Draft Remedial Investigation Work Plan

For

Churches United For Fair Housing (CUFFH) Offices

276-284 Starr Street, Borough of Brooklyn

Block 3200, Lot 19

NYSDEC Site No. 224430

Prepared for:

Churches United For Fair Housing

7 Marcus Garvey Boulevard

Brooklyn, NY 11206

rsolano@cuffh.org

Prepared by:

Liberty Environmental

600 Third Avenue, Second Floor

New York, NY 10016

jcinelli@libertyenviro.com

800.305.6019

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CERTIFICATION

I, James P. Cinelli, certify that I am currently a New York State-licensed Professional Engineer and that this Remedial Investigation Work Plan (RIWP) was prepared in accordance with all applicable statutes and regulations and substantial conformance with New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).

James P. Cinelli, P.E., P.G.
Name

079794
PE License Number

DRAFT
Signature

7-14-2025
Date

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LIST OF ACRONYMS

Acronym	Definition
111-TCA	1,1,1-Trichloroethane
11-DCE	1,1-Dichloroethene
ASP	Analytical Services Protocol
AOC	Area of Concern
BCP	Brownfield Cleanup Program
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethyl Benzene, and Xylenes
C12-DCE	Cis-1,2-Dichloroethene
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CSCO	Commercial Soil Cleanup Objective
CVOC	Chlorinated Volatile Organic Compounds
EDD	Electronic Data Deliverable
DER	Division of Environmental Remediation
DUSRs	Data Usability Summary Reports
ESA	Environmental Site Assessment
ELAP	Environmental Laboratory Accreditation Program
GPR	Ground Penetrating Radar
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCBs	Polychlorinated Biphenyls
PCE	Perchloroethylene/Tetrachloroethene/Tetrachloroethylene
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PGWSCO	Protection of Groundwater Soil Cleanup Objective
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RI	Remedial Investigation
SCOs	Soil Cleanup Objectives
SSDS	Sub-Slab Depressurization System
SVOCs	Semi-Volatile Organic Compounds
T12-DCE	Trans-1,2-Dichloroethene
TCE	Trichloroethene/Trichloroethylene
USDA	United States Department of Agriculture
UST	Underground Storage Tank
UUSCO	Unrestricted Use Soil Cleanup Objectives
TAL	Target Analyte List
VC	Vinyl Chloride
VOCs	Volatile Organic Compounds
WQS	Water Quality Standard

1 INTRODUCTION

The following Remedial Investigation Work Plan (RIWP) was prepared by Liberty Environmental (Liberty) on behalf of Churches United for Fair Housing (referred to herein as CUFFH or the Requester) relative to the necessary remediation of the real property located at 276-284 Starr Street, Brooklyn, New York (herein referred to as the "Site" or "Property"). The Requester has applied to enter the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER), Brownfield Cleanup Program (BCP) per Title 6 of the New York State Official Compilation of Codes, Rules, and Regulation (NYCRR) Part 375-3.4 as Volunteers as defined in ECL 27-1405(1)(b).

1.1 PROJECT OBJECTIVES

The Requesters intend to enter into the BCP to conduct a remedial investigation and implement remedial actions as part of the redevelopment process. The previous investigations performed at the Site provided a preliminary understanding of the Contaminants of Concern (COCs), specifically, Chlorinated Volatile Organic Compounds (CVOCs) in soil vapor and indoor air. The objective of this RIWP is to collect sufficient quantity and quality data to fully characterize the nature and extent of the impacted media beneath the Site. Data collected during this RI will be utilized to develop a remedial design and the remedial activities under the BCP. This RIWP is being submitted in conjunction with the BCP application and a Remedial Action Work Plan.

1.2 SCOPE OF WORK

The RIWP describes the project objectives, details the Site information, relevant historical background, previous Site investigations, and describes field methodologies that will be employed during the subsurface investigation. This RIWP was prepared by Liberty for the Site in general accordance with the NYSDEC *Technical Guidance for Site Investigation and Remediation (DER-10)*, dated May 2010. Appended to this RIWP are plans that detail the site-specific protocols to be followed during the investigation work, which include a Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) (Appendix A), a Health and Safety Plan (HASP) (Appendix B) and a Community Air Monitoring Plan (CAMP) (Appendix C).

2 PHYSICAL SITE CHARACTERISTICS

2.1 SITE DESCRIPTION

The Site is located in the Bushwick section of Brooklyn, New York and is identified as Block number 3200 and Lot number 19 on the New York City Tax Map. A Site Location Map is provided as Figure 1. The lot area is 8,000 square feet and the Property is bounded by Starr Street to the northwest, residential properties to the northeast, commercial stores and warehouses to the southeast (FM Consolidated Holding Corp.), and a commercial building to the southwest (First F&L Realty LLC). A Site Boundary Map is provided as Figure 2, and a Surrounding Area Map is provided as Figure 3. The lot has 80 feet of street frontage along Starr Street and is improved with a partial two-story commercial building with a gross square footage of approximately 13,500 square feet. The building was constructed in 1931, and the current zoning for the Site is M1-1 (Light Manufacturing). The Site is generally flat to gently sloping. No surface water bodies are located on or adjacent to the Site. The building was most recently operated as an antique store and fitness studio.

2.2 SITE HISTORY

According to a prior Phase I Environmental Site Assessment (ESA) prepared by BBG Assessments, LLC (BBG), the Site was undeveloped until 1920, when the current building was constructed. In 1933 the building was operated by a store fixture manufacturer and from 1937 through 1965 the building was occupied by a machine shop (Queens Machine Corporation). From 1970 through 2008 the property was occupied by garment companies including Quarex Knitting Mills (1970 to at least 1973) and PJ Knitting Mills (1985 to 2008).

2.3 PRIOR INVESTIGATIONS

The following investigations were previously conducted at the Site:

- *Phase I ESA, prepared by BBG, June 2022*
- *Limited Phase II Subsurface Investigation, prepared by BBG, July 2022*
- *Phase II Site Investigation, prepared by Liberty, April 2024*

2.3.1 Phase I ESA by BBG, June 2022

The subject property was the subject of a June 2022 Phase I ESA by BBG. The Phase I ESA scope of work was performed in accordance with ASTM Standard Practice E1527-13 and E1527-21, and included reviews of historical site development records, historical site operations records, environmental databases, and other source materials relevant to the identification of recognized environmental conditions (RECs) on the subject property. At the time of the 2022 Phase I ESA, the subject property was occupied by an antique goods store and a martial arts gym.

BBG's Phase I ESA identified several prior industrial uses of the site dating to its original development with the current site building in 1920. These included the manufacturing of store fixtures, a machine shop (Queens Machine Corporation), and knitting mills. Based on this

information, BBG identified the historical operations as an REC due to the likelihood that petroleum products or hazardous substances (e.g. solvents or degreasers) had been stored, managed or generated on the property, and since the potential for leaks, spills or discharges of these materials could not be ruled out. BBG also identified a vent pipe on the front (northern) façade of the building facing Starr Street. Due to the density of stored materials within the basement, the current or former presence of an aboveground storage tank (AST) or underground storage tank (UST) could not be fully evaluated, and the vent pipe was therefore identified as an REC. BBG recommended that these RECs be further evaluated through a Phase II Site Investigation.

