work in excavations that have accumulated water or where water is accumulating unless adequate precautions have been taken. These precautions can include shield systems, water removal systems, or safety harnesses and lifelines. Groundwater entering the excavation should be properly directed away and down gradient from the excavation.

- Safety harnesses and lifelines should be worn by personnel entering excavations that qualify as confined spaces.
- Excavations near structures should include support systems such as shoring, bracing, or underpinning to maintain the stability of adjoining buildings, walls, sidewalks, or other structures endangered by the excavation operations.
- Loose rock, soil, and spoils should be piled at least two and preferably 5 feet or more from the edge of the excavation. Barriers or other effective retaining devices may be used to prevent spoils or other materials from falling into the excavation.
- Walkways or bridges with standard guardrails that meet OSHA specifications will be provided where employees, the public, or equipment are required to cross over excavations.
- Adequate barrier physical protection should be provided, and excavations should be barricaded or covered when not in use or left unattended. Excavations should be backfilled as soon as possible when completed.
- Safety personnel should conduct inspections prior to the start of work and as needed throughout the work shift and after occurrence that increases the hazard of collapse (i.e., heavy rain, vibration from heavy equipment, freezing and thawing, etc.).
- Personnel working in excavations should be protected from cave-ins by sloping or benching of excavation walls, a shoring system or some other equivalent means in accordance with OSHA regulations. Soil type is important in the determination of the angle of repose for sloping and benching, and the design of shoring systems.

2.2.3 Biological Hazards

Biological hazards can result from encounters with mammals, insects, snakes, spiders, ticks, plants, parasites, and pathogens. Mammals can bite or scratch when cornered or surprised. The bite or scratch can result in local infection with systemic pathogens or parasites. Insect and spider bites can result in severe allergic reactions in sensitive individuals. Exposure to poison ivy, poison oak or poison sumac results in skin rash. Ticks are a vector for several serious diseases. Dead animals, organic wastes, and contaminated soil and water can harbor parasites and pathogens. These hazards are reduced if work is conducted during late fall and winter months. The following are highlighted because they represent more likely concerns for the site-specific tasks and location:

Bees, Ants, Wasps and Hornets. Sensitization by the victim to the venom from repeated stings can result in anaphylactic reactions. If a stinger remains in the skin, it should be removed by teasing or scraping, rather than pulling. An ice cube placed over the sting will reduce pain. An analgesic corticosteroid lotion is often useful. People with known hypersensitivity to such stings should consult with their doctor about carrying a kit containing an antihistamine and aqueous epinephrine in a pre-filled syringe when in endemic areas. Nests and hives for bees, wasps, hornets and yellow jackets often occur in the ground, trees and brush. Before any nests or hives are disturbed, an alternate sampling location should be selected. If the sample location cannot be relocated, site personnel who may have allergic reactions shall not work in these areas.

Ticks. The incidence of Lyme disease is correlated to outdoor workers in areas where the disease is widespread and heightened risk of encountering ticks infected with B. burgdorferi, which varies from state to state, within states, and even within counties. Preventing tick bites is of utmost importance in preventing Lyme disease and other tickborne illnesses. Tick bite prevention strategies include avoidance or clearing of tick-infested habitats and use of personal protective measures (e.g., repellents and protective clothing). Tick checks should be done regularly, and ticks should be removed promptly. If a worker in a high-risk area develops flu-like symptoms (fever, chills, muscle aches, joint pains, neck stiffness, headache) or a bulls-eye rash, they should seek medical attention even if there is no recall of a tick bite. Workers who have experienced a tick bite should remove the tick and seek medical attention if signs and symptoms of tick-borne diseases occur.

Storm Conditions. When lightening is within 10 miles of the work site, all personnel should evacuate to a safe area.

Sun. When working in the sun, personnel should apply appropriate sun screening lotions (30 sunscreen or above), and/or wear long sieve clothing and hats.

2.2.4 Activity Hazard Analysis

Table 1 presents a completed activity hazard analysis for the performance of an RI.

Table 1. Activity Hazard Analysis

PRINCIPAL STEPS	POTENTIAL SAFETY/HEALTH HAZARDS	RECOMMENDED CONTROLS
RI soil/groundwater investigation	Potential exposure to low levels of petroleum products and solvents	1. Use of administrative controls (site control and general safety rules), work cloths, dust suppression 2. Use of real-time monitoring and action levels 3. Use Physical Hazards SOPs 4. Wear gloves when handling soil and groundwater
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Excavation and other heavy equipment, Backhoe or Geoprobe	1. Daily inspection of equipment 2. Continuous safety oversight	1. Safety plan review 2. Routine safety briefings

3.0 MONITORING

The purpose of air monitoring for potential airborne contaminants is to verify that protection levels are suitable. Monitoring will be performed for dust/particulates and volatile organic compounds during excavation activities. Daily background and calibration readings will be recorded prior to the start of field activities. All monitoring equipment used during this investigation will be maintained and calibrated and records of calibration and maintenance will be kept in accordance with 29 CFR 1910.120(b)4(11)E.

3.1 Particulate Monitoring

Real-time air monitoring readings are obtained from upwind and downwind locations in accordance with DER-10 for community air-monitoring. Daily field reports will be completed that document activities performed, equipment and manpower onsite, screening and monitoring results, general Site conditions, and weather conditions.

3.2 Air Monitoring for Worker Protection

Real time air monitoring will be conducted whenever site soils are disturbed during sampling, excavation, grading, etc. A real time personal aerosol monitor (i.e., TSI SidePak AM5 10 Personal Aerosol monitor or equivalent) will be used. This monitor is a laser photometer that measures data as both real-time aerosol mass-concentration and 8-hour time weighted average (TWA). The monitor will be used to measure real-time concentrations in milligrams per meter cubed (mg/m^3). Action levels are based on potential exposure to calcium carbonate and will be as follows:

- 15 mg/m^3 total dust
- 5 mg/m^3 respirable fraction for nuisance dusts

Dust suppression techniques should be employed prior to exceeding the action levels. However, if these levels are exceeded, then work will be halted, and additional dust suppression techniques employed until safe levels are reached.

3.3 Total Volatile Organics Monitoring

Monitoring of VOCs will be conducted using a PID. If a sustained reading of 5 ppm above background occurs, then work will be halted, and personnel will evacuate the work area. Levels will be allowed to stabilize, and another reading will be taken in the breathing zone. If background levels continue to be exceeded, then work will not continue at that location and the project manager will be notified of the situation. Action levels will remain the same.

4.0 SAFE WORKING PRACTICES

The following general safe work practices always apply to a construction site:

- Eating, drinking, chewing gum or tobacco and smoking are prohibited within the work area.
- Contact with potentially contaminated substances should be avoided.
- Puddles, pools, mud, etc. should be avoided if possible.
- Kneeling, leaning, or sitting on equipment or on the ground should be avoided if possible.
- Upon leaving the work area, hands, face and other exposed skin surfaces should be thoroughly washed.
- Unusual site conditions shall be promptly conveyed to the project manager, health and safety officer, or site superintendent for resolution.

- A first-aid kit shall be available at the site.
- Field personnel should use all their senses to alert themselves to potentially dangerous situations (i.e., presence of strong, irritating, or nauseating odors).
- If severe dusty conditions are present, then soils will be dampened to mitigate dust.
- All equipment will be cleaned before leaving the work area.
- Field personnel must attend safety briefings and should be familiar with the physical characteristics of the investigation, including:
    - Accessibility to personnel, equipment, and vehicles.
    - Areas of known or suspected contamination.
    - Site access.
    - Routes and procedures to be used during emergencies.
- Personnel will perform all investigation activities with a “buddy” who is able to:
    - Provide his or her partner with assistance.
    - Notify management or emergency personnel if needed.
- Excavation activities shall be terminated immediately in event of thunder or electrical storm.
- The use of alcohol or drugs at the site is strictly prohibited.

5.0 PERSONAL SAFETY EQUIPMENT AND SITE CONTROL

5.1 PERSONAL SAFETY EQUIPMENT

As required by OSHA in 29 CFR 1920.132, this plan constitutes a workplace hazard assessment to select PPE to perform the site investigation. The PPE to be donned by on-site personnel during this investigation are those associated with the industry standard of Level D. Protective clothing and equipment to initiate the project will include:

- Work clothes, pants and long sleeves
- Work boots with steel toe
- Work gloves as necessary
- Hard hat if work is conducted near equipment
- Safety glasses
- Hearing protection as necessary

Modifications may include chemically resistant gloves, booties, and overalls. If air monitoring indicates levels are encountered that require respiratory protection (sustained readings at or above action levels above a daily established background), then work will be halted, and an adequate resolution of PPE will be made by the health and safety manager, field manager, and project manager.

5.2 SITE CONTROL

Site control will be established near each work zone by the Contractor. The purpose is to control access to the immediate work areas from individuals not associated with the project. All work zones will be fenced off with controlled access and appropriately designated as an exclusion area.

Each excavation or drilling area where heavy equipment is being utilized will be set up as a work zones and include an exclusion area and support zone. Exact configuration of each zone is dependent upon location, weather conditions, wind direction and topography. The Contractor's safety manager will establish the control areas daily at each excavation.

An area of 10 feet (as practical) around each excavation will be designated as the exclusion area. This is the area where potential physical hazards are most likely to be encountered by field personnel. The size of the exclusion area may be altered to accommodate site conditions and the drilling/excavation location. If levels of protection higher than Level D are used, this plan will be modified to include decontamination procedure. The Site excavation contractor will be required to have eye/face wash equipment/means available on-site.

A support area will be defined for each field activity where support equipment will be located. Normal work clothes are appropriate within this area. The location of this area depends on factors such as accessibility, wind direction (upwind of the operation.), and resources (i.e., roads, shelter, utilities). The location of this zone will be established daily. Excavation areas will be filled or secured (fencing) to prevent access from the public.

6.0 EMERGENCY INFORMATION

In the event of an emergency, the field personnel or the health and safety manager will employ emergency procedures. A copy of emergency information will be kept in the field and will be reviewed during the initial site briefing. Copies of emergency telephone numbers and directions to the nearest hospital will be prominently posted in the field.

6.1 MEDICAL TREATMENT AND FIRST AID

A first aid kit adequate for anticipated emergencies will be maintained in the field. If any injury should require advanced medical assistance, emergency personnel will be notified, and the victim will be transported to the hospital. The Contractor will establish his own first aid station and details will be provided in his HASP.

In the event of an injury or illness, work will cease until the field safety and oversight inspector has examined the cause of the incident and taken appropriate corrective action. Any injury or illness, regardless of extent, is to be reported to the project manager and health and safety officer.

6.2 EMERGENCY CONTACTS

Emergency telephone numbers will be posted in the field and are listed below:

- Ambulance, Fire, Police 911
- Poison Control Center 800-222-1222
- NYSDEC Spills Hotline 800-457-7362
- Jason M. Brydges, BE3 716-830-8636
- Joshua M. Vaccaro, NYSDEC PM 716 851-7220
- TBD, NYSDOH 518-402-7860
- Lockport Memorial Hospital (**716) 514-5700** See **Attachment 4**.

Verbal communications between workers or use of a vehicle horn repeatedly at intervals of three short beeps shall be used to signal all on-site personnel to immediately evacuate the area and report to the vehicle parking area.

6.3 Emergency Standard Operating Procedures

The following standard operating procedures are to be implemented by on-site personnel in the event of an emergency. The health and safety manager and Contractor's field manager shall manage response actions.

1. Upon notification of injury to personnel, the designated emergency signal shall be sounded. All personnel are to terminate their work activities and assemble in a safe location. The emergency facility listed above shall be notified. If the injury is minor, but requires medical attention, the Contractor's field manager or the health and safety manager shall accompany the victim to the hospital and help in describing the circumstances of the accident to the attending physician.
2. Upon notification of an equipment failure or accident, the Contractor's field manager or the health and safety manager shall determine the effect of the failure or accident on site operations. If the failure or accident affects the safety of personnel or prevents completion of the scheduled operations, all personnel are to leave the area until the situation is evaluated, and appropriate actions taken.
3. Upon notification of a natural disaster, such as tornado, high winds, flood, thunderstorm or earthquake, on-site work activities are to be terminated and all personnel are to evacuate the area.

6.4 Emergency Response Follow-Up Actions

Following activation of an emergency response, the health and safety officer shall notify the project manager, and the Contractor's field manager shall submit a written report documenting the incident to the project manager.

6.5 Medical Treatment

The Contractor's field manager shall be informed of any site-related injury, exposure or medical condition resulting from work activities. All personnel are entitled to medical evaluation and treatment in the event of a site accident or incident.

6.6 Site Medical Supplies and Services

The Contractor's field manager or a trained first aid crew member shall evaluate all injuries at the site and render emergency first-aid treatment, as appropriate. If an injury is minor but requires professional medical evaluation, the field manager shall escort the employee to the appropriate emergency room. For major injuries occurring at the site, emergency services shall be requested. A first-aid kit shall be readily accessible, fully supplied, and maintained at specified locations used for on-site operations.