In addition to the RECs noted above, BBG identified the presence of a hydraulic-driven freight elevator within the building as a business environmental risk (BER). BBG recommended that any residual hydraulic oils within the elevator's lift system be removed for proper disposal. Also, BBG identified the potential presence of asbestos-containing materials and lead-based paint based on the known age of the building but identified these issues as non-scope items outside of the evaluation criteria of ASTM Standard Practice E1527-13 and -21.

2.3.2 Limited Phase II ESA by BBG, July 2022

In July 2022, BBG performed a limited Phase II Site Investigation at the Property, consisting of sub-slab vapor sampling and ambient indoor air sampling within the 280–284 Starr Street portion of the building. Sub-slab vapor samples were collected from the first floor and the partial basement of the antiques store portion of building. Indoor air samples were collected from the same locations as the sub-slab samples, and an outdoor ambient air sample was also collected for the purpose of establishing a background reference. Samples were submitted for laboratory analysis of solvent-based volatile organic compounds (VOCs). The vapor investigation was performed in accordance with New York State Department of Health (NYSDOH) *Guidance for Evaluating Soil Vapor Intrusion* (2006); (referred to herein as NYSDOH Final VI Guidance).

The results of the sub-slab sampling identified detectable concentrations of six VOCs (Cis-1,2-DCE, TCE, PCE, 1,1,1-TCA, methylene chloride, and carbon tetrachloride). Of these, three compounds (Cis-1,2-DCE, TCE and PCE) were reported at concentrations above their respective NYSDOH Final VI Guidance Mitigation Levels (i.e. guidance thresholds for mitigation, regardless of their concentrations in ambient indoor air). TCE was observed in the sub-slab samples from the partial basement at concentrations several orders of magnitude greater than its NYSDOH Final VI Guidance Mitigation Level of 60 ug/m^3. Of the ambient air samples, TCE was reported in three samples above its NYSDOH Final VI Guidance Mitigation Level of 1.0 ug/m^3. Benzene, a petroleum VOC solvent typically associated with petroleum hydrocarbon products, was also observed in the sub-slab and ambient air samples at concentrations which exceed it US Environmental Protection Agency (USEPA) residential Vapor Intrusion Screening Levels for sub-slab and indoor air of (VISL) of 12.0 ug/m^3 and 0.36 ug/m^3, respectively.

BBG concluded in its Limited Phase II Site Investigation Report that, based on the findings of the sub-slab and indoor air sampling, a vapor intrusion condition exists at the Site, which is likely

the result of a release of solvents through its historical operations. BBG further recommended that vapor mitigation be implemented.

BBG's Limited Phase II Site Investigation also included further evaluation of the apparent storage tank vent pipe along the northern façade of the building. The vent pipe was traced to the basement interior, where it penetrated the slab floor in the partial basement below the antiques shop. No further visual or geophysical detection could be performed due to the density of debris within this portion of the building. Based on this information, BBG recommended further evaluation for the presence of a current or former tank once the basement could be cleared of staged materials.

In April 2023, an affidavit describing the closure of a 1,080-gallon fuel oil tank was identified in property records. The affidavit states that the work was completed in April 2001 by Vito Valentini of Kings Boilers, Inc. and included the purging and permanent sealing of the tank (i.e., closed-in-place).

2.3.3 Phase II ESA by Liberty, April 2024

In April 2024, Liberty performed supplemental Phase II ESA activities in the 280–284 Starr Street portion of the Site building which included the collection of two indoor air samples from the first floor and one indoor air sample from the partial basement. The samples were analyzed for VOCs and CVOCs via EPA Method TO-15. Both indoor air samples from the first floor contained TCE at concentrations above the NYSDOH Final VI Guidance Mitigation Level of 1.0 ug/m^3 (2.3 ug/m^3 and 2.4 µg/m^3). The indoor air sample from the partial basement also contained TCE (34 µg/m^3) and toluene (59 µg/m^3) at concentrations above their NYSDOH Final VI Guidance Mitigation Levels of 1.0 µg/m^3 and 50 µg/m^3, respectively. Additionally, cyclohexane was present in all indoor air samples at concentrations ranging from 25 µg/m^3 to 48 µg/m^3, which exceed the NYSDOH Final VI Guidance Mitigation Level of 10.0 ug/m^3. Several other VOCs were detected in the indoor air samples, but concentrations were below their respective NYSDOH Final VI Guidance Mitigation Level. Based upon the results of the indoor air sampling activities, Liberty recommended that *vapor* intrusion mitigation be performed.

2.4 AREAS OF CONCERN

Based on the Site history and the findings of previous studies, the Areas of Concern (AOCs) to be further investigated during the RI are described below:

AOC-1 – CVOC and VOC Impacted Soil Vapor and Indoor Air

Previous environmental investigations have identified the presence of elevated levels of various CVOCs and VOCs including Cis-1,2-DCE, TCE, PCE, benzene and cyclohexane in soil vapor and/or indoor air at the Site. The RI will focus on identification and delineation of impacted media acting as the source(s) of the soil vapor and indoor air.

AOC-2 – Abandoned Heating Oil UST

Previous environmental investigations revealed that a 1,080-gallon fuel UST was previously closed-in-place below the floor of the building's partial basement. There are no records regarding environmental sampling or the environmental condition of soil surrounding the UST at the time of closure. The RI will include activities to assess soil and groundwater quality near the former UST.

2.5 SURROUNDING LAND USE

The Site is located between St. Nicholas Avenue and Wycoff Avenue with frontage along Starr Street. The NYC Tax Block (3200) is a rectangular-shaped block that is surrounded by St. Nicholas Avenue, Willoughby Avenue, Wycoff Avenue and Starr Street. Neighboring properties include residential properties to the northeast, commercial stores and warehouses to the southeast (FM Consolidated Holding Corp.), and a commercial building to the southwest (First F&L Realty LLC). According to the NYC Planning Commission Zoning Map, the Site is located in an M1-1 light manufacturing district.

2.6 PROPOSED REDEVELOPMENT/PROJECT DESCRIPTION

This project is to investigate and remediate the Site through the NYSDEC BCP. The redevelopment activities will not involve any new construction or modification of the buildings structure, other than the installation of new interior fitments and furnishings (e.g., carpeting, work cubicles, lighting).

3 ENVIRONMENTAL AND PHYSIOGRAPHIC SETTING

3.1 REGIONAL PHYSIOGRAPHY

Based on a review of the U.S. Geological Survey topographic map, Brookyln Quadrangle, New York, 7.5-minute series, 2023, the Site is situated at an approximate elevation of 35 feet above mean sea level (amsl) based on the North American Vertical Datum of 1988 (NAVD88). The topographic gradient near the Site slopes gradually to the west. The nearest water body is Newtown Creek, which is located approximately 2,500 feet west/northwest of the Site and flows north and west to the East River, which is located approximately 2.5 miles west of the Site.

3.2 GEOLOGIC, HYDROGEOLOGIC AND HYDROLOGIC CONDITIONS

Based on the US Department of Agriculture Soil Conservation Services Web Soil Survey, overburden at the Site consists of Urban Land, till substratum, with 3 to 8 percent slopes (UtB).

Based on the 1994 US Geological Service (USGS) publication, Bedrock and Engineering Geologic Map of New York County and Parts of Kings and Queens counties, New York, and Parts of Bergen and Hudson Counties, New Jersey (Baskerville 1994) and the USGS online database, surficial geology bedrock near the Site is categorized as an unconsolidated sequence of glacial and alluvial deposits from the Quaternary era overlying the Middle Ordovician-age to Lower Cambrian-age Hartland Formation. The Hartland Formation consists of interbedded gray and gray to black weathering, muscovite-biotite-quartz schist; white to pinkish white, gneissic quartz-microcline-muscovite-biotite-plagioclase granite; and dark-greenish-black quartz-biotite-hornblende amphibolite. Based on the 2023 USGS publication, Bedrock Surface Elevation and Overburden Thickness Maps of the Five Boroughs, New York City (DeMott, et al. 2023), we anticipate bedrock to be encountered at a depth between 250 to 300 ft bgs.

The estimated depth to groundwater at the Site is between approximately 15 to 25 ft bgs. Based on local topography and surface water flow patterns, the inferred direction of groundwater flow is west/northwest toward Newtown Creek; however, the localized direction of groundwater flow near the Site might vary because of underground utilities, subsurface preferential pathways, variations in weather, or heterogeneous geological and/or anthropogenic conditions.

3.3 HISTORICAL ENVIRONMENTAL SAMPLING RESULTS

Information from the BBG and Liberty Phase II investigations identified several contaminants of concern in soil vapor and indoor air that may be attributed to the historical manufacturing activities at the site and/or adjacent properties. The laboratory analytical results for soil vapor and indoor air samples were evaluated using decision matrices A through F of the NYSDOH Final Guidance (revised February 2024). The primary contaminants of concern (COCs) include the CVOCs cis-1,2-dichloroethylene (c12-DCE), TCE and PCE and the petroleum VOCs cyclohexane and toluene. The historical soil vapor and indoor air data are summarized in Table 1. Laboratory reports for the historical soil vapor and indoor samples are provided in Appendix D.

Soil Vapor and Indoor Air Chemistry

Four soil vapor samples, seven indoor air samples, and one outdoor ambient air sample were collected during the BBG and Liberty investigations. Soil vapor samples showed elevated detections of the CVOCs cis-1,2-dichloroethylene (max of 460 ug/m^3, PCE (max of 1,180 ug/m^3), and TCE (max of 48,300 ug/m^3). Indoor air/outdoor showed elevated detections of the petroleum VOCs cyclohexane (max of 48 ug/m^3) and toluene (max of 59 ug/m^3) and the CVOC TCE (max of 34 ug/m^3).

A spider diagram showing the soil vapor and indoor air concentrations of the Individual COCs is included as Figure 4.

4 REMEDIAL INVESTIGATION

The proposed Remedial Investigation (RI) field program will focus on collecting additional soil, groundwater, soil vapor and indoor air data to delineate and characterize the property. The scope of the RI will include the collection of sufficient Site investigation data so that the entire Site will be sufficiently characterized to support the development of the Site-wide Remedial Action Work Plan (RAWP).

To accomplish this, the scope of work for the RI will include the following:

- The advancement of soil borings, collection of soil samples, installation of permanent groundwater monitoring wells, collection of groundwater samples from new monitoring wells, installation of soil vapor points, and sampling of new soil vapor points and indoor air;
- The collection of soil, groundwater, soil vapor and indoor air data sufficient to define the nature and extent of impacted media and current Site conditions and offsite groundwater and/or soil vapor migration potential;
- The collection of a synoptic round of groundwater level measurements and the collection of well casing elevation data as needed for developing a groundwater elevation contour map; and
- The performance of a Qualitative Human Health Exposure Assessment (QHHEA) to identify existing and potential exposure pathways and evaluate contaminant fate and transport.

The proposed scope of work includes the following:

<u>Soil</u>

- Advancement of 12 soil borings (designated SB-1 through SB-12) to a maximum depth of 12 ft bgs.
- Collection and laboratory analyses of two soil samples from each boring for a total of 20 soil samples. One sample from fill located 0-2 ft bgs and from the interval of highest impacts based on visual/olfactory senses and/or photoionization detector readings.

<u>Groundwater</u>

- Five of the soil borings (SB-3, SB-6, SB-10, SB-11 and SB-12) will be converted to permanent monitoring wells. The five borings will be drilled down to an estimated depth of 30 ft bgs using auger drilling techniques and converted to permanent monitoring wells.
- Gauging and development of the permanent monitoring wells.
- Collection and laboratory analyses of five groundwater samples for the newly installed wells.
- Elevation survey of all well locations.

<u>Soil Vapor Investigation</u>

- Installation of six Vapor Pins in the building and partial basement floor slabs.

- Collection and laboratory analyses of six soil vapor samples (SV-1 through SV-6).

- Collection and laboratory analyses of six indoor air samples co-located with the soil vapor samples (IA-1 through IA-6) and one outdoor ambient air sample (OA-1).

The remedial investigation will be conducted in accordance with the applicable requirements of NYSDEC document DER-10, *Technical Guidance for Site Investigation and Remediation*, (2010-revised 2019). The data will be produced in accordance with the New York State Department of Health (NYSDOH) Analytical Services Protocol (ASP) Category B deliverables and will be reviewed and validated by an independent data validator. The data validator will prepare a Data Usability Summary Report (DUSR) before data is incorporated into the RIR for the Site. All data will be submitted to NYSDEC in electronic format, in accordance with DER-10.

The sample summary and rationale are provided in Table 2. The proposed sample locations are shown in Figure 5. The following sections describe the methods, rationale, and proposed sampling schedule for the soil investigation activities summarized above. Sampling will be performed in accordance with the QAPP/FSP presented in Appendix A.

4.1 UTILITY CLEARANCE AND SUSPECTED FORMER UST AREA EVALUATION

A geophysical survey will be completed at all proposed drilling locations and across the entire partial basement to scan the shallow subsurface for the presence of anomalies (e.g., underground storage tanks and associated piping, utilities, and foundation slabs) and clear the proposed drilling locations. The geophysical survey will include one or more of the following techniques to assist in detecting subsurface anomalies: Ground Penetrating Radar (GPR), electromagnetic surveys and/or subsurface utility surveys. Anomalies detected by the geophysical survey will be marked with spray paint and/or chalk/flags. A written geophysical survey report and figure will be appended to the Remedial Investigation Report (RIR).

Additionally, a mark-out of underground utility lines will be performed prior to the start of fieldwork by calling the New York City One-Call Center. A utility mark-out verification reference number for the Site will be obtained and a record of the utilities will be kept (e.g., Con Ed, Cablevision, etc.).

4.2 SOIL INVESTIGATION

As shown in Figure 5, Liberty proposes to advance 12 soil borings (designated as SB-1 to SB-12) across the property. The borings will be performed under field observation of a Liberty geologist or scientist. Soil samples will be obtained with a 5-foot steel MacroCore^{TM} sampler using disposable acetate liners. The MacroCoreTM sampler will be advanced through the subsurface to collect representative soil samples down to a maximum depth of 12 feet bgs. If refusal is encountered in a soil boring due to subsurface obstructions (e.g., boulders, construction, and fill debris) above the

target depth, the drillers will attempt up to two off-set locations for each boring location. An example soil boring log is included in Appendix E.