6.7 Precautions

Universal precautions shall be followed on-site that consist of treating all human blood and certain body fluids as being infected with Human Immune Deficiency Virus (HIV), Hepatitis B virus (HBV), or other blood borne pathogens. Clothing and first-aid materials visibly contaminated with blood or other body fluids will be collected and placed into a biohazard bag. Individuals providing first aid or cleanup of blood- or body-fluid contaminated items should wear latex gloves. If providing CPR, a one-way valve CPR device should be used. Biohazard bags, latex gloves, and CPR devices will be included in the site first-aid kits.

Work areas visibly contaminated with blood or body fluids shall be cleaned using a 1:10 dilution of household bleach. If equipment becomes contaminated with blood or body fluids, and can not be sufficiently cleaned, the equipment shall be placed in a plastic bag and sealed. Any personnel servicing the equipment shall be made aware of the contamination, so that proper precautions can be taken.

7.0 RECORDKEEPING

The Contractor's field manager and health and safety officer are responsible for site record keeping. Prior to the start of work, they will review this Plan along with the Contractor's HASP. A Site safety briefing will be completed prior to the initiation of field activities. This shall be recorded in the field logbook. An accident report should be completed by the Field Manager if an accident occurs and forwarded to the project manager.

8.0 PERSONNEL TRAINING REQUIREMENTS

8.1 Initial Site Briefing

Prior to site entry, the Contractor's health and safety manager shall provide all personnel (including site visitors) with site-specific health and safety training. A record of this training shall be maintained. This training shall consist of the following:

- Discussion of the elements contained within this plan
- Discussion of responsibilities and duties of key site personnel
- Discussion of physical, biological and chemical hazards present at the site
- Discussion of work assignments and responsibilities
- Discussion of the correct use and limitations of the required PPE
- Discussion of the emergency procedures to be followed at the site
- Safe work practices to minimize risk
- Communication procedures and equipment
- Emergency notification procedures

8.2 Daily Safety Briefings

The Contractor's health and safety manager will determine if a daily safety briefing is required. The briefing shall discuss the specific tasks scheduled for that day and the following topics:

- Specific work plans
- Physical, chemical or biological hazards anticipated
- Fire or explosion hazards
- PPE required

- Emergency procedures, including emergency escape routes, emergency medical treatment, and medical evacuation from the site
- Weather forecast for the day
- Buddy system
- Communication requirements
- Site control requirements
- Material handling requirements

9.0 COMMUNITY AIR MONITORING PROGRAM (CAMP)

A Community Air Monitoring Program (CAMP) requires real-time monitoring for VOCs and particulates (i.e., dust) at the upwind and downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The program 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 and on-site workers not directly involved with work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. A New York State Department of Health (NYSDOH) generic CAMP obtained from NYSDEC DER-10 is presented in **Attachment 5** that will be followed and adhered to for work activities that could generate dust from an impacted area.

A program for suppressing fugitive dust and particulate matter monitoring will also be conducted in accordance *NYSDEC DER-10* titled *Appendix 1B Fugitive Dust and Particulate Monitoring,* which is also provided in **Attachment 5**. The fugitive dust suppression and particulate monitoring program will be employed at the site during building demolition, IRM site remediation and other intrusive activities which warrant its use.

Both the CAMP and the fugitive dust and particulate monitoring program will be administered by the environmental engineer/consultant. Monitoring results of the CAMP will be reported to the New York State Department of Health daily for review.

ATTACHMENT 1

TABLE OF POTENTIAL HAZARDS AND OSHA STANDARDS

Potential Hazards and OSHA Standards for Consideration during IRMs

Site Exposure/Control	Potentially Applicable OSHA Standard*	
	1910 General Industry	1926 Construction
Hazard Assessmen & Employee Training	29 CFR 1910.132(d)	29 CFR 1926.21(b)
Chemical Exposure	29 CFR 1910.1000	29 CFR 1926.55
Noise Exposure	29 CFR 1910.95	29 CFR 1926.52
Sanitation	29 CFR 1910.141	29 CFR 1926.51
Wiring Methods (temporary wiring)	29 CFR 1910.305(a)(2) 29 CFR 1910.333	29 CFR 1926.405(a)(2)
Electrical Hazards		29 CFR 1926.416
Emergency Action Planning	29 CFR 1910.38	29 CFR 1926.35
Excavation	covered by 1926	29 CFR 1926 Subpart P
Confined Space Entry	29 CFR 1910.146	29 CFR 1926.21(b)(6)29 CFR 1926.353(b)
Material Handling	29 CFR Subpart N	29 CFR Subpart N29 CFR 1926.600-60229 CFR 1926.604
Building Demolition	covered by 1926	29 CFR 1926 Subpart T
Site ContaminantAbatement	29 CFR 1910.1000-1029 29 CFR 1910.1043-1052	29 CFR 1926.5529 CFR 1926.6229 CFR 1926.1101-1152
Elevated Work Surfaces	29 CFR 1910 Subpart D 29 CFR 1910 Subpart F	29 CFR 1926 Subpart L29 CFR 1926 Subpart M29 CFR 1926.552
Chemical Storage	29 CFR 1910 Subpart H29 CFR 1910.1200	29 CFR 1926.5929 CFR 1926 Subpart F
Personal Protective Equipment	29 CFR 1910 Subpart I	29 CFR 1926 Subpart E
Heavy Equipment Operation	29 CFR 1910.9529 CFR 1910 Subpart N	29 CFR 1926.5229 CFR 1926 Subpart 0
Tasks-Long Duration	29 CFR 1910.141-142	29 CFR 1926.51

The Federal General Industry and Construction citations are provided above

ATTACHMENT 2

HEAT STRESS MANAGEMENT PROGRAM AND PROCEDURES

INTRODUCTION

Panamerican employees engage in a variety of activities with potential exposure to excessive ambient temperatures and humidity, with the overall result being Aheat stress@. This procedure establishes the Panamerican Heat Stress Management Program. It establishes responsibilities and basic requirements for personnel who may be required to work in situations where the ambient temperature exceeds 21º C (70º F) while wearing protective equipment (e.g., hazardous waste site investigations) or when the ambient temperature exceeds 29º (85º F) while wearing normal clothing. Because heart stress is one of the most common and potentially serious illnesses at job sites and particularly hazardous waste sites, regular monitoring and other preventive measures are warranted.

There are no regulations addressing heat stress. However, it should be noted that OSHA does recognize heat stress as a potentially serious health hazard and can site employers under the Ageneral duty clause@ of the Occupational Safety Health Act if heat-related illness is occurring or likely to occur.

PROGRAM ADMINISTRATION AND RESPONSIBILITIES

The Heat Stress Management Program is administered by Panamerican Managers and Health and Safety personnel.

These Individuals:

- Oversee the implementation of the Heat Stress Management Program;
- Periodically audit and evaluate program implementation;
- Evaluate this procedure on an ongoing basis to see that it reflects current practice and regulations;
- Assist field crews in their implementation of this procedure.

Project Managers (PM) and Safety Personnel are responsible for:

- Implementing this Procedure in all field operations:
- Providing guidance to staff regarding heat stress management as described in the Procedure; and
- Providing feedback to management regarding program effectiveness.

Staff Members are responsible for:

- Complying with this Procedure as it applies to their activities; and
- Providing feed back to their supervisor regarding program effectiveness.

HEAT STRESS HAZARDS AND RISK FACTORS

Heat Stress is defined as the total net load on the body with contributions from both exposure to external sources, such as sunshine and hot surfaces, and from internal metabolic heat production. A person=s exposure to the increased ambient temperatures and humidity produces physiological responses referred to as heat stress which are characterized by an increase in the: a) Acore@ or Adeep body temperature@. b) heart rate, c) blood flow to the skin, and d) water and salt loss due to sweating. Conditions of excessive heat stress may occur either when the physical work is too heavy or the environment is too hot in relation to the work being performed. If work is performed under hot environmental conditions, the work load effort must be reviewed and the heat exposure limit maintained at or below the levels to protect the worker from the risk of acute heat illness.

In general, there are four types of physiological disorders associated with heat stress. They include:

- Heat Rash - a skin reaction occurring as a result of obstructed sweat glands, often associated with impermeable clothing.

- Heat Cramps - painful muscle spasms of extremities and abdomen, resulting from inadequate balance of electrolytes which are lost from sweating.

- Heat Exhaustion - a mild form of heat stroke due to depletion of body fluids and electrolytes. Blood vessels dilate despite decreased volume of blood. Symptoms include weakness, dizziness, nausea, rapid pulse, and a small increase in body temperature.

- Heatstroke - a potentially fatal disorder resulting from failure of the body=s thermoregulatory system. The classical description of heatstroke includes (1) a major disruption of central nervous function (unconsciousness of convulsions), (2) a lack of sweating (3) hot, dry, red or mottled skin, and (4) a core temperature in excess of 41° C (105.8° F). Heatstroke is a serious medical condition which calls for emergency medical action.

Seven factors play significant roles in the development of or predisposition to, heat stress disorders. These factors include:

- Acclimatization - Heat acclimatization leads to increased and quicker sweating, cooler skin due to an increase in evaporative cooling and a lower, more stable core body temperature. Maximal sweating rates in unacclimatized persons are lower, but salt concentrations in their perspiration are higher, requiring a higher rate of salt replacement.

- Age - Older individuals are generally more susceptible to heat stress than younger individuals. However, older healthy workers are able to perform well in hot jobs if permitted to proceed at a self-regulated pace.

- Gender - The average woman has a lower aerobic capacity than a similar-sized man. Nevertheless, when working at similar proportions of their maximum aerobic capacity, women perform similarly or only slightly less well than men.

- Body Fat - The lower level of physical fitness, decreased maximum work capacity and decreased cardiovascular capacity frequently associated with obesity predispose individuals to heat disorders.

- Water and Electrolyte Balance - Sustained, effective work performance in heat requires a replacement of body water and electrolytes lost through sweating. If this water is not replaced by drinking, continued sweating will draw on water reserves from both tissues and body cells leading to dehydration.

- Use of Alcohol and Medication - Not withstanding the potential hazards from impaired coordination and judgment, the ingestion of alcohol before or during work in the heat should not be permitted because it reduces heat tolerance and increases the risk of heat illness, Many drugs, including diuretics and antihypertensives, can interfere with the body=s thermoregulation.

- Physical Fitness - Physical conditioning enhances heat tolerance by increasing the functional capacity of the cardiovasculatory system, and reduces the time required to develop heat acclimatization by about 50% over those not physically fit.

The factors listed above are to be taken into account by all project personnel when planning or executing a project subject to heat stress conditions. The factors should be taken into consideration for:

- the development of the project schedule;
- the ordering of supplies/equipment;
- the support facilities to be made available at the site;
- the execution of work tasks; and
- the after work hours activities.

The following is a summary of signs and symptoms of heat stress:

Heat Rash may result from continuous exposure to heat or humid air .

Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

- Muscle Spasms
- Pain in the hands, feet and abdomen.

Heat Exhaustion occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool and moist skin
- Heavy sweating
- Dizziness, fainting and nausea

Heat stroke is the most serious form of heat stress. Temperature regulation fails, and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot and unusually dry skin
- Lack of or reduced perspiration
- Dizziness and confusion

- Strong, rapid pulse and coma.

HEAT AND STRESS PREVENTION

Preventive measures should be taken to prevent personnel from experiencing heat stress illness. Prevention of heat stress is also important because if an individual has experienced a heat illness incident, he has an increased likelihood of future occurrences. Preventive measures include: favorable work scheduling, acclimatization of workers to hot environments, drinking sufficient quantities of fluids, providing cool, sheltered work and rest areas, and utilizing cooling devices as appropriate of feasible. Heat stress monitoring/work rest regimens are discussed below.

Work Schedules and Activity

If possible, work should be scheduled during the coolest part of the day. Early morning and evening work can be considerably more effective than working midday when the additional time for breaks and heat stress monitoring are taken into account.

Employees should also be encourages to maintain a certain level of activity during the work shift. Prolonged standing in hot environments can lead to heat illness because the blood pools in the lower extremities. Workers should periodically walk about to encourage blood circulation from the feet and legs.

Acclimatization of Workers

A properly designed and applied heat acclimatization program will dramatically increase the ability of workers to work at a hot job and will decrease the risk of heat-related illnesses and unsafe acts. Heat acclimatization can usually be induced in 5 to 7 days of exposure to the hot job. For workers who have had previous experience with the job, the acclimatization regimen should be exposure for 50% on day 1, 60% on day 2, 80% on day 3 and 100% on day 4. For workers new to job the schedule should be 20% on day 1 with a 20% increase in each additional day.
Acclimatization can be induced by sustained elevations of the skin and core body temperatures above levels for the same work in cool environments for an hour or more per day. Acclimatization needs periodic reinforcement such as occurs daily during the work week. Persons may show some loss of acclimatization on the first day of the new shift after being idle for two days or over a weekend. After vacations of two weeks or longer he loss of acclimatization is substantial, several days at work will be needed before heat tolerance is fully restored.