Liberty's drilling contractor will collect soil cores continuously from grade to the target depth and Liberty will observe/document the soil samples for staining and soil characteristics. Liberty will screen the soil samples for total organic vapors with a hand-held, photoionization detector (PID) with an 11.7 eV bulb (capable of detecting CVOCs) and record lithological descriptions of the soil and field screening results on the soil boring logs. Liberty's visual inspection and soil boring logs will also document evidence of contamination including staining and/or odors.

The Liberty field representative will retain selected samples for laboratory analyses from the soil cores that indicate the comparatively highest impacts based on visual, olfactory, and PID screening results, and/or based on our evaluation of relevant Site features and conditions. Liberty will collect two discrete grab soil samples each from borings SB-1 through SB-10 (totaling 20 soil samples). Soil cores from borings SB-11 and SB-12 will be examined, field screened and logged; however, no samples will be collected from these borings unless obvious soil impacts are observed. Soil samples will be collected in compliance with EPA Method 5035 from the shallow fill material underlying the Site and from the 6-inch interval with the highest visual, olfactory and PID evidence of environmental impacts. The soil samples will be analyzed for the following parameters:

- NY Code Title 6 Section 375-6.8 List (Part 375 List) VOCs and EPA Target Compound List (TCL) VOCs by U.S. EPA methods 8260C and 5035,
- Part 375 List SVOCs and TCL SVOCs by EPA method 8270D,
- Part 375 List PCBs by EPA method 8082A,
- EPA Target Compound List (TCL) and Part 375 List metals by EPA methods 6010C, 7471B, 9010C, and 196A,
- Part 375 List Pesticides and herbicides by EPA methods 8081B and 8151A, and
- NYSDEC List PFAS by EPA method 1633.

All samples will be labeled, sealed, and placed in a cooler for shipment under standard chain-of-custody protocol to a NYSDOH Environmental Laboratory Approval Program (ELAP)-laboratory.

4.3 GROUNDWATER INVESTIGATION

As shown in Figure 5, Liberty proposes to install permanent groundwater monitoring wells at five of the soil boring locations (SB-3, SB-6, SB-10, SB-11 and SB-12). Following the completion of soil sampling activities at each proposed permanent well location, Liberty's drilling contractor will utilize auger drilling techniques to advance 6-inch diameter boreholes to groundwater which is estimated to be 15 to 25 feet bgs. Liberty will screen the drill cuttings for total organic vapors with a hand-held PID and record lithological descriptions of the cuttings, depth to groundwater and field screening results on monitoring well logs. The boreholes will be advanced at least 5 feet below the depth where groundwater is first encountered. The monitoring wells are anticipated to

be screened from approximately 15 to 30 ft bgs; however, the screened intervals will be field determined based upon the depth that groundwater is encountered. Each well will consist of a 2-inch diameter PVC riser and at least 10 feet of 0.01-inch slotted 2-inch diameter PVC screen. A 2-foot hydrated bentonite plug will be placed above the filter pack. The remaining annular space will be filled with bentonite. The wells will be completed with a flush-mount manhole and locking cap. An example of a monitoring well construction log is provided in Appendix E.

Well Development

Following installation, the groundwater monitoring wells will be developed aggressively to remove fines from the formation and sand pack. Development will be performed using a submersible pump and surge and purge techniques until the water is reasonably free of turbidity and field readings (pH, conductivity, temperature, and dissolved oxygen) sufficiently stabilize. The wells will be developed until turbidity is significantly reduced based on visual observation. The volume of water removed, the well development time, and field instrument readings will be recorded in field logs. Following development, the wells will be allowed to equilibrate for at least 14 days prior to sampling.

Groundwater Sampling

At least seven days after the groundwater monitoring wells are installed and developed, groundwater samples will be collected from the monitoring wells with a variable speed submersible pump and with dedicated high-density polyethylene (HDPE) tubing via United States Environmental Protection Agency (USEPA) low-flow sampling methodology. The pump intake will be placed at the approximate midpoint of the wetted portion of the screened interval and the wells will be purged at a maximum flow rate of 500 milliliters per minute (ml/min). At the ground surface, the purge water will pass through a sealed flow through cell containing probes which will measure the water temperature, pH, specific conductivity, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen (DO).

One groundwater sample will be collected from each well after the water quality parameters have stabilized and turbidity is less than 10 Nephelometric Turbidity Units (NTUs). If less than 10 NTUs cannot be reasonably achieved, samples will be collected at less than 50 NTUs. Stabilization is defined by three successive readings that are within ± 0.1 for pH, ± 3% for conductivity, ± 10 mv for ORP, and ± 10% for turbidity and DO. An example well purge log is provided in Appendix E. The groundwater samples will be analyzed for the following parameters:

- TCL VOCs by U.S. EPA method 8260C,
- TCL SVOCs by EPA method 8270D,
- PCBs by EPA method 8082A,
- TCL List metals (filtered and unfiltered) by EPA methods 6010D, 6020B, 7470A,
- Hexavalent/Trivalent Chromium by EPA method 7196A,
- Total Cyanide by Standard Method (SM) 4500, and

- NYSDEC List PFAS by EPA method 1633, and 1, 4-dioxane by EPA method 8270D.

All samples will be labeled, sealed, and placed in a cooler for shipment under standard chain-of-custody protocol to a NYSDOH Environmental Laboratory Approval Program (ELAP)-laboratory. One trip blank sample will accompany the groundwater samples (at a frequency of one per day of sampling with a sample submitted to the laboratory for analysis of Part 375 List and TCL VOCs.

4.4 SOIL VAPOR AND INDOOR/OUTDOOR AIR SAMPLING

As shown on Figure 5, Liberty proposes installing two sub-slab soil Vapor Pins™ (designated as SV-1 and SV-2) in the existing floor slab of the building at 276 Starr Street. Liberty will collect sub-slab soil vapor samples from the Vapor Pins™ using methods consistent with the NYSDOH VI Guidance, as amended. A sampling train containing stainless steel ball valves, air-tight fittings, Teflon tubing, a flow controller and an evacuated Summa canister will be attached to each vapor point and a shut-in leak test will be performed on the sampling train. Prior to sampling, purging of at least two volumes of air from the vapor point and sampling train will be performed with a personal sampling pump at a rate of 150 ml/minute. Liberty proposes to collect the sub-slab soil vapor samples in 6-liter Summa® canisters equipped with 150 ml/minute flow regulators, and leak tests will be performed using helium tracer gas to verify the integrity of the floor seals and tubing connections of the Vapor Pins™. Following collection, the Vapor Pins™ will be removed the floor slabs will be restored with cement. An example soil vapor sampling log is included in Appendix E.

Liberty will also collect two co-located indoor air samples (designated as IA-1 and IA-2) at the same locations as the sub-slab soil vapor samples, as shown on Figure 5. One outdoor ambient air sample will also be collected (designated as AA-1). Liberty will collect indoor and ambient outdoor samples in 6-liter Summa® canisters equipped with 8-hour flow regulators using methods consistent with the NYSDOH VI Guidance, as amended.