Drinking Sufficient Quantities of Fluids

Under hot conditions where sweat production may reach 6 to 8 liters per day, voluntary replacement of the water lost is usually incomplete. The normal thirst mechanism is not sensitive enough to urge us to drink enough water to prevent dehydration. Individuals are seldom aware of the exact amount of seat they produce of how much water is needed to replace that lost in sweat; 1 liter/hour is not an uncommon rate of water loss. Every effort should be made to encourage individuals to drink water, low-sodium noncarbonated beverages or electrolyte replacement fluids (e.g., Gatorade). Lightly salted water (1 gram/liter of water (0.1%) or one level teaspoon per 15 quarts of water), should be provided to unacclimated workers. The salt should be dissolved completely and the water kept cool. Salt tablets as dietary supplements are not generally recommended.

Workers should drink at least 500 ml (one pint) of water before beginning work. The fluid should be maintained at temperatures of 10º to 15º (50 to 59º F). If possible, small quantities of fluids should be consumed at frequent intervals (e.g., 150 to 250 milliliters (ml), or at least a quarter pint, every 20 minutes) rather than the intake of 750 ml (3 cups) or more once per hour. Individuals vary, but water intake should total 4 to 8 liters (quarts) per day. When heat stress is considered a potential problem, a minimum of 1 liter/hour/person of water are to be maintained onsite. Individual paper or plastic cups will be provided in order to prevent the spread of communicable disease.

Alcohol and diuretics such as caffeine (contained in coffee, tea and soft drinks) can increase dehydration. Therefore employees with potential exposure to heat stress should be discouraged from the consumption of these types of fluids during and after working hours.

Cool, sheltered Work and Rest Areas

Exposure to direct sunlight significantly increases the overall thermal loading of the body, thereby increasing an individuals susceptibility to heat stress illnesses. Whenever possible work should be conducted under suspended tarps, in shady areas or in other sheltered areas in order to reduce thermal loading caused by the sun. Cool sheltered areas should be provided also for rest breaks. A rest area should be situated so that part of it is in the contamination reduction area so that workers can take breaks without being required to undertake a full decontamination procedure. Canopies or tarps and open air tents, are types of cool shelters which can provide shaded rest areas.

Cooling Devices

Auxiliary cooling devices can be successfully used to provide body cooling, especially to workers wearing protective garments at hazardous waste sites. Vortex coolers utilize high velocity air which is directed inside the protective clothing. Vortex coolers have been used successfully in some operations. Cooling vests utilizing Ablue ice@ type packs can provide some cooling to the torso, but add weight for the wearer and can inhibit body movements.

Newer, more sophisticated tube and refrigerant systems woven into undergarments are also available. However, some of these systems ,,may not be effective in situations where the work involves considerable motion, since bending and lifting can crimp the tubes, impending the flow of refrigerant.

Heat Stress Monitoring

Several heat stress monitoring systems have been devised to help manage heat stress in hot work environments. Panamerican performs heat stress monitoring when: 1) employees are wearing normal work clothing in ambient temperatures exceeding 29º C, (85º F) and 2) employees wearing chemical protective clothing (including paper coveralls) working in ambient temperatures exceeding 21º C (70º F). The temperature differential is related to the reduced ability of a person to maintain a core temperature of $\pm$ 37º C (98.6º F) when wearing chemical protective clothing.

It should be noted by personnel that there are no Afast and true@ methods of heat stress monitoring; likewise there are no regulations concerning heat stress monitoring. Individual susceptibility to heat stress is highly variable. Some individuals are highly susceptible to any increase in their internal body temperature while other individuals can work very well with internal body temperatures of 39ºC (102.2º F) or higher.

The heat stress monitoring systems should be used by Site Safety Officers as guidelines and not necessarily as hard, fast rules. Individuals working in elevated temperatures should be queried on a regular basis regarding their perceived state of heat stress. If the calculated heat stress index value indicates that work can continue but a person states that they believe they are experiencing heat stress, the work effect should be discontinued and a rest break taken.

Likewise, if the calculated heat stress index value indicates that a rest break should be taken but the workers believe they can work longer, they should be permitted to work longer providing that their heart rates do not exceed 110 beats per minute. If the individual's heart rate rates exceed 110 beats per minute a rest break will be taken. In all cases, individual workers should not be permitted or expected to perform excessive work which could result in heat stress. If a SSO has any concerns that an individual may be pushing himself/herself past the Abreaking point@ the calculated work/rest regimen will be followed.

For strenuous field activities that are part of ongoing site work activities in hot weather, the following procedures shall be used to monitor the body=s physiological response to heat, and to monitor the work cycle of each site worker. There are two phases to this monitoring: the initial work/rest cycle is used to estimate how long the first work shifts of the day should be. Heart rate monitoring of each worker will establish the length of the successive work periods. Both phases are to be used are to be used for heat stress monitoring. Failure to use either one could place workers at risk of heat-related disorders.

<u>Phase 1 - Determination of the Initial Work - Rest Regimen</u>

The determination of the initial work - rest regimen can be performed using either of two methods:

-The Modified Dry Bulb Index; or
-The Wet Bulb Globe Thermometer (WBGT) Index

After the initial work - rest regimen has been determined, environmental conditions must be monitored for changes which would require a modification to the work - rest regimen. This, coupled with the heart rate monitoring, determines the work cycles to be followed on a site.

The Modified Dry Bulb Index accounts for the effects caused by solar, load, air temperature, and chemical protective clothing, under a light work load (walking at approximately 3 mph). A mercury thermometer, shielded from direct sunlight, is used to measure ambient temperature. The percentages of (of time) of sunlight and cloud cover are then estimated to determine a sunshine quality factor (e.g., 100% sunshine - no cloud cover = 1.0; 50% sunshine - 50% cloud cover = 0.5; 0% sunshine - 100% cloud cover = 0.0). When these two sets of values have been obtained, they are inserted into the following equation to calculate the adjusted temperature:

$$T\,(^{o}C, \text{adjusted}) = T\,(^{o}C, \text{actual}) + (7.2 \text{ x sunshine quality factor})$$

-OR-

$$T\,(^{o}F, \text{adjusted}) = T\,(^{o}F, \text{actual}) + (13 \text{ x sunshine quality factor})$$

After the adjusted temperature has been calculated, the length of the first work shift can be determined using the following table:

Initial Break and Physiological Monitoring Cycles

ADJUSTED TEMPERATURE	NORMAL WORK CLOTHES	PROTECTIVE CLOTHING
90^0F (32.2^0 C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5^0-90^0 F (30.8^0-32.2^0 C)	After each 60 minutes of work	After each 30 minutes of work
82.5^0-87.5^0 F (28.1^0-30.8^0 C)	After each 90 minutes of work	After each 60 minutes of work
77.5^0-82.5^0 F (25.3^0-28.1^0 C)	After each 120 minutes of work	After each 90 minutes of work
72.5^0-77.5^0 F (22.5^0-25.3^0 C)	After each 150 minutes of work	After each 120 minutes of work

NOTE: The standard rest period is 15 minutes

WET BULB GLOBE THERMOMETER INDEX

The Wet Bulb Globe Thermometer (WBGT) Index was developed by the U.S. Army in the 1950s to prevent heat stress in army recruits. The WBGT Index accounts for the effects caused by humidity, air movement, evaporation, air temperature and work rate. It does not, however, account for the effects of chemical protective clothing, non-acclimatized workers, age, or other factors which may affect the likelihood of heat stress. Because of this, it is necessary to make adjustments to the index and conduct Heart Rate Monitoring.

WBGT measurements are usually obtained through the use of are-contained electronic devices. Such devices are easy to set up and can provide the user with the capabilities to store data and download to print out a hard copy.

Heat produced by the body and the environmental heat together determine the total heat load. Therefore, after the WBGT Index has been obtained, the anticipated work load category of each job shall be determined and the initial-rest regimen established using the table below.

The work load category may be determined by ranking each job into light, medium and heavy categories on the basis of type of operation. Examples of each category are:

Light work:	sitting or standing to control machines, performing light hand work
Moderate work:	walking about with moderate lifting and pushing; and
Heavy work:	pick and shovel work.

PERMISSIBLE HEAT EXPOSURE			
WORK-REST REGIMEN	WORK LOAD		
	LIGHT	MODERATE	HEAVY
	30.0^0 C/86^0 F	26.7^0 C/80.1^0 F	25^0C/77^0F
75% Work-25% Rest Each Hour	30.6^0 C/87.1^0 F	28^0 C/82.4^0 F	25.9^0 C/78.6^0 F
50% Work-50% Rest Each Hour	31.4^0 C/88.5^0 F	29.4^0 C/85.0^0 F	27.9^0 C/82.2^0 F
25%Work-75 % Rest Each Hour	32.2^0 C/90.0^0 F	31.1^0 C/88.0^0 F	30.0^0 C/86.0^0 F

The table reads as follows:

Light, continuous work is possible at any WBGT reading up to 30^0 C (86^0F) but above that limit work breaks are needed to recover from the heat; light work at temperatures of between 30.0 and 30.6^{0}C (86 to 87^{0}F) can be conducted, but 15 minute breaks must be taken every hour, etc. It is important to note that this table is applicable primarily to healthy, acclimatized personnel; wearing standard work clothing.

NOTE: An additional 6 to 11^{0}C (42.8 to 51.8^{0}F) must be added to the calculated WBGT temperature for personnel wearing chemical protective clothing prior to determining the initial work - rest regimen from this table. Because the WBGT Index does not take into account unacclimatized workers, or individual susceptibilities, the addition to the WBGT value does not eliminate the requirement for Heart Rate Monitoring after work has begun.

Phase 2 - Heart Rate Monitoring

An increase in the heart rate is a significant indication of stress, whether induced by exposure to heat or through physical labor. Although baseline heart rates can vary significantly between individuals and during the day for an individual, a heart rate of 110 beats per minute or greater is an indication of physiological stress. To prevent heat stress illnesses, the heart rate (HR) should be measured by radial (wrist) or carotid (neck) pulse for 30 seconds as early as possible in the rest period. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 33 percent while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work period should be further shortened by 33 percent while the length of the rest period stays the same.

ATTACHMENT 3

TRENCHING AND EXCAVATION HEALTH AND SAFETY REQUIREMENTS

REGULATORY AUTHORITY

Excavations will be performed in accordance with OSHA 29 CFR, subpart P, 1926:650-1926.652 and USACOE EM 385-1-1 section 25 requirements as they apply to project activities.

GENERAL

- **At all times the need for personnel to enter excavations will be minimized. Inspections or sample removal will be done from above the excavation, whenever possible.**
- **Personnel will only enter excavations after the requirements of this plan have been met.**
- **Personnel protective equipment including hard hat, safety glasses and steel-toe work boots may be required.**

SURFACE ENCUMBRANCES

Surface encumbrances such as structures, fencing, piping, stored material etc. which may interfere with safe excavations will be avoided, removed or adequately supported prior to the start of excavations. Support systems will be inspected daily.

UNDERGROUND UTILITIES

Underground utility locations will be checked and determined and permits as necessary will be in place prior to initiating excavations. Local utility companies will be contacted at least two days in advance, advised of proposed work, and requested to locate underground installations. When excavations approach the estimated location of utilities, the exact location will be determined by careful probing or hand digging and when it is uncovered, proper supports will be provided.

OVERHEAD OBSTACLES

A minimum safe distance of 20 feet will be maintained when working around overhead high-voltage lines or the line will be de-energized following appropriate lock-out and tag-out procedures by qualified utility personnel.

ENTRY/EXIT ROUTES

Excavations five feet or more deep will require an adequate means of exit, such as a ladder, ramp, or steps and located so as to require no more than 25 feet of lateral travel. Under no circumstances will

personnel be raised.

VEHICLE CONTROL/SAFETY

Personnel working around heavy equipment, or who may be exposed to public vehicular traffic will wear a traffic warning vest consisting of at least 400 square inches of red or orange material. At night, at least 400 square inches of florescent or other reflective material will be worn.

For excavation work on or adjacent to highways or streets, signs, signals, and barricades tat conform to the requirements of the current American National Standards Institute (ANSI) D6.1, Manual on Uniform Traffic Control Devices for Streets and Highways will be used to protect work areas. Signs, signals, and barricades will be adequately lighted at night. Flagmen will be provided when signs, signals and barricades do not provide adequate protection. Flagmen will use signals and procedures contained in the current issue of ANSI D6.1. At night, flagmen will be clearly illuminated so as to be easily seen by approaching traffic.

For mobile equipment operating next to or approaching the edge of an excavation, the operator will have a clear view of the edge of the excavation, or a warning system such as barricades, hand or mechanical signals, or stop logs will be used. If possible the surface grade will slope away from the excavation.

Personnel will be safely located in and around the trench and will not be permitted to work underneath loads handled by lifting or digging equipment. Personnel are required to stand away from vehicles being loaded and unloaded. Operators can remain in the cabs of vehicles being loaded or unloaded provided the vehicles are equipped to provide adequate protection to the operator.

HAZARDOUS ATMOSPHERES

Hazardous atmospheres, such as oxygen deficiency (atmospheres containing less than 19.5% oxygen), flammable gases or vapors (airborne concentrations greater than 20% of the lower explosive limit), and toxic gases or vapors (airborne concentrations above the OSHA Permissible Exposure Limit or other exposure limits) may occur in excavations, especially around landfills and hazardous waste sites.