The air samples will be submitted to a NYSDOH ELAP-accredited laboratory and analyzed for the TCL VOCs via EPA Method TO-15.

4.5 GREEN AND SUSTAINABLE REMEDIATION (GSR) PRACTICES

According to NYSDEC DER-31 Green Remediation guidance document, green remediation approaches should be considered during site remediation. Liberty and its subcontractors will incorporate sustainability practices to reduce the environmental footprint of the investigation and cleanup. In accordance with ASTM E2893-16e1 the project GSR goals include the following:

- To minimize total energy use and maximize use of renewable energy,
- To minimize air pollutants and greenhouse gas emissions,
- To minimize water use and impact to water resources,
- To reduce, reuse and recycle materials and waste; and
- To protect land and ecosystems

Liberty will incorporate best management practices to lower our environmental footprint during the investigation and remediation phase of the project. Liberty will incorporate the following practicable measures during the planned scope of work:

1. Limit the use of generators, excavation equipment, and vehicles to reduce emissions.
2. Minimize truck travel for disposal of waste generated by selecting local disposal facilities, where possible.
3. Manage onsite resources and materials efficiently.
4. Use local subcontractors to minimize vehicle emissions during commute.
5. Request IRM implementation subcontractors to use clean diesel equipment to reduce emissions.
6. Request project staff and subcontractors to use public transportation during RI implementation to the extent practicable.
7. Reducing waste, increasing recycling, and increasing reuse of materials that would otherwise be considered waste.

As required, a Climate Screen Checklist and an environmental footprint analysis have been completed for the project and are attached in Appendix F.

4.6 QUALITY ASSURANCE / QUALITY CONTROL

As part of the field investigation, Liberty will also collect Quality Assurance/Quality Control (QA/QC) samples in accordance with the QAPP, presented in Appendix A, to confirm the usability of the data. QA/QC samples include equipment rinsate/field blanks, trip blanks, sample duplicates and matrix spike/matrix spike duplicates (MS/MSDs).

When applicable, the sample result summary tables will list the laboratory method detection limit (MDL) at which a compound was non-detectable. The laboratory results will be reported to the sample-specific practical quantitation limit (PQL), equal to the sample-specific MDL, supported by laboratory instrument calibrations. The reliability of laboratory data is supported by compliance with sample holding times and laboratory MDLs below cleanup criteria. Accuracy and precision of the laboratory analytical methods will be maintained using calibration and calibration verification procedures, laboratory control samples, and surrogate, matrix, and analytical spikes.

4.7 DATA MANAGEMENT AND VALIDATION

Liberty will coordinate with the laboratory to prepare the laboratory analytical reports in accordance with NYSDEC ASP Category B data deliverables, which include:

- Sample Delivery Group Narrative;
- Contract Lab Sample Information Sheets;
- NYSDEC Data Package Summary Forms;

- Chain-of-custody forms; and,
- Test analyses results.

Plus, related QA/QC information and documentation consisting of:

- Calibration standards;
- Surrogate recoveries;
- Blank results;
- Spike recoveries`
- Duplicate results;
- Confirmation (lab check/QC) samples;
- Internal standard area and retention time summary;
- Chromatograms;
- Raw data files; and
- Other specific information as described in the most current NYSDEC ASP

Liberty will coordinate with the laboratory to prepare the results in Electronic Data Deliverables (EDDs) format compatible with EQuIS that can be uploaded into an EQuIS database for storage and development of tables or output to other data analysis tools or GIS as needed. Liberty will have a third-party data validator evaluate the data package for inclusion into a DUSR that will subsequently be prepared to document the usability of the data. Additional details regarding QA/QC and data management and validation are included in Appendix A.

4.8 CHAIN OF CUSTODY AND SHIPPING

A chain-of-custody form will trace the path of sample containers from the Site to the laboratory. The project manager will notify the laboratory of upcoming field sampling events and the subsequent transfer of samples. This notification will include information concerning the number and type of samples, and the anticipated date of arrival. Insulated sample shipping containers (typically coolers) will be provided by the laboratory for shipping samples. All sample bottles within each shipping container will be individually labeled with an adhesive identification label provided by the laboratory. Project personnel receiving the sample containers from the laboratory will check each cooler for the condition and integrity of the bottles prior to field work.

The field sampler will indicate the sample designation/location number in the space provided on the chain-of-custody form for each sample. The chain of custody forms will be signed and placed in a sealed plastic Ziploc bag in the cooler. If sent via third party carrier, the shipping container will be closed for transport with nylon strapping, or a similar shipping tape, and paper custody seals will be affixed to the lid. The seals must be broken to open the cooler and will indicate tampering if the seals are broken before receipt at the laboratory. A label may be affixed identifying the cooler as containing "Environmental Samples" and the cooler will be shipped via courier or by an overnight

delivery service to the laboratory. When the laboratory receives the coolers, the custody seals will be checked, and lab personnel will sign the chain-of-custody form.

The following typical Chain-Of-Custody procedures will be implemented by Liberty during the remedial investigation sampling:

A. The samples are under custody of the Liberty field personnel, if:
   1. they are in his/her possession,
   2. they are in view after being in possession,
   3. they are locked up or sealed securely to prevent tampering, or
   4. they are in a designated secure area.

B. The original of the chain-of-custody form must accompany the samples at all times after collection, until receipt at the analytical laboratory. A copy of the chain-of-custody form will be kept by the sample collector until it is filed in the project file.

C. When the possession of samples is transferred, the individuals relinquishing and receiving the samples will sign, date, and note the time on the Chain-Of-Custody form.

D. When samples are shipped, the Liberty personnel, or designated representative, will note the courier's name, and air bill number, if applicable, on the Chain-Of-Custody form. Prior to shipping, coolers will be secured with signed custody seals so the laboratory may confirm coolers were not opened during shipping.

The chain-of-custody form will contain information to distinguish each sample from any other sample. This information will include:

1. The project name and address for which sampling is being conducted;
2. The name(s) and signature(s) of sampler(s);
3. The matrix being sampled (groundwater, soil, etc.);
4. The sampling date and time;
5. The specific sampling location in sufficient detail to allow re-sampling at the same location;
6. The number of containers and the volume of sample collected, and
7. The analytical method to be performed.

4.9 STORAGE AND DISPOSAL OF INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) generated during the RI will be containerized and properly characterized and disposed. Containers, which are USDOT approved storage containers (55-gallon drums) or a small bulk roll-off container, will be properly labeled and grouped by environmental matrix (soil, water, PPE/plastic, etc.). All drums or roll-offs will be staged in a central location on-Site prior to off-Site disposal.

If drums are used, they will be tracked as they are filled and given unique identification codes based on the following:

- A prefix indicating the drum's contents: i.e., S – Soil, W – Water, P – PPE/Plastic, and C&D – Construction Debris.

- Following the prefix and a hyphen will be the origin of the drum's contents. For example, drum S-SB-1, SB-2, SB-3 is a generated drum filled with soil from soil boring locations SB-1, SB-2, and SB-3; drum W-MW-1 is water generated from monitoring well MW-1.

- As drums are generated, their identification code, date of generation, contents, source (i.e., drill cuttings from location x, purge water from well y), and date sampled will be entered on a tracking table.

- For example, the full nomenclature of S-2/SB-2 110724 would be the second drum produced during the program with its contents from Soil Boring No. 2 generated on November 7, 2024.

The drums will be centrally stored on-Site. Subsequently, the waste soils and/or water will be characterized with laboratory analyses for proper disposal.

5 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

A Qualitative Human Health Exposure Assessment (QHHEA) will be performed following the collection of all RI data. The Exposure Assessment (EA) will be performed in accordance with Section 3.3(c)4 of DER-10 and the NYSDOH guidance for performing a qualitative EA (DER-10; Appendix 3B). The QHHEA will characterize the exposure setting, identify potentially complete exposure pathways, and qualitatively evaluate potential fate and transport of constituents from one medium to another (i.e., soil-to-air or soil-to-groundwater).

An exposure pathway is considered complete when the following five conditions are met:

1. Source identified (i.e., metals in paint on exterior building surfaces);
2. Release and transport mechanisms from source to environmental media (i.e., into the subsurface or volatilization to the air of an overlying building);
3. Point of human exposure (i.e., an occupied building or surface soil);
4. A route of exposure (ingestion, dermal contact, or inhalation), and
5. A receptor population (i.e., on-Site workers).

Once potentially complete exposure pathways are identified, the QHHEA will characterize Site conditions to determine whether the Site poses an existing or potential future hazard to the potentially exposed population. The evaluation will include a qualitative discussion of potential fate and transport mechanisms at the Site. The results of the QHHEA will be included as part of the Remedial Investigation Report (RIR).

According to Section 3.10 of DER-10, and the Fish and Wildlife Resources Impact Analysis Decision Key in DER-10 Appendix 3C, a Fish and Wildlife exposure assessment will be performed (if needed) based on the results of the RI.

6 HEALTH AND SAFETY

The work outlined above will be completed under a Site-specific Health and Safety Plan (HASP), attached as Appendix B in accordance with OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. A PID will be used to monitor the breathing zone of workers performing investigative activities in areas where there is potential for the presence of organic vapors (i.e., soil boring/sampling, well drilling/construction, groundwater and soil vapor sampling). Liberty anticipates the work will be completed in Modified Level D personal protective equipment (PPE); however, workers will be prepared to elevate to more protective PPE based on the conditions encountered during field activities.

6.1 PROJECT KICK-OFF AND UTILITY CLEARANCE

A project kick-off meeting will be held prior to initiating field work to orient field team members and subcontractors with the Site background, scope of work, potential hazards, health and safety requirements, emergency contingencies and other field procedures.

Prior to performing any subsurface work, a utility clearance survey will be performed in accordance with New York State Dig-Safe protocol. Sample locations will be screened using surface geophysical techniques such as electromagnetic (EM), ground penetrating radar (GPR) and/or radiofrequency (RF) techniques.

6.2 COMMUNITY AIR MONITORING PLAN

Periodic air monitoring for VOCs and particulate levels at the perimeter of the exclusion zone or work area will be performed in accordance with the CAMP (see Appendix C).

Periodic monitoring will be required for all ground intrusive activities and non-intrusive activities. Ground intrusive activities include, but are not limited to, sawing and removal of floor slabs, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells. Non-intrusive activities include, but are not limited to, the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic VOC monitoring during non-intrusive sample collection activities will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. Particulate monitoring will not be required for non-intrusive site investigation or remedial activities.

VOC and particulate monitoring to be performed as part of the CAMP is briefly summarized below. Because the majority of the intrusive remedial investigation activities proposed for the Site

will be performed inside the Site building or in the sidewalk between Starr Street and the Site building, the CAMP presented in Appendix C includes special monitoring requirements, response levels and actions for work in these areas.

VOC Monitoring

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a periodic basis with a frequency of at least one measurement per hour. Upwind concentrations will be measured at the start of each workday and thereafter at the same frequency as downwind measurements to establish and document background conditions. Given the short duration of both the intrusive and non-intrusive activities, the VOC monitoring will be limited to instantaneous readings, to be performed using a handheld MiniRAE 3000 photoionization detector (PID) equipped with an 11.7 ev lamp. The PID will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate (isobutylene). The PID concentrations will be compared to action levels specified in the CAMP. All PID readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

Particulate Monitoring

Particulate concentrations will be monitored periodically at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. Upwind and downwind particulate concentrations will be measured at the start of each workday and at a frequency of at least one measurement per hour thereafter. The particulate monitoring will be performed using a handheld TSI Aurotrack 9306V which is capable of measuring particulate matter less than 10 micrometers in size (PM-10). The particulate monitoring unit is equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. Visible dust from the work area will trigger the initiation of dust suppression procedures. Dust suppression equipment will be on Site, functional and available at the work zone prior to commencing work. Particulate monitoring readings will be recorded and be available for State (NYSDEC and NYSDOH) and County Health personnel to review.

7 REPORTING

During the duration of the Remedial Investigation activities, daily and monthly field reports will be completed and submitted to the NYSDEC. Upon completion of the field activities, a RIR will be prepared to document the findings of the investigations performed at the Site and the proposed remedy. The RIR will be consistent with the specifications presented in the DER-10 document and will include:

- An executive summary;
- A Site description and history;
- Summary information regarding previous investigations and remedial work performed at the Site;
- Descriptions of field activities performed;
- A summary of pertinent field observations, field measurements, and laboratory analytical data summarized in tabular format - analytical results will be compared to appropriate NYSDEC guidance and standards;
- Spider diagrams for analytical results showing exceedances and comparisons to applicable standards;
- Plan view and cross-section figures presenting laboratory analytical data and field observations of surface and subsurface soil and groundwater impacts. A minimum of two profiles will be developed, one perpendicular to and one parallel with groundwater flow direction at the Site;
- A qualitative human health exposure assessment which assesses the sources of impact and exposure pathways to on and off-Site human receptors;
- A data usability review and DUSRs for the laboratory data collected during the RI;
- An integration of field observations and measurements with laboratory analytical data to evaluate the nature and extent of impacts and to develop a site conceptual model of potential contaminant migration;
- A set of conclusions for the investigation; and
- Recommendations

Data collected during the RI will be submitted in the Department's Environmental Information Management System (EIMS) format for Electronic Data Delivery (EDD).