In locations where oxygen deficiency or hazardous gaseous conditions are possible, the air in the excavation will be tested before personnel are permitted to enter an excavation deeper than 4 feet. When flammable gases are present, adequate ventilation will be provided and sources of ignition will be eliminated. Ventilation or respiratory protection will be provided to prevent personnel exposures to oxygen deficient or toxic atmospheres. Periodic retesting (at least each shift) of the excavation will be conducted to verify that the atmosphere is acceptable. A log or field book records will be maintained of all test results.

WATER ACCUMULATION HAZARDS

Personnel will not work in excavations that have accumulated water or where water is accumulating unless adequate precautions have been taken. These precautions can include special support or shield systems, water removal systems such as pumps, or safety harnesses and lifelines. Water removal systems will be operated and monitored by experienced personnel. Diversion ditches or dikes will be used to prevent surface water from entering the excavation and to provide adequate drainage of the area around the excavation. Adequate precautions, as described above, will be taken for excavating

subject to heavy rains.

STABILITY OF ADJACENT STRUCTURES

Support systems such as shoring, bracing, or underpinning will be provided to maintain the stability of adjoining buildings, walls, or other structures endangered by the excavation operations. Excavations below a foundation or retaining wall that could be reasonably expected to pose a hazard to personnel will not be permitted unless:

- **a support system is provided**
- **The excavation is in stable rock; or**
- **A Registered Professional Engineer has determined that the structure will not be effected by the excavation activity or that the excavation work will pose a hazard to employees. The Professional Engineer is required to demonstrate how the above determination was made on the basis of appropriate calculations.**

Sidewalks will not be undermined unless shored to protect from possible collapse.

PROTECTION FROM LOOSE ROCK, MATERIALS OR SPOILS

In excavations and trenches that personnel may be required to enter, loose rock, excavated or other material, and spoils will be effectively stored and retained at least two feet or more from the edge of the excavation.

As an alternative to the clearance prescribed above, barriers or other effective retaining devices may be used in order to prevent spoils or other materials from falling into the excavation.

Walkways, runways, and sidewalks will be kept clear of excavated material from other obstructions.

Scaling operations may be used to remove loose material and will be performed only by experienced crews under the direct supervision of a competent supervisor. The scalers will be provided with scaler=s lifelines, safety belts, boatswain chair, and other safety equipment necessary for their protection.

FALL PROTECTION

Walkways or bridges with standard guardrails that meet OSHA specifications will be provided where employees, the public, or equipment are required to cross over excavations.

Adequate barrier physical protection will be provided at all remotely located excavations. All excavations will be barricaded or covered.

EMERGENCY RESCUE

In the event of a cave-in, the Emergency Rescue Squad will be immediately notified. The caller should provide his name, location, nature of the accident (an excavation collapse), the dimensions of the excavation, and number of people trapped in the excavation. Personnel are not to enter a collapsed trench to attempt rescue. This may cause a further collapse of the trench. Under no circumstance is heavy equipment to be used to attempt rescue of personnel in a collapsed excavation; injury or decapitation could be the result. All heavy equipment and traffic in the area is to be shut down and

stopped to reduce vibration. Pumps should be started if water ensues.

INSPECTION PROGRAM

Safety personnel will conduct daily inspections of the excavation, the adjacent areas, and protective systems. Inspections will be conducted prior to the start of work and as needed throughout the work shift. Inspections will also be made after every rainstorm or other occurrence that increases the hazard of collapse (i.e., vibration from heavy equipment, freezing and thawing, etc.).

The excavation inspection will include a check for the following:

- **Evidence if situations that could result in possible cave-in (i.e. soil crumbling or sloughing, water saturated soils, freezing and thawing, unusual vibrations such as from heavy equipment, heavy rains, surface run off entering trench, etc.);**
- **Indications of failure of protective systems;**
- **Hazardous atmosphere (oxygen deficiency, flammable and toxic gases and vapors);**
- **Condition and support of exposed underground installations;**
- **Adequate means of egress;**
- **Signs, signals, and barricades for work area protection;**
- **Precautionary measures to control water accumulation;**
- **Stability and support of adjacent structures; and**
- **Adequate protection from loose rock and soil.**

PROTECTIVE SYSTEMS

Personnel working in excavations will be protected from cave-ins by sloping and/or benching of excavation walls, a shoring system or some other equivalent means except when:

- **The excavation is made entirely in stable rock; or**
- **Excavations are less than five feet deep and safety personnel have determined that there is no indication of potential cave-in. Depending on site and soil conditions protective measures may be taken for the excavations less than five feet in depth.**

The most important factor influencing the choice of protective systems is the soil type classification. Once the soil type has been classified, selection of the protective system, the determination of the angle of repose for sloping and benching, and the design of shoring systems will be made. Decisions will be based on careful evaluation of pertinent factors such as depth of cut; possible variation in water content of the material while the excavation is open; anticipated changes in materials from exposure to air, sun, water, or freezing; loading imposed structures equipment, overlying material, or stored material; and vibration from equipment, blasting traffic or other sources.

Soil Classification

Appendix A of the OSHA Excavation Standard describes a methjod to classify soils into four types:

1. Stable Rock - Solid mineral matter that can be excavated with vertical sides.

2. Type A - cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) or greater. Examples include: clay; silty clay; sandy clay; clayey loam; and cemented soils such as caliche and hardpan. No soil is considered to be Type A if it is fissured, subject to vibration, previously disturbed, or part of a sloped, layered system.

3. Type B - cohesive soils with an unconfined compressive strength of greater than 0.5 tsf but less than 1.5 tsf. Examples include: angular gravel similar to crushed rock; silt; silty loam; and sandy loam; Type B soils also include : previously disturbed soils that are not type C; Type A soils that are fissured or subject to vibration; and dry rock that is not stable.

4. Type C - cohesive soils with an unconfined compressive strength of 0.5 tsf or less. Examples include: gravel; sand; loamy sand; submerged soil or soil from which water is seeping; submerged rock that is not stable.

The engineer, geologist, or safety personnel will conduct at least one visual and at least one manual test as described in the OSHA excavation standard in order to classify soils. Visual tests include looking for : particle size and soil cohesiveness (clumping); cracking in the excavation sides which suggests fissured material; underground installations ans previously disturbed soils; layered soil systems that slope toward the excavation; evidence of surface water and water seeping from the sides of the excavation; and sources of vibration that may affect the excavation stability. Manual tests include: plascticity; dry strength; tumb penetration; drying test; and strength tests using a pocket penetrometer or hand-operated shearvane.

<u>Sloping and Benching</u>

One of the following options for sloping and benching systems described in section 1926.652(b) of the OSHA Excavation Standard will be used in excavations of .5 foot or deeper or at the discretion of the safety personnel:

- **The walls of excavation will be sloped at an angle not steeper than 0ne-and one-half horizontal to one vertical. Sloping configurations will follow the slopes shown for Type C soils in Appendix B of the OSHA Excavation Standard.**

- **Maximum allowable slopes and sloping and benching configurations will be determined according to soil type as described in Appendices A and B of the OSHA Excavation Standard.**

- **Use of other written tabulated data and designs, such as tables and charts, to design sloping and benching systems. A copy of the tabulated data must be approved by a registered Professional Engineer. A copy of the tabulated data must be kept at the job site.**

Personnel are not allowed to work on the faces of sloped or benched excavations above other workers unless the workers at the lower levels are protected from falling material or equipment. Similar protection will be provided for personnel working in excavations below other workers.

<u>Support Systems, Shield Systems, and Other Protective Devices</u>

One of the following options described in OSHA (1926.652 (c)) will be followed.

- **Timber shoring, designed according to the conditions and requirements of Appendix C of the OSHA Excavation Standard or aluminum hydraulic shoring designed according to manufacturers tabulated data or Appendix D of the OSHA Excavation Standard. In order to use the information in Appendices C or D, the soil type must first be determined using the classification system in Appendix A. For each soil type the size and spacing of the cross braces, uprights, and walls that comprise the shoring system are then selected based on the depth and width of the trench.**

- **Use of the manufacturer=s written tabulated to design support systems, shielded systems, and other protective devices. Any deviation from this tabulated data must be approved by the manufacturer. A copy of the tabulated data as well as any approvals to deviate from the tabulated data must be kept at the job site.**

- **Use of other written tabulated data to design support systems, shield systems, and other protective devices. The tabulated data must be approved by a Registered Professional Engineer. A copy of the tabulated data must be kept at the job site.**

- **Use of a written support system, shield system, and other protective device design that has been approved by a Registered Professional Engineer. A copy of the written design must be kept at the job site.**

<u>Installation and Removal of Support</u>

Cross braces or trench jacks, uprights, and walls will be secured together to prevent sliding, falling or kickouts.

Additional precautions by way of shoring and bracing will be taken to prevent slides or cave-ins when excavations or trenches are made in locations adjacent to backfilled excavations, or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or any other source.

If it is necessary to place or operate power shovels, derricks, trucks, materials, or other heavy objects on a level above or near any excavation, the side of the excavation will be sheetpiled, shored, and braced as necessary to resist the extra pressure due to such superimposed loads.

Backfilling and removal of trench supports will progress together from the bottom of the trench. Jacks or braces will be released slowly and , in unstable soil, ropes will be used to pull out the jacks or braces from above after employees have cleared the trench.

<u>Shield Systems</u>

Portable trench boxes or sliding trench shields may be used for protection of personnel in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they will be designed, constructed and maintained in a manner which will provide protection equal to or greater than the sheeting or shoring required for the trench. Shields will be installed so as to restrict lateral or other hazardous movement. Personnel are not allowed inside shields when shields are being moved.

EXCAVATION SAFETY LIST

To be completed prior to each work shift, or prior to personnel entering a new trench for the first time, by the Site Safety Officer/Competent Person:

Project______________________Location____________________________________

Job Number____

Competent Person(CP)*__________________________Date__________________

		Yes	No	N/A
1.	Has the site been cleared for utilities and other underground obstructions?	____	____	____
2.	If on public property, has the regional utility locating service been notified?	____	____	____
3.	Has the excavation equipment been safety checked by the operator?	____	____	____
4.	Are copies of relevant OSHA excavation regulations available on site?	____	____	____
5.	Will the excavation be 5 feet or more in depth?	____	____	____
6.	If 4 is yes, will personnel enter the excavation at any time?	____	____	____
7.	If 4a is yes, have provisions been made for shoring, sloping, or benching the excavation? Describe: ____________________________________ ____________________________________ ____________________________________	____	____	____
8.	Has an inspection of the site and excavation been conducted by the SSO?	____	____	____
9.	Has the Competent Person conducted visual and manual tests to classify the soil?	____	____	____

*** According to Federal OSHA, A Competent Person is a person who is capable of identifying existing and predictable hazards in the surroundings; or working conditions which are unsanitary, hazardous, or dangerous to employees; and who has the authority to take prompt corrective measures to eliminate them.**

10. G Visual Test ______________________________(type)
G Manual Test______________________________(type)
G Soil Classification_________________________(type)

11. Are there any conditions that might expose employees to injury from possible moving ground? ____ _____ ____

12. Is excavated material being placed at least 2 feet from the edge of the excavation? ____ ____ ____

13. Is work in the excavation at all times under the immediate supervision of the SSO or other competent person? ____ ____ ____

14. Is there a stairway, ladder, or ramp securely fastened in place to provide ingress and egress from the excavation? ____ ____ ____

15. If the excavation is 4 feet or more in depth, are safe means of access (see 8) provided so as to require no more than 25 feet of lateral travel to reach them? ____ ____ ____

16. If structural ramps are installed that are used for access/egress: were they designed by a qualified engineer? ____ ____ ____

17. Do the structural ramps have appropriate means to prevent slipping and are the ramps uniform in thickness? ____ ____ ____

18. Are walkways or bridges provided across the excavation to safe crossing? ____ ____ ____

19. If excavations are 71/2 or more feet in depth, do the walkways have guardrails and toeboards? ____ ____ ____

20. Are undermined structures adequately supported to safely carry all anticipated loads and protect workers? ____ ____ ____

21. Are there adequate means provided to prevent mobile equipment from inadvertently entering the excavation? ____ ____ ____

22. Is the excavation well marked and barricaded to prevent personnel from falling IN? ____ ____ ____

23. Are means available to prevent surface water from entering the excavation and to provide ____ ____ ____

adequate drainage of the area adjacent to the trench?

24.	**Where it is reasonable to expect hazardous atmospheres, including oxygen deficiency, to exist in the excavation, is appropriate atmosphere testing equipment available.**	____	____	____
25.	**Has the testing equipment been calibrated, and the calibrations recorded, today?**	____	____	____
26.	**Are employees trained in proper use of this equipment?**	____	____	____
27.	**Has a harness and lifeline been provided whenever an employee is required to enter a confined footing excavation?**	____	____	____
28.	**Is appropriate personal protective equipment (hardhat, safety boots, eye protection, etc.) available and in use?**	____	____	____

Notes:____
____
____
____

______________________________ ______________________________________

CPs Name (Print) **Signature**

ATTACHMENT 4

MAP TO HOSPITAL

Map adapted from Google Earth Pro®

BE3CORP	Attachment 4 – Map to Hospital Harrison Place Lockport, New York 14094	Revisions 1
12-21-2020	SCALE: N/A	SHEET 1 of 1

ATTACHMENT 5

NYSDOH GENERIC CAMP AND
FUGITIVE DUST AND PARTICULATE MONITORING

BE3CORP
BRYDGES ENGINEERING IN ENVIRONMENT & ENERGY

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.

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Appendix 1B
Fugitive Dust and Particulate Monitoring

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

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

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

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

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50° C (14 to 122° F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

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

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

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

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

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

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

APPENDIX B

QUALITY ASSURANCE AND QUALITY CONTROL PLAN

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QUALITY ASSURANCE/QUALITY CONTROL PLAN

Harrison Place
Northwest Corner - Intersection of South & Washburn Street
Lockport, New York
Tax Map ID No.: P/O 109.14-4-20.1
Property County: Niagara
Site No.: C932177

Prepared for:

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December 2020

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1.0 INTRODUCTION

This Quality Assurance/Quality Control (QA/QC) Plan provides an overview of QA/QC procedures required for the project. It also provides methods for laboratory testing of environmental samples obtained from the Site, which helps to ensure the quality of the data produced. The organizational structure for this project is presented in the Work Plan, which identifies the names of key project personnel. The project manager is responsible for verifying that QA procedures are followed in the field so that quality, representative samples are collected. The Project Manager is in contact with the analytical laboratory to monitor laboratory activities so that holding times and other QA/QC requirements are met. The anticipated quantity of field samples collected, and corresponding analytical parameters/methods are provided below.

ANALYTICAL SUMMARY TABLE

PARAMETER	EPA METHOD	QUANTITY(GW)[A]	Water	Soil	Air
Part 375 VOCs + TICs	8260	9	1	15	15
Part 375 SVOCs + TICs	8270	9	1	15	15
Part 375 Metals	6010/7470/7471	9	1	15	15
Part 375 PCBs	8082	9	1	15	15
Part 375 Pesticides	8081	9	1	15	15
PFAS Contaminants	537.1	9	1	15	15
1,4 Dioxane	8270SIM	9	1	15	15

Note, totals include 1 sample for a duplicate pre matrix. Holding Times: 8260-14 days and 8270, 8081, and 8082-7 days
A = 1 MS, 1MSD and 1 duplicate

All samples analyzed for VOCs and/or SVOCs will report TICs as specified in DER-10 Section 2.1(a)1.i. Sampling for emerging contaminants should be conducted in accordance with the NYSDEC Guidance for Sampling and Analysis of PFAS (January 2021). As detailed in the guidance document, PFAS compounds should be analyzed under EPA Method 537.1. The analytical laboratory proposed for use for the analysis of samples will be a certified NYSDOH ELAP laboratory. The QA Manager of the laboratory will be responsible for performing project-specific audits and for overseeing the quality control data generated. The field geologist/technician coordinates all personnel involved with field sampling, verifies that all sampling is conducted per the FSP, and communicates regularly with the Project Manager. The ultimate responsibility for maintaining quality throughout the project rests with the Project Manager, including field and laboratory QA/QC.

2.0 DATA QUALITY OBJECTIVES

2.1 BACKGROUND

Data quality objectives (DQOs) are qualitative and quantitative statements, which specify the quality of data required supporting the investigation for the site. DQOs focus on the identification of the end use of the data to be collected. The project DQOs are achieved utilizing the definitive data category as outlined in *Guidance for the Data Quality Objectives Process,* EPA QA/G-4

(September 1994). All sample analyses will provide definitive data, which are generated using rigorous analytical methods such as reference methods approved by the United States Environmental Protection Agency (USEPA). The purpose of this investigation is to determine the nature and extent of contamination at the site.

Within the context of the purpose stated above, the project DQOs for data collected during this investigation are:

- To assess the nature and extent of contamination in soil, groundwater, and soil vapor
- To maintain the highest possible scientific/professional standards for each procedure
- To develop sufficient data to assess whether the levels of contaminates identified in the media sampled exceed regulatory guidelines

2.2 QA Objectives for Chemical Data Measurement

Sample analytical methodology for the media sampled and data deliverables are required to adhere to the requirements in NYSDEC Analytical Services Protocol. Laboratories are instructed to complete Sample Preparation and Analysis Summary forms and submit with the data packages. The laboratory is instructed that matrix interferences must be fixed to the extent practicable. To achieve the definitive data category described above, the data quality indicators of precision, accuracy, representativeness, comparability, and completeness are measured during analysis.

2.2.1 Precision

Precision examines the distribution of the reported values about their mean. The distribution of reported values refers to how different the individual reported values are from the average reported value. Precision may be affected by the natural variation of the matrix or contamination within that matrix and by errors made in field or laboratory handling procedures. Precision is evaluated using analyses of a laboratory matrix spike/matrix spike duplicate (for organics) and matrix duplicates (for inorganics), which indicate analytical precision through the reproducibility of the analytical results. Relative Percent Difference (RPD) is used to evaluate precision and it must meet the method requirements.

2.2.2 Accuracy

Accuracy measures the analytical bias in a measurement system. Sources of error are the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques. These data help to assess the potential concentration contribution from various outside sources. The laboratory objective for accuracy is to equal or exceed the accuracy demonstrated for the applied analytical methods on samples of the same matrix. The percent recovery criterion is used to estimate accuracy based on recovery in the matrix spike/matrix spike duplicate and matrix spike blank samples. The spike and spike duplicate, which will give an indication of matrix effects that may be affecting target compounds is also a good gauge of method efficiency.

2.2.3 Representativeness

Representativeness expresses the degree to which the sample data accurately and precisely represent the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program or sub-sampling of a given sample. Objectives for representativeness are defined for sampling and analysis tasks and are a function of the investigative objectives. The sampling procedures described in the Field Sampling Plan have been selected with the goal of obtaining representative samples for the media of concern.

2.2.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. A DQO for this program is to produce data with the greatest possible degree of comparability. This goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. Complete field documentation will support the assessment of comparability. Comparability is limited by the other parameters (e.g., precision, accuracy, representativeness, completeness, comparability), because only when precision and accuracy are known can data sets be compared with confidence. For data sets to be comparable, it is imperative that contract-required methods and procedures be explicitly followed.

2.2.5 Completeness

Completeness is defined as a measure of the amount of valid data obtainable from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is important that appropriate QA procedures be maintained to verify that valid data are obtained to meet project needs. For the data generated, a goal of 90% is required for completeness (or usability) of the analytical data. If this goal is not met, then project personnel will determine whether the deviations might cause the data to be rejected.

3.0 SAMPLING LOCATIONS, CUSTODY, AND HOLDING TIMES

Sampling locations are discussed in Work Plan. Procedures addressing field and laboratory sample chain-of-custody and holding times details are presented in the Field Sampling Plan. The laboratory must meet the method required detection limits which are referenced within the methods.

4.0 CALIBRATION PROCEDURES AND FREQUENCY

To obtain a high level of precision and accuracy during sample processing procedures, laboratory instruments must be calibrated properly. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following sections describe the analytical support areas and laboratory instrument calibration procedures.

4.1 ANALYTICAL SUPPORT AREAS

Prior to generating quality data, several analytical support areas must be considered; these are detailed in the following paragraphs.

Standard/Reagent Preparation – Primary reference standards and secondary standard solutions shall be obtained from National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished according to the methods referenced. All standards and standard solutions are to be formally documented (i.e., in a logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparers name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

Balances – The analytical balances shall be calibrated and maintained in accordance with manufacturer specifications. Calibration is conducted with two Class AS" weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and they must be properly documented in permanently bound logbooks.

Refrigerators/Freezers – The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised, and the integrity of the analytical samples is upheld. Appropriate acceptance ranges (2 to 6°C for refrigerators) shall be clearly posted on each unit in service.

Water Supply System – The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) to eliminate false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses and ion-exchange treatment is recommended for inorganic tests. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

4.2 LABORATORY INSTRUMENTS

Calibration of instruments is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet established quantitation limits. Each instrument for organic and inorganic analyses shall be calibrated with standards appropriate to the type of instrument and linear range established within the analytical method(s). Calibration of laboratory instruments will be performed according to specified methods.

In addition to the requirements stated within the analytical methods, the contract laboratory will be required to analyze an additional low-level standard at or near the detection limits. In general, standards will be used that bracket the expected concentration of the samples. This will require the use of different concentration levels, which are used to demonstrate the instrument's linear range of calibration.

Calibration of an instrument must be performed prior to the analysis of any samples and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still calibrated. If the contract laboratory cannot meet the method required calibration requirements, corrective action shall be taken. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

5.0 INTERNAL QUALITY CONTROL CHECKS

Internal QC checks are used to determine if analytical operations at the laboratory are in control, as well as determining the effect sample matrix may have on data being generated. Two types of internal checks are performed and are described as batch QC and matrix-specific QC procedures. The type and frequency of specific QC samples performed by the contract laboratory will be according to the specified analytical method and project specific requirements. Acceptable criteria and target ranges for these QC samples are presented within the referenced analytical methods.

QC results which vary from acceptable ranges shall result in the implementation of appropriate corrective measures, potential application of qualifiers, and/or an assessment of the impact these corrective measures have on the established data quality objectives. Quality control samples including any project-specific QC will be analyzed are discussed below.

5.1 BATCH QC

Method Blanks – A method blank is defined as laboratory-distilled or deionized water that is carried through the entire analytical procedure. The method blank is used to determine the level of laboratory background contamination. Method blanks are analyzed at a frequency of one per analytical batch.

Matrix Spike Blank Samples – A matrix spike blank (MSB) sample is an aliquot of water spiked (fortified) with all the elements being analyzed for calculation of precision and accuracy to verify that the analysis that is being performed is in control. An MSB will be performed for each matrix and organic parameter only.

5.2 MATRIX-SPECIFIC QC

Matrix Spike Samples – An aliquot of a matrix is spiked with known concentrations of specific compounds as stipulated by the methodology. The matrix spike (MS) and matrix spike duplicate (MSD) are subjected to the entire analytical procedure to assess both accuracy and precision of the method for the matrix by measuring the percent recovery and relative percent difference of the two spiked samples. The samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. MS/MSDs are analyzed at a frequency of one each per 20 samples per matrix.

Matrix Duplicates – The matrix duplicate (MD) is two representative aliquots of the same sample which are prepared and analyzed identically. Collection of duplicate samples provides for the evaluation of precision both in the field and at the laboratory by comparing the analytical results of two samples taken from the same location. Obtaining duplicate samples from a soil matrix requires homogenization (except for volatile organic compounds) of the sample aliquot prior to filling sample containers, to best achieve representative samples. Every effort will be made to obtain replicate samples; however, due to interferences, lack of homogeneity, and the nature of the soil samples, the analytical results are not always reproducible.

Rinsate (Equipment) Blanks – A rinsate blank is a sample of laboratory demonstrated analyte-free water passed through and over the cleaned sampling equipment. A rinsate blank is used to indicate potential contamination from ambient air and from sample instruments used to collect and transfer samples. This water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. The rinsate blank should be collected, transported, and analyzed in the same manner as the samples acquired that day. Rinsate blanks for nonaqueous matrices should be performed at a rate of 10 percent of the total number of samples collected throughout the sampling event. Rinse blanks will not be performed on samples (i.e., groundwater) where dedicated disposable equipment is used.

Trip Blanks – Trip blanks are not required for nonaqueous matrices. Trip blanks are required for aqueous sampling events. They consist of a set of sample bottles filled at the laboratory with laboratory demonstrated analyte free water. These samples then accompany the bottles that are prepared at the lab into the field and back to the laboratory, along with the collected samples for analysis. These bottles are never opened in the field. Trip blanks must return to the lab with the same set of bottles they accompanied to the field. Trip blanks will be analyzed for volatile organic parameters. Trip blanks must be included at a rate of one per volatile sample shipment.

6.0 CALCULATION OF DATA QUALITY INDICATORS

6.1 PRECISION

Precision is evaluated using analyses of a field duplicate or a laboratory MS/MSD that indicate analytical precision through the reproducibility of the analytical results. RPD is used to evaluate precision by the following formula:

$$RPD = \frac{(X_1 - X_2)}{[(X_1 + X_2)/2]} \times 100\%$$

where:

X_1 = Measured value of sample or matrix spike

X_2 = Measured value of duplicate or matrix spike duplicate

Precision will be determined using MS/MSD (for organics) and matrix duplicates (for inorganics) analyses.

6.2 ACCURACY

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. The closer the numerical value of the measurement comes to the true value or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at known concentrations before analysis. Analytical accuracy may be assessed using known and unknown QC samples and spiked samples. It is presented as percent recovery. Accuracy will be determined from matrix spike, matrix spike duplicate, and matrix spike blank samples, as well as from surrogate compounds added to organic fractions (i.e., volatiles, semivolatiles, PCB), and is calculated as follows:

$$\text{Accuracy } (\%R) = \frac{(X_s - X_u)}{K} \times 100\%$$

where:

X_s - Measured value of the spike sample

X_u - Measured value of the unspiked sample

K - Known amount of spike in the sample

6.3 COMPLETENESS

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$Completeness\ (\%C) = \frac{(X_v - X_n)}{N} \times 100\%$$

where:

X_v - Number of valid measurements

X_n - Number of invalid measurements

N - Number of valid measurements expected to be obtained

7.0 CORRECTIVE ACTIONS

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

7.1 INCOMING SAMPLES

Problems noted during sample receipt shall be documented by the laboratory. The Project Manager shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.2 SAMPLE HOLDING TIMES

If any sample extraction or analyses exceed method holding time requirements, the Project Manager shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.3 INSTRUMENT CALIBRATION

Sample analysis shall not be allowed until all initial calibrations meet the appropriate requirements. All laboratory instrumentation must be calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed and, if necessary, reanalysis of all samples affected back to the previous acceptable calibration check.