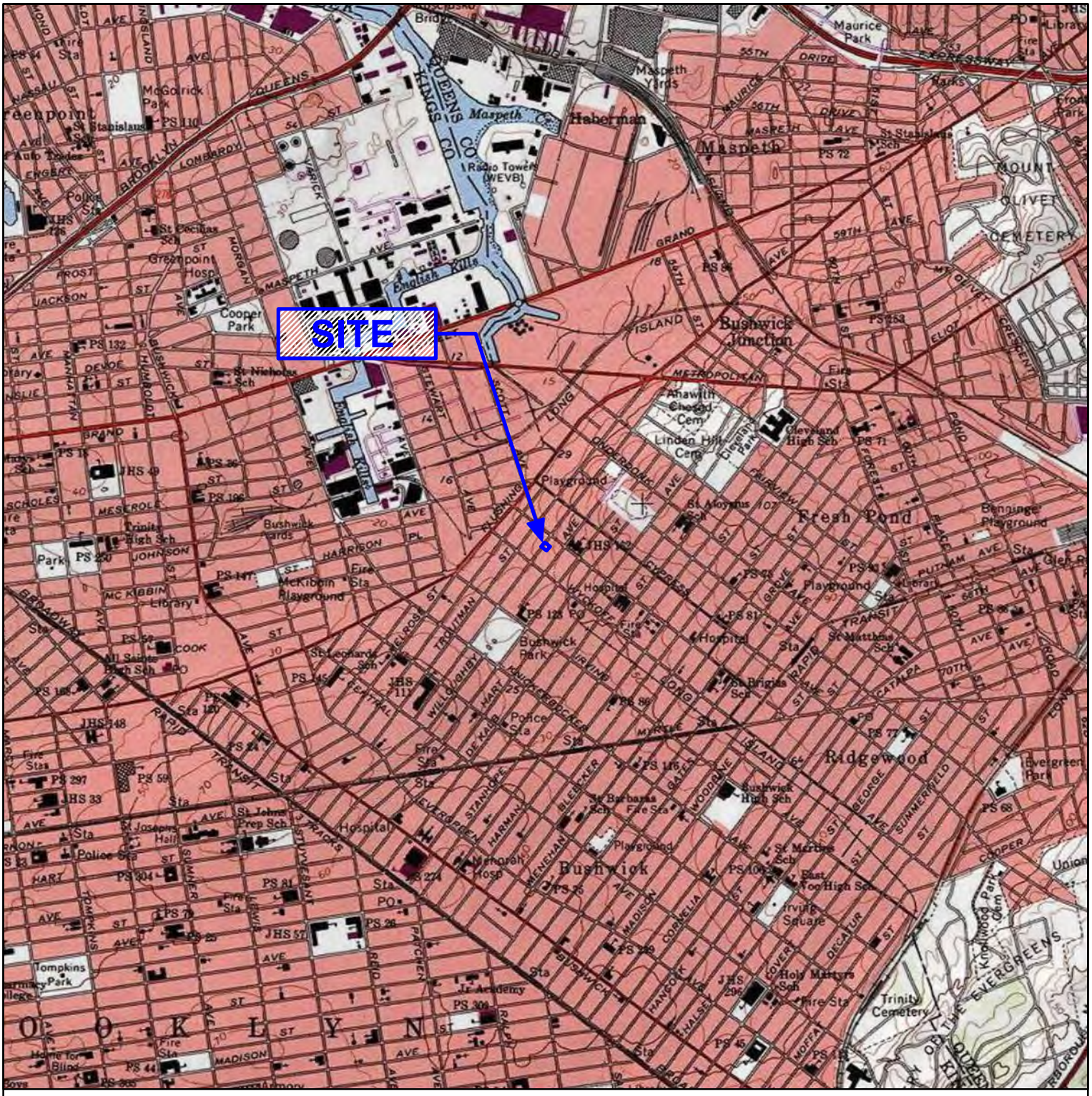
8 PROJECT SCHEDULE AND PROJECT PERSONNEL

Our anticipated schedule to perform the investigation activities described in the Gantt chart on Table 3. We note that the proposed schedule may be adjusted if unforeseen delays occur due to inclement weather, Department of Transportation (DOT) permit approval, drill rig availability or other conditions that are beyond Liberty's control.

The following Liberty project personnel are proposed to be involved as part of the remedial investigation activities. Qualifications of personnel are provided in Appendix G. Drilling and laboratory subcontractors have not yet been retained.

Personnel	Role	Contact Information
James P. Cinelli, P.E.,	Project Management/Oversight	800-305-6019
David S. Coyne, QEP	Project Quality Assurance Officer	800-305-6019
Jack Yekel	Field Geologist	717-517-5000

FIGURES



SOURCE: USA TOPO MAPS - COPYRIGHT © 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED.
BROOKLYN (1997), NEW YORK 7.5-MINUTE QUADRANGLE.

SCALE: 1 " = 2,000 '

0 1,000 2,000 4,000'

N

Liberty Environmental, Inc.
505 Penn St. Suite 400
Reading, PA 19601
Phone: 610-375-9301
www.libertyenviro.com

Figure 1 - Site Location Map

Churches United For Fair Housing
276-284 Starr Street
Brooklyn, New York (Block 3200, Lot 19)

PROJECT NO.: 220872.04	REV: 0	PREPARED BY: JRY
DATE: JUNE 4, 2025	SCALE: 1" = 2,000'	APPROVED BY: JPC

NOTE: THIS DRAWING INTENDED FOR ILLUSTRATIVE PURPOSES ONLY, AS PART OF A SITE CHARACTERIZATION.
NOT TO BE USED AS A BASIS FOR ENGINEERING OR DESIGN
IMAGE SOURCE: ESRI [MICROSOFT] DIGITALGLOBE. PHOTO DATE: MARCH 16, 2022.

SCALE: 1 " = 60 '
0 30 60 120'

N

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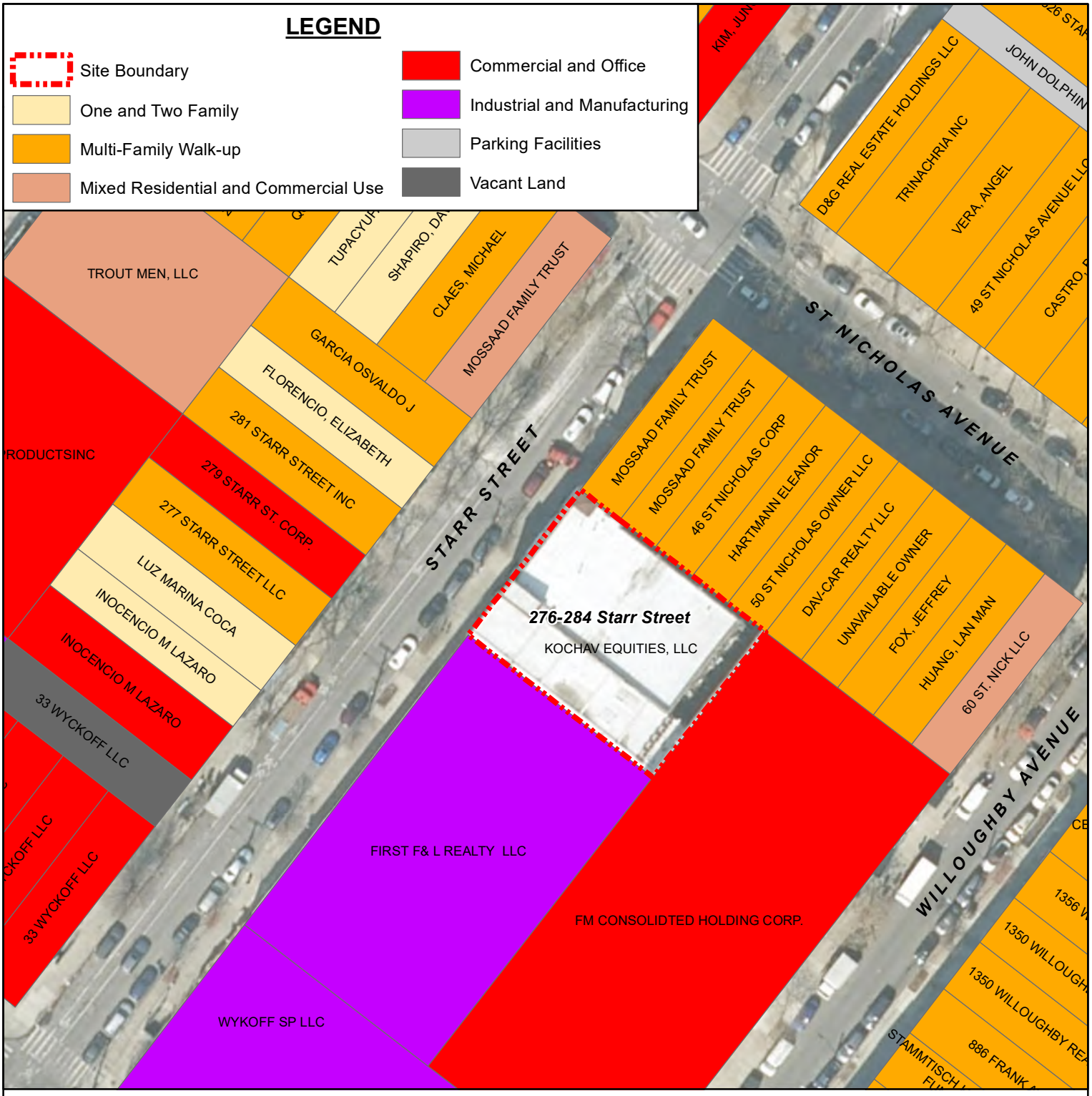
Figure 2 - Site Boundary Map