7.4 REPORTING LIMITS

The laboratory must meet the method required detection limits listed in NYSDEC ASP, 10/95 criteria. If difficulties arise in achieving these limits due to a sample matrix, the laboratory must notify PEI project personnel for problem resolution. To achieve those detection limits, the laboratory must utilize all appropriate cleanup procedures to retain the project required detection limits. When any sample requires a secondary dilution due to high levels of target analytes, the laboratory must document all initial analyses and secondary dilution results. Secondary dilution will be permitted only to bring target analytes within the linear range of calibration. If samples are analyzed at a secondary dilution with no target analytes detected, the Project Manager will be immediately notified so that appropriate corrective actions can be initiated.

7.5 Method QC

All QC method-specified QC samples shall meet the method requirements referenced in the analytical methods. Failure of method-required QC will result in the review and possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed or re-extracted/redigested, then reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed or re-extracted/redigested, then reanalyzed at no cost. Project Manager shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

7.6 Calculation Errors

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review calculation or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.

8.0 DATA REDUCTION, VALIDATION, AND USABILITY

8.1 Data Reduction

Laboratory analytical data are first generated in raw form at the instrument. These data may be either in a graphic or printed tabular format. Specific data generation procedures and calculations are found in each of the referenced methods. Analytical results must be reported consistently. Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or USEPA sources. Individuals experienced with an analysis and knowledgeable of requirements will perform data reduction.

8.2 Data Validation

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use. All analytical results from soil and groundwater samples will have ASP Category B deliverables and DUSRs. The data validation will be in accordance with DER-10 Section 2.2 with ASP - Category B data deliverables provided by the laboratory and a DUSR provided for validation. Where possible, discrepancies will be resolved by the project manager.

- Technical holding times will be in accordance with NYSDEC ASP, 7/2005 edition.
- Organic calibration and QC criteria will be in accordance with NYSDEC ASP, 7/2005 edition. Data will be qualified if it does not meet NYSDEC ASP, 7/2005 criteria.

9.0 REFERENCES

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Quality Assurance Manual, Final Copy, Revision I, October 1989.

National Enforcement Investigations Center of USEPA Office of Enforcement. *NEIC Policies and Procedures.* Washington: USEPA.

New York State Department of Environmental Conservation (NYSDEC) 2005. *Analytical Services Protocol*, (ASP) 7/2005 Edition. Albany: NYSDEC.

NYSDEC "DER-10 Technical Guidance for Site Investigation and Remediation (DER-10)," dated May 3, 2010, Appendix 2B

APPENDIX C

FIELD SAMPLING PLAN

BRYDGES ENGINEERING IN ENVIRONMENT & ENERGY

FIELD SAMPLING PLAN

Harrison Place
Northwest Corner – Intersection of South & Washburn Street
Lockport, New York
Tax Map ID No.: P/O 109.14-4-20.1
Property County: Niagara
Site No.: C932177

Prepared for:

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December 2020

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1.0 INTRODUCTION

This Field Sampling Plan (FSP) provides procedures for the field activities designed in the Work Plan where soil, groundwater, and vapor sampling are required at the Site. The field procedures presented in this manual should be followed by all field personnel, as adherence can help to ensure the quality and usability of the data collected. The FSP should be used collectively with and comply with the following documents:

- The Health and Safety Plan (HASP).
- The Quality Assurance/Quality Control (QA/QC) Plan.
- The Release Investigation Work Plan (RIWP).

2.0 SOIL SAMPLING

Soil samples are obtained as outlined in the Work Plan, considering the following general protocol:

1. Inspect newly created boring core stratigraphy once obtained in/from the subsurface.
2. Sample soil, and record depth and any physical characteristics (e.g., contamination, odor, discoloration, debris, etc.) in the logbook.
3. Quickly place the calibrated photoionization detector (PID) into the exposed soil and record the instrument readings in the logbook.
4. Samples should be collected at locations and frequency per the Work Plan and QA/QC Plan.
5. Decontaminate sampling implements after use and between sample locations. When using dedicated sampling equipment, decontamination can be minimized.
6. Label each sample container with the appropriate sample identification and place sample in a cooler (cooled to 4 degrees Celsius) for shipment to the laboratory.
7. Initiate chain-of-custody procedures.

2.1 TEST PIT PROCEDURES

Test Pits are not planned for the RI. If something changes and they become necessary, the following procedures will apply:

Test pit sampling is a standard method of soil sampling to obtain representative samples for identification as well as to serve as a means of obtaining a significant information about the subsurface. The following steps describe the procedures for test pit operations.

2.1.1 Field Preparation

1. Verify underground utilities have been found.
2. Review scope of work, safety procedures and communication signals with site personnel.
3. Pre-clean the sampling equipment prior to use, as necessary.
4. Mark and review trench locations. Specific locations are determined in the field and are selected based on areas of visible or potential surface contamination or debris, pre-determined locations representing specific Site areas, and field obstructions.

2.1.2 Excavation and Sample Collection

1. Position backhoe/equipment into appropriate area considering direction of excavation, obstructions, safety concerns, etc.
2. Commence excavation with the backhoe upwind of the excavation, as possible.
3. Ensure continuous air monitoring has been activated.
4. Screen soil regularly for VOCs as excavation progresses and soil is stockpiled.
5. As directed by field technician for each test trench, topsoil, or cover soil (if any) is excavated and placed on poly/plastic sheeting.
6. Soil/material below the topsoil is excavated to the depth as directed by field technician and placed on poly/plastic sheeting separate from the topsoil/cover soil.
7. Segregate ‘clean’ material from impacted material, as possible, using visual observations and PID screening.
8. Record geologic log as trenches are excavated visually inspecting subsurface material for discoloration or staining and documenting pit/trench with photos. The following information will be recorded for each test pit log:

   - Depth, length, and width of the excavation.
   - Description of each lithological unit including depth and thickness of distinct soil, fill, or rock layers.
   - Description of any man-made impacts or apparent contamination.
   - Depth to groundwater and bedrock, if encountered.

9. Collect soil samples using dedicated stainless-steel spoons directly from the bucket of the backhoe at ground surface. No personnel shall enter the excavation to collect samples unless provisions in the HASP have been addressed for entering an excavation.
10. Place each soil sample directly into appropriate sample bottles/jars.
11. Clearly label the sample bottles and jars.
12. Place each jar in an ice-filled cooler.
13. Ship samples to laboratory as soon as possible, but no later than 24 hours after collection.
14. Document the types and numbers of samples collected on Chain-of-Custody.
15. Record time and date of sample collection and a description of the sample and any associated air monitoring measurements in the field logbook.
16. After sampling, backfill and compact (e.g., bucket and equipment tracks/wheels) the excavated material from each trench or pit prior to moving to next location.
17. Backfill with indigenous soil in the order in which the material was removed with the topsoil/cover soil placed last to cover the trench, placing impacted material at bottom of pit/trench and covering with ‘clean’ material.
18. Decontaminate sampling and excavation equipment between sampling locations (i.e., if not dedicated) and at completion over top of excavation area using dry methods initially and steam cleaning, as needed.

2.2 GEOPROBE PROCEDURES

Geoprobe direct push sampling is a standard method of soil sampling to obtain representative samples from the subsurface. Field preparation, sample collection, and data logging activities for Geoprobe sampling are identical to that of test pitting/trenching listed above. The following procedures detail activities, as directed by the field technician, for the execution of Macro Core drilling operations after rig is in a downwind position and continuous air monitoring and VOC screening activities have commenced:

1. Startup drill rig and raise mast.
2. Use star bit with rig in rotary setting to penetrate pavement (if applicable).
3. Excavate a hole large enough to set a road box before you advance the borehole (if applicable).
4. Unthread the shoe from the bottom of the sample tube and inset a sample liner and rethread the shoe on the bottom of the sample tube.
5. Thread the drive cap on the top of the sample tube.
6. Align the sample tube so it is plumb in both directions to ensure a straight borehole is drilled.
7. Drive the top of the sample tube into ground surface.
8. Unthread the drive cap from the top of the sample tube and thread the pull cap in its place.
9. Pull the sample tube from the ground using caution to not pinch your hand between the drill rods, pull cap, or rig.
10. Unthread the cutting shoe and pull the sample liner from the bottom of the sample tube. Use pliers to reach in the sample tube and grab the liner, if needed.
11. Cut the sample liner lengthwise in two places and present the sample on a table or plastic sheeting (or similar) to ensure all sample material is contained.
12. Insert a new liner and thread on the cutting shoe and repeat steps from #4 to #11 with the addition of a 4-foot long drill rod onto the top of the sample tube to advance a second 4-foot interval.
13. Proceed with this procedure until the desired depth or refusal is reached.
14. Upon completion of probing, decontaminate all equipment in contact with the soil/fill in a decontamination area using Alconox and water.
15. Backfill borings with indigenous soil in the order in which the material was removed with the topsoil/sand/cover soil placed last to cover the hole.

Reference: American Society for Testing Material (ASTM), 1992, ASTM D1586-84, Standard Method for Penetration Test and Split Barrel Sampling of Soils.

3.0 GROUNDWATER SAMPLING

3.1 WELL INSTALLATION PROCEDURES

Overburden Wells

The following procedure outlines a New York State Department of Environmental Conservation (NYSDEC)-approved method of constructing groundwater wells within unconsolidated material to monitor groundwater elevation and acquiring groundwater samples for laboratory testing. The following is a step-by-step method for the open-hole method of installing a groundwater well once a boring or augured hole has been drilled to a desired depth within the subsurface:

1. Thread a cap on the bottom section of well screen. If more than one section of well screen is required, thread the last section.
2. Lower the screen into the borehole with the riser section ready.
3. Add the riser sections to the screen. Do not drop the screen in the borehole.

4. Add riser sections as required until the bottom screen section touches the bottom of the borehole.
5. If completing the well with a road box, mark the riser two inches below the lid of the road box and then cut the riser.
6. Place a slip cap over the top of the rise section.
7. Place sand in the space between the borehole and the PVC screen and riser to the required depth. Place the sand in very slowly so it does not bridge in the well bore.
8. Place bentonite and cement above the sand-pack.
9. Grout in the road box with concrete mix.

Bedrock Wells

If the overburden soils are predominantly clay and silt, with very low permeability, then wells installed at the site will include shallow bedrock wells because overburden soils will not yield sufficient groundwater for sampling. Shallow bedrock groundwater monitoring wells will then be chosen as the most appropriate means for determining whether there had been historic impacts to the site groundwater from the site. The bedrock groundwater monitoring wells will be completed using a conventional truck mounted drill rig with hollow stem auger drilling techniques and standard rock coring equipment. It is anticipated that RI soil boring will have been completed across the project site and will provide a description of overburden soils. As such, overburden soils will be logged at the first well location using a standard 2-inch spilt spoon sampler. The remaining wells will only require random split spoon samples to confirm the information from the RI borings and first well completion.

Hollow stem augers will be advanced to the top of bedrock, and once auger refusal is encountered, a roller bit will then be used to create a “socket” in the top of bedrock. A 4-inch diameter PVC casing will be installed and cemented into the bedrock “socket”. The cement will be allowed to set for a minimum of one day. After the cement has set the bedrock will be cored to the appropriate depth based on examination of bedrock cores using standard rock coring equipment. Typically, the bedrock will be cored with an HQ (3-inch diameter) or appropriate rock core barrel. The bedrock cores will be examined and logged by a geologist, and the final well depth at each location will be determined through an examination of the bedrock fractures. The bedrock wells will be finished as “open-hole” bedrock wells, and the surfaces finished with flush mounted, sealed, “road box” covers. Well construction diagrams will be developed describing the well completion data and materials/methods used.

Prior to sampling, the monitoring wells will be developed by removing an amount of water from each well that is approximately equal to 5-10 well volumes or the amount appropriate for the well completion data and aquifer characteristics as described in Section 3.2. This will account for the estimated volume of any drilling water lost during bedrock coring. All development water will be placed in 55-gallon steel drums (unless otherwise determined with the NYSDEC) for subsequent disposal. Well development logs will be maintained. Once developed, the wells will be allowed to sit for an appropriate time before sampling. Prior to sampling, at least three well volumes of water will be purged from each well prior to sampling. Each well will be sampled using a disposable plastic bailer or low-flow pump depending on depth of water and usefulness of the pump.

3.2 WELL DEVELOPMENT PROCEDURES

At least 24 hours after completion of drilling and installation, well development is completed through pumping or bailing until the discharged water is relatively sediment free and the indicator parameters (e.g., pH, temperature, specific conductivity, etc.) have reached steady state. Development removes sediment and can improve the hydraulic properties of the sand pack. The effectiveness of this process is monitored to minimize the volume of discharged waters to obtain sediment-free samples. As approved by the regulatory agency, well development water can be discharged onto the ground surface downgradient of the well. Otherwise, this water must be containerized and sampled prior to discharge or disposal.

1. Select an appropriate well development method based upon water depth, well productivity, and sediment content of the water. Well development options include: (a) bailing; (b) manual pumping; and (c) submersible pumps. These options utilized with surging of the well screen using an appropriately sized surge block.
2. Decontaminate, as needed, and assemble equipment in the monitoring well based upon the method selected. Care should be taken not to introduce contaminants into the equipment or well during installation.
3. Proceed with development by repeated removal of water from the well until the discharged water is relatively sediment-free (i.e., < 50 NTUs). Volume of water removed pH and conductivity measurements are recorded on the Well Development/Purging Logs.

3.3 WELL PURGING PROCEDURES

To collect representative samples, groundwater wells must be adequately purged prior to sampling. Purging will require removing three to five volumes of standing water in rapidly recharging wells and at least one volume from wells with slow recharge rates. Sampling should commence as soon as adequate recharge has occurred. Although not required, it is recommended that purging and sampling occur at least 24 hours after development.

1. Remove well cover ensuring no foreign material enters the well.
2. Monitor the interior of the riser pipe for organic vapors using a PID. If reading of greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm before pumping is started.
3. Measure the water level below top of casing using an electronic water level indicator.
4. Determine the volume of water within the well by knowing the total depth of the well.
5. Wash the end of the probe with soap and rinse with deionized water between wells.
6. Utilize dedicated, new polyethylene discharge and intake tubing (preferably ½ inch diameter high density polyethylene [HDPE] and cannot use low density polyethylene [LDPE] for emerging contaminants) for each well.
7. Purge using bailers until the required volume is removed. If the well purges to dryness and recharges within 15 minutes, water can be removed as it recharges. If the well purges to dryness and is greater than 15 minutes, purging is terminated.
8. Purge until at least 1 volume of water is removed, but 3 to 5 volumes of water is preferred if recharge is sufficiently fast.
9. Calculate well volumes and record measurements for pH, temperature, turbidity, and conductivity during the purging along with physical observations.

3.4 WELL SAMPLING PROCEDURES

1. Perform well sampling within 24 hours of purging if well has recovered sufficiently to sample. If sufficient volume for analytical testing cannot be obtained from a well or if recharge exceeds 24 hours, then NYSDEC should be consulted on analytical priorities and validity of the sample.

2. Collect sample using bailers into appropriate containers.
3. Label sample bottles using a waterproof permanent marker per procedures outlined below.
4. Use verifiably clean sample bottles (containing required preservatives) and place samples on ice in coolers for transport to the analytical laboratory, who will certify bottles are analyte-free.
5. Initiate chain-of-custody.
6. Collect separate sample into a 120 milliliter (mL) plastic container to measure pH, conductivity, turbidity, and temperature in the field.
7. Record well sampling data field notebook and on the Well Development/Purging Log.

4.0 SAMPLE DOCUMENTATION

Each soil and groundwater sample will be logged in a bound field notebook by the technician or geologist. Field notes will include, but are not limited to the following:

- descriptions of subsurface material encountered during sampling,
- sample numbers and types of samples recovered, and
- date and time of sampling event.

The technician or geologist also completes a daily drilling or sampling record and chains-of-custody for all samples collected that are being transported to the laboratory. Once sampling program is complete, the geologist or technician transfers field notes/logs onto standard forms (e.g., boring logs, sampling logs, daily reports, etc.) to be included with the formal investigation report.

5.0 SAMPLING CONTAINER SELECTION

The selection of sample containers is based on the media being sampled and the required analysis. Container selection should be completed in advance of mobilizing into the field with close communications with the laboratory.

6.0 SAMPLE LABELING

The following procedure helps to prevent misidentification of samples and to clarify the location and purpose of environmental samples collected during the investigation:

1. Fix a non-removable (when wet) label to each container.
2. Wrap each sample bottle within 2-inch cellophane tape.
3. Write the following information with permanent marker on each label:

    A. Site name
    B. Sample identification
    C. Project number
    D. Date/time
    E. Sampler's initials
    F. Sample preservation
    G. Analysis required

Each sample is assigned a unique identification alpha-numeric code, such as RR-ss1 or WS-TP1 (2-3’), where the abbreviations represent RR – River Road (site), surface sample 1 and Waste Site, test pit 1, obtained at 2-3’ bgs. Other common abbreviations include the following:

- BH = Geoprobe Borehole
- SW = Surface Water
- SED = Sediment
- SB = Soil Boring
- MSB = Matrix Spike Blank
- NSS = Near Surface Soil (1' - 2' depth)
- EB = Equipment Rinse Blank
- HW = Hydrant Water (Decon/Drilling Water)
- GW = Groundwater
- TB = Trip Blank
- RB = Rinse Blank
- MS/MSD =Matrix Spike/Matrix Spike Duplicate

7.0 SAMPLE SHIPPING

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for (1) presenting analytical results in a legal or regulatory forum (e.g., evidence in litigation or administrative hearings), (2) minimizing loss or misidentification of samples, and (3) ensuring that unauthorized persons do not tamper with collected samples.

The following chain-of-custody guidelines should be utilized during sample collection as outlined in and prepared by the National Enforcement Investigations Center (NEIC) Policies and Procedures of the USEPA Office of Enforcement:

1. Complete chain-of-custody record with all relevant information.
2. Send original chain with the samples in a sealed, waterproof bag taped inside the sample cooler.
3. Place adequate inert cushioning material (e.g., corrugated plastic, polypropylene foam wrap, etc.) in bottom of cooler.
4. Place bottles in cooler so they do not touch (use cushioning material for dividers).
5. Place VOA vials in sealed/waterproof bags in the center of the cooler.
6. Pack cooler with ice in sealed/waterproof plastic bags.
7. Pack cooler with cushioning material.
8. Place any additional paperwork in sealed bag with original chain.
9. Tape cooler drain shut.
10. Wrap cooler with packing tape at two locations to secure lid. Do not cover labels.
11. Place lab address on top of cooler.
12. Ship samples via overnight carrier the same day that they are collected.
13. Label cooler with "This side up" on all sides and "Fragile" on at least two sides.
14. Fix custody seals on front right and left of cooler and cover with packaging tape.

8.0 SOIL VAPOR INTRUSION SAMPLING

Soil vapor intrusion (SVI) investigation consist of sampling contaminant vapors that may exist beneath the building slabs, inside the buildings, and outside the buildings. Sample collection includes the following procedures per New York State Department of Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

8.1 SUB-SLAB AIR SAMPLING PROCEDURES

8.1.1 Sampling Locations

Select the sub-slab sample collection points by observing the condition of the building floor slab for apparent penetrations such as concrete floor cracks, floor drains, or sump holes. The floor conditions will be noted, and potential locations of subsurface probes will be selected. The locations will ideally be away from the foundation walls, apparent penetrations, and buried pipes.

8.1.2 Sampling Probes

Construct a sampling probe using a ¼-inch Swagelok union connected to a short length of ¼-inch diameter stainless steel tubing. Select a length of stainless-steel tubing so that the bottom of the probe is close to but does not extend below the bottom of the slab (typically a 4-inch probe for a 6-inch thick slab).

Attach a 2 ft. length of Teflon or polyethylene tubing to the other end of the union using a ¼-inch Swagelok nut and ferrules. Plug up the other end of the tubing with a small piece of modeling clay to seal the system and prevent air flow in or out of the sub slab while the probe and tubing sits idle.

8.1.3 Installation of the Sampling Probe

Drill through and about 1-inch below the concrete slab using a portable coring drill and 2-inch diameter core drill bit. Record the thickness of the concrete slab. When installing the probe, first put a few inches of driller's sand at the bottom of the cored hole so that the grout will sit on top of the sand and not go all the way to the bottom of the hole and plug the probe inlet.

Install the probe into the hole, with the tubing already attached. Use the tubing to hold the union at the correct height in the hole (just below the top). Mix hydraulic cement and water is a ziplok bag. Cut a hole in one corner of the bag and use it like a pastry chef's bag to grout the probe in place. Use a small rod to push/tap in the grout. Leave the top 1-inch or so of the hole unfilled, being sure that the threaded top of the union (where the tubing attaches) is above the cement. Allow the probe to sit in place for at least one hour to allow the cement to set. If possible, install the probe one day and allow it to sit overnight.

8.1.4 Helium Tracer Gas Testing

Place a 2-quart (or similar size) bucket over the sample probe after threading the Teflon sample tube through a hole in the top of the bucket. Seal the tube to the bucket with clay. The bucket should also have another hole drilled in the top for the injection of helium, and a hole in the side near the floor for the measurement of helium gas concentrations.

Connect helium (99.999% pure) cylinder tubing to the top port of bucket enclosure and seal with clay or other sealing material. Insert a helium detector probe in the bottom port of the bucket. Release enough helium to displace any ambient air in the bucket until the concentration of helium reaches a minimum of 90%. Maintain this minimum concentration by testing with a helium detector. The Helium cylinder should be open during the purge time to cause a slight positive pressure within the enclosure.

Connect the sample tubing to a GilAir vacuum pump or equivalent using 3/8-inch O.D. silicone tubing. Connect a 1-liter Tedlar bag to the outlet of the pump using silicone tubing and collect a 1-liter sample. Purging flow rates must not exceed 0.2 liters per minute (L/min). Analyze the Tedlar bag for helium using a helium detector and record the results on the Summa Canister Data Sheet. A concentration of helium 10% or greater indicates a poor seal of the sample probe and it must be reinstalled and retested. After purging, remove the bucket enclosure from over the sample probe.

8.1.5 Sample Collection

Assign sample identification to the Summa canister sample identification tag and record on chain of custody (COC), and the Summa Canister Data Sheet. Also record the Summa canister and flow controller (regulator) serial numbers on the COC and Summa Canister Data Sheet. Attach a pre-calibrated/certified 2-hour flow controller, and particulate filter to the Summa canister. Attach the sample tube to the Summa canister using a ¼-inch Swagelok nut with appropriate ferrules, to the end of the flow controller/particulate filter assembly.

Open canister valve to initiate sample collection and record sample start time, date, and initial canister vacuum on the canister identification tag and on the Summa Canister Data Sheet. If the canister does not show sufficient vacuum (generally less than 25"Hg), do not use. Take a digital photograph of canister setup and surrounding area. Include in the photograph a dry erase board or similar display which presents sample ID, location, and date.

After 2 hours, record sample end time and canister pressure on the Summa Canister Data Sheet, and close valve. Disconnect the Teflon tubing and remove flow controller/particulate filter assembly from canister. Seal canister with laboratory supplied brass plug. Ship the samples, with COCs, overnight, to the selected laboratory for standard TO-15 analysis.

8.1.6 Removing the Sample Probe

If the probe is to be reused, remove the ¼-inch tubing, and place a Swagelok cap on the exposed part of the union. The cap should be flush or below the level of the floor. If the probe is not to be reused, remove the probe by drilling around the probe with a hammer drill and a ¼ or 3/8-inch drill bit until loose. Keep the tubing attached to the implant to aid in its removal. Fill the core hole with hydraulic cement.

8.2 INDOOR/OUTDOOR AIR SAMPLING PROCEDURES

Place the indoor air Summa canister/flow controller inlet at breathing height in the approximate center of the space being sampled, or, for the outdoor air sample, elevated on a table or other object in a location upwind of the building being sampled. The breathing height is defined as four to six feet above the floor or ground. As an option, a length of Teflon tubing can be attached to the Summa canister/flow controller inlet and raised to breathing zone height.

Record the canister and flow controller serial numbers on the canister identification tag, COC and the Summa Canister Data Sheet. Assign sample identification to the canister identification tag, and record on the COC and the Summa Canister Data Sheet. Remove brass plug from canister fitting and save.

Attach a pre-calibrated/certified 8-hour flow controller and particulate filter to the Summa canister. For the outside air sample, also connect the laboratory supplied “candy cane” fitting to the flow controller. Open canister valve to initiate sample collection and record start time, date, and gauge vacuum reading on the canister identification tag and on the Summa Canister Data Sheet. Take a photograph of canister setup and surrounding area.

After 8 hours, record the gauge vacuum reading, close the Summa canister valve completely and record the end time on the Summa Canister Data Sheet. There should still be a slight vacuum in the Summa canister. If no vacuum remains in the canister, or the canister does not show a significant net loss in vacuum after sampling, the sample should be re-collected using a new Summa canister and flow controller. Disconnect any tubing and candy cane fittings from the Summa canister and remove the flow controller. Replace the brass plug on the canister. Ship canister, with COCs, overnight, to the selected laboratory

8.3 QUALITY CONTROL

The number of Quality Control samples (duplicates) to be taken during sub-slab sampling may be found in the QA/QC Plan. The duplicate sample rate is usually 10 percent. Field duplicates for sub-slab, indoor air and outdoor air samples will be collected by attaching the T-fitting supplied by the laboratory to two Summa canisters with attached regulators. For sub-slab samples, the inlet of the T-fitting will then be attached to the sub-slab sample tubing using a Swagelok fitting. For indoor and outdoor air samples, any tubing used to raise the sampling height will also be attached to the inlet of the T fitting. For sampling, both Summa canister valves are opened and closed simultaneously.

8.4 SAMPLE LABELING

Each sub-slab sample should have the following information at a minimum placed on the laboratory supplied sample label:

- Site name
- Sample identification – see below
- Date/time
- Sampler's initials
- Analysis required – **TO-15**

The serial number of the canister and regulator used during sampling is also noted on the Summa canister identification tag and on the COC. Each sub-slab, indoor air and outdoor air sample will be assigned a unique alpha-numeric code. An example of this code and a description of its components are presented below. Field duplicate samples will be assigned a unique identification alphanumeric code that specifies the date of collection, the letters FD (for field duplicate) and an ascending number that records the number of duplicate samples collected that day. For example, the first field duplicate collected on February 22, 2009 would be assigned the sample number in the format YYYYMMDD-FD-1 = 20090222-FD-1.

Subsequent duplicates collected on the same day will be assigned FD-2, FD-3 etc. Field sampling crew will record the duplicate sample information on the Summa Canister Data Sheets and in the field book.

8.5 FIELD DOCUMENTATION

Field notebooks are used during all on-site work. A dedicated field notebook is maintained by the field technician overseeing the site activities. Sub-slab sampling procedures should be photo-documented. The field sampling team will maintain sampling records that include the following data:

- Sample Identification
- Date and time of sample collection
- Identity of samplers
- Sampling methods and devices
- Purge volumes (soil vapor)
- Volume of soil vapor sample extracted
- The Summa canister vacuum before and after samples collected
- Chain of Custody and shipping information

The proper completion of the following forms/logs is considered correct procedure for documentation during the indoor air-sampling program:

1. Field Logbook – weather-proof hand-bound field book
2. Summa Canister Data Sheet
3. Chain of Custody Form

8.6 SAMPLE SHIPPING

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The following chain-of-custody guidelines should be utilized during sample collection as outlined in and prepared by the National Enforcement Investigations Center (NEIC) Policies and Procedures of the USEPA Office of Enforcement:

- Complete the COC record with all relevant information.
- Ship original COC with the samples in a sealed waterproof plastic bag and place inside the box containing a Summa canister.
- Retain a copy of the COC for field records.
- Ship Summa canisters in the same boxes the laboratory used for shipping.
- Place the lab address on top of sample box/cooler.
- Fix numbered custody seals across box lid flaps and cooler lid.
- Cover seals with wide, clear tape.
- Ship samples via overnight carrier within three days of sample collection if possible.

APPENDIX D

CITIZEN PARTICIPATION PLAN

CITIZEN PARTICIPATION PLAN

Harrison Place
Northwest Corner - Intersection of South & Washburn Street
Lockport, New York
Tax Map ID No.: P/O 109.14-4-20.1
Property County: Niagara
Site No.: C932177

Prepared for:

The Kearney Realty & Development Group Inc.
57 US Route 6, Suite 207
Baldwin Place, NY 10505

Prepared by:

BE3 CORP
BRYDGES ENGINEERING IN ENVIRONMENT & ENERGY
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Buffalo, New York 14213

December 2020

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<u>Attachments</u>

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

1.0 What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

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

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

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

2.0 Citizen Participation Activities

Why NYSDEC?

Involves the Public and Why It Is Important

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

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

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment
- Improving public access to, and understanding of, issues and information related to a site and that site's investigation and cleanup process
- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process
- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community
- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

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

Project Contacts

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

Locations of Reports and Information

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

Site Contact List

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

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- Location (s) of reports and information.

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

CF Activities

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

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

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information. This CPP maybe revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities.

Technical Assistance Grant

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

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

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site. For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

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

CITIZEN PARTICIPATION ACTIVITIES	TIMING OF CP ACTIVITIES
Application Process	
• Prepare site contact list • Establish document repositories • Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	At time of preparation of application to participate in the BCP. When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement	
• Prepare Citizen Participation Plan (CPP)	Before start of Remedial Investigation
Before NYSDEC Approves RIWP	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined, and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes RI	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves RAWP	
• Distribute fact sheet to site contact list about proposed RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five-day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that summarizes the Final Engineering Report • Distribute fact sheet to site contact list announcing issuance of Certificate of Completion (COC)	At the time NYSDEC approves Final Engineering Report. These two fact sheets are combined if possible if there is not a delay in issuing the COC.

3.0 Major Issues of Public Concern

This section of the CPP identifies major issues of public concern as they relate to the site Additional major issues of public concern may be identified during the site's remedial process.

At this juncture the public has not identified major concerns with the project. In the event major concerns are expressed, future communication addressing those concerns will be issued to stakeholders.

4.0 Site Information

Note: please refer to the BCP Application and RIWP (and corresponding appendices) for more detailed information on the Site. Below is a summary of Site description, future use of Site, historical use of Site, and Site environmental history.

Site Description

The Harrison Place (Site) is Building No. 3 of the former Harrison Radiator factory complex. The 475,000-square foot facility, consisting of a 5-building complex, is bounded by Walnut, Washburn, South, and Locust Streets in the City of Lockport, New York. The project site, Building No. 3, is located in the southeast corner of the former factory at the northwest corner at the intersection of South & Washburn Street which is just south of Main Street in downtown Lockport, the county seat of Niagara County, New York.

Future Use of the Site

The Kearney Realty & Development Group Inc. has entered the BCP to remediate the site for the redevelopment of the property that includes redevelopment into a multi-unit apartment building with first floor neighborhood commercial uses that support the building tenants and community.

History of Site Use

The former factory complex is currently referred to as Commerce Square. At present, most of the building space is vacant, although portions are used by several small businesses and for storage.

The Commerce Square site was used from 1914 to 1987 by the Harrison Radiator Division of General Motors Corporation. The facility was used for the manufacture of copper and brass automobile parts including thermostats, vacuum and electrical switches, modulators, and heat exchangers. Processes reportedly included: metal pressing; metal stamping and forming; metal finishing and assembly; tin and lead soldering and brazing; parts washing and degreasing; injection molding; painting; heat treating; tool design; and quality control testing. At the time of plant closure, most of the equipment, materials, and other items were reportedly removed and either sold or transferred to another Harrison Radiator facility.

The 475,000-square foot facility consisting of 5 buildings. Generally, the property was used from 1914 to 1987 (70 years) by Harrison Radiator Division. Building Nos. 2 and 3 are interconnected 3-story former manufacturing buildings. Building No. 4 is a three-story structure that was used for research and development, testing, and office space. Building No. 1 contained offices, meeting rooms, cafeteria and other support areas. Building No. 1A is a small separate section on the western end of Building No. 3 which had offices and security.

Building floors are constructed of wood, concrete, or asphalt-coated concrete. Process equipment was typically installed above concrete collection sumps, however, site closure inspection reports identified that floors were stained and contained metal shavings and other items in some locations. The final site inspection reports during site closure completed by O'Brien & Gere in 1987 and 1988 (*Environmental Audit and Closure Evaluations. Prepared by O'Brien & Gere for Harrison Radiator Division, May 1987 and Harrison Radiator Asbestos Removal - Phase I Buildings 1, 2, and 3 prepared by O'Brein & Gere for Harrison Radiator, April 12, 1988)* indicates that a very thorough facility closure was completed by Harrison Radiator at that time. The facility closure included removal of all equipment, piping, and ductwork; solids were removed; chemical inventories were removed; sumps, pits and sewers were cleaned; and asbestos was removed. According to the plant 1987 closure report, prior comprehensive environmental audits performed in 1977, 1981, and 1985, identified only minor problems. The facility wastewater discharges to the combined sanitary/process sewer which is part of the City of Lockport municipal system.

Building No. 3 is the subject of this BCP. Building No. 3 was the main production and assembly building for Harrison Radiator. It is a three-story structure with an open, full height center section, which runs the full length of the building. This open center section contains an overhead crane, which is located directly beneath a continuous skylight. The second and third floors of Building No. 3 are located on the north and south sides of the building with the high-bay, skylight down the center. Building No. 3 has a series of vertical columns on both the north and south sides of the building which support the upper floors, but otherwise the building is completely open. The concrete floor is generally level, and any previous floor drains, pits, or other building features have since been filled and leveled. In general, the concrete floor of Building No. 3 was 6 to 12 inches thick at the boring locations. However, certain areas of the floor within this building were thicker than 12 inches. Floor coring at several locations within Building No. 3 was attempted and abandoned after reaching the maximum depth of the portable coring machine (approx. 18 inches). These thicker floor locations may have corresponded with building footers, or with the former walls of unknown sub-grade features. A small basement area is located in the southwest corner.

The property has a history of subsurface petroleum storage mostly located west of Building No. 2 in the alley, however at least three tanks were located west of Building No. 3.

5.0 Remedial Cleanup Process

Application

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

The Applicant in its Application proposes that the site will be used for residential/restricted residential purposes. To achieve this goal, the Applicant will conduct investigation and/or cleanup activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement (BCA) to be executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will complete a RI as part of the BCP. NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a significant threat, it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Remedy Selection

The Applicant will recommend in its application that action needs to be taken to address site contamination. Pending approval of the investigation report by the NYSDEC, the Applicant has proposed a remediation of impacted soil to meet at least restricted residential use.

The RI results will help develop a remedial approach which may include an IRM. When the Applicant submits the proposed Remedial (IRM) Work Plan for approval, NYSDEC will announce the availability of the proposed plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments and revise the draft Remedial (IRM) Work Plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

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

Certificate of Completion

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

Site Management

Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicant under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

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

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

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

Attachment A

Project Contacts and Locations of Reports and Information

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

New York State Department of Environmental Conservation (NYSDEC):

Joshua M. Vaccaro
Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Ave. Buffalo, NY 14203
P: (716) 541-9657| F: (716) 851-7226
joshua.vaccaro@dec.ny.gov
Region 9 Email: region9@dec.ny.gov

Kristen Davidson
Citizen Participation Specialist Division of Public Affairs
270 Michigan Avenue
Buffalo, New York 14203
(716)-851-7220
Kristen.Davidson@dec.ny.gov

New York State Department of Health (NYSDOH):

Angela Martin
New York State Department of Health
Bureau of Environmental Exposure Investigation
Empire State Plaza
Corning Tower Room 1787
Albany, NY 12237
Angela.Martin@health.ny.gov

Public Repository for Reports and Information:

Beverly J. Federspiel
Lockport Public Library
Executive Director
23 East Avenue
P.O. Box 475
Lockport, NY 14095-0475

Attachment B

Site Contact List

1. Chief executive officer and planning board chairperson for municipalities property is located

Municipal Agencies

Niagara County Planning Board
6311 Inducon Corporate Drive
Sanborn, New York 14132
Phone: (716) 278-8750
Fax: (716) 278-8757
Email: amy.fisk@niagaracounty.com

City of Lockport Planning and Development
Carrie Gugliuzza, Program Administrator
Lockport Municipal Building
One Locks Plaza
Lockport, New York 14094
716.439.6686
cgugliuzza@lockportny.gov

Local School District
Lockport City School District
130 Beattle Avenue
Lockport, New York 14094
(716) 478-4700 (tel)

2. Residents, owners, and occupants of the property and properties adjacent to the property.

Property

1. The Kearney Realty & Development Group Inc.
57 US Route 6, Suite 207
Baldwin Place, NY 10505

2. Mancuso Group
Edla Collora - 716-440-7507
edla@mancusogroup.com

Adjacent Properties

Because the remnant of the factory occupies substantial space north and west of the Project Site, tax lots east across Washburn St and South across South St as well as southeast across the intersection will be notified of this proposal as follows:

South Across South St
1. 210 Washburn St
First African Methodist Episcopal Church

2. 115 South St
Marie E Papachatzis

3. 113 South St
Michael Robinson

East (Bldg #7 and across Washburn St)
Adjacent east is Bldg #5 of the factory which is a much smaller two-story structure with two occupants. Fredwahl, Inc. and Niagara Community Action Program, Inc. 160 Washburn St.

beyond Washburn are the following owners/occupants:

1. 177 Washburn St
181 Washburn St
189 Washburn St
Centennial Development Ltd

2. 185 Washburn St
Elmer Granchelli

3. 193 Washburn St
TAECS LLC

Southeast across the intersection
1. 205 Washburn
Robert Craft

2. 207 Washburn
Moses Galab

Any other entities that express interest in the project will be added to this mailing list.

3. Local news media from which the community typically obtains information

Local News Media
Lockport Union-Sun & Journal
135 Main Street
Lockport, New York 14094
Connor Hoffman
(716) 439-9222 ext 6239

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

Local Water Department/ Water Authority
Lockport Water Department

1 Locks Plaza
Lockport, New York 14094
(716) 439-6678 (tel)

5. Any person requested to be placed on the list

None.

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

7. The location of a document repository for the project (e.g., local library)

Beverly J. Federspiel
Lockport Public Library
Executive Director
23 East Avenue
P.O. Box 475
Lockport, NY 14095-0475

8. Community boar in a city with a population of one million or more.

Not applicable.

Attachment C

BCP Process Flowchart

Brownfield Cleanup Program (BCP)
Application Process