Churches United For Fair Housing
276-284 Starr Street
Brooklyn, New York (Block 3200, Lot 19)

PROJECT NO.: 220872.04	REV: 0	PREPARED BY: JRY
DATE: JUNE 4, 2025	SCALE: 1" = 60'	APPROVED BY: JPC



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SCALE: 1 " = 60 '
0 30 60 120'

N

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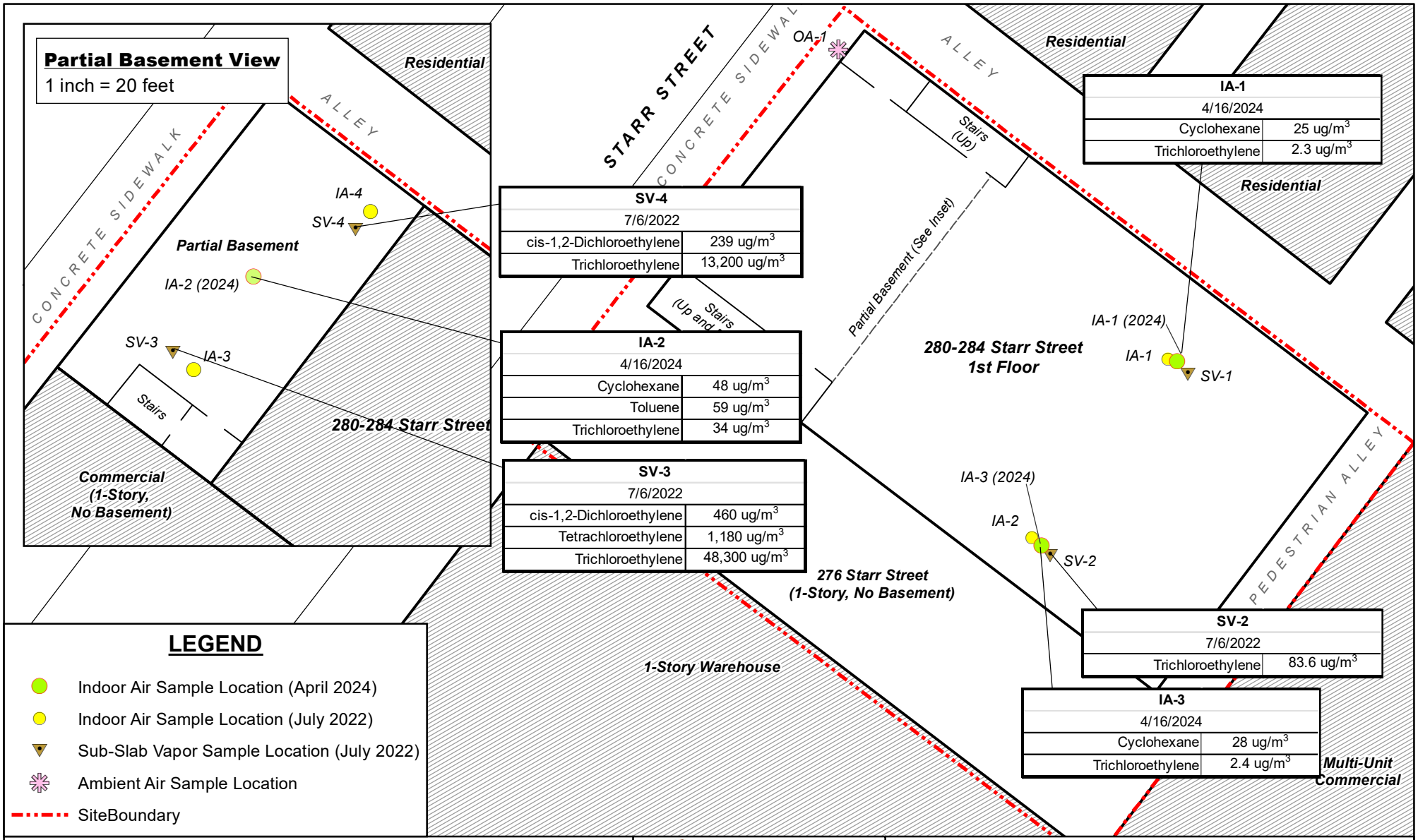
Figure 3 - Surrounding Land Use

Churches United For Fair Housing
276-284 Starr Street
Brooklyn, New York (Block 3200, Lot 19)

PROJECT NO.: 220872.04	REV: 0	PREPARED BY: JRY
DATE: JUNE 4, 2025	SCALE: 1" = 60'	APPROVED BY: JPC



NOTE: THIS DRAWING INTENDED FOR ILLUSTRATIVE PURPOSES ONLY, AS PART OF A SITE CHARACTERIZATION.
NOT TO BE USED AS A BASIS FOR ENGINEERING OR DESIGN
NOTE: BUILDING FEATURES ARE APPROXIMATE AND BASED ON BBG PHASE II SITE SKETCHES.

Figure 4 - Prior Soil Vapor and Indoor Air Sample Locations

Churches United For Fair Housing
276-284 Starr Street
Brooklyn, New York (Block 3200, Lot 19)

Liberty Environmental, Inc.
505 Penn St. Suite 400
Reading, PA 19601
Phone: 610-375-9301
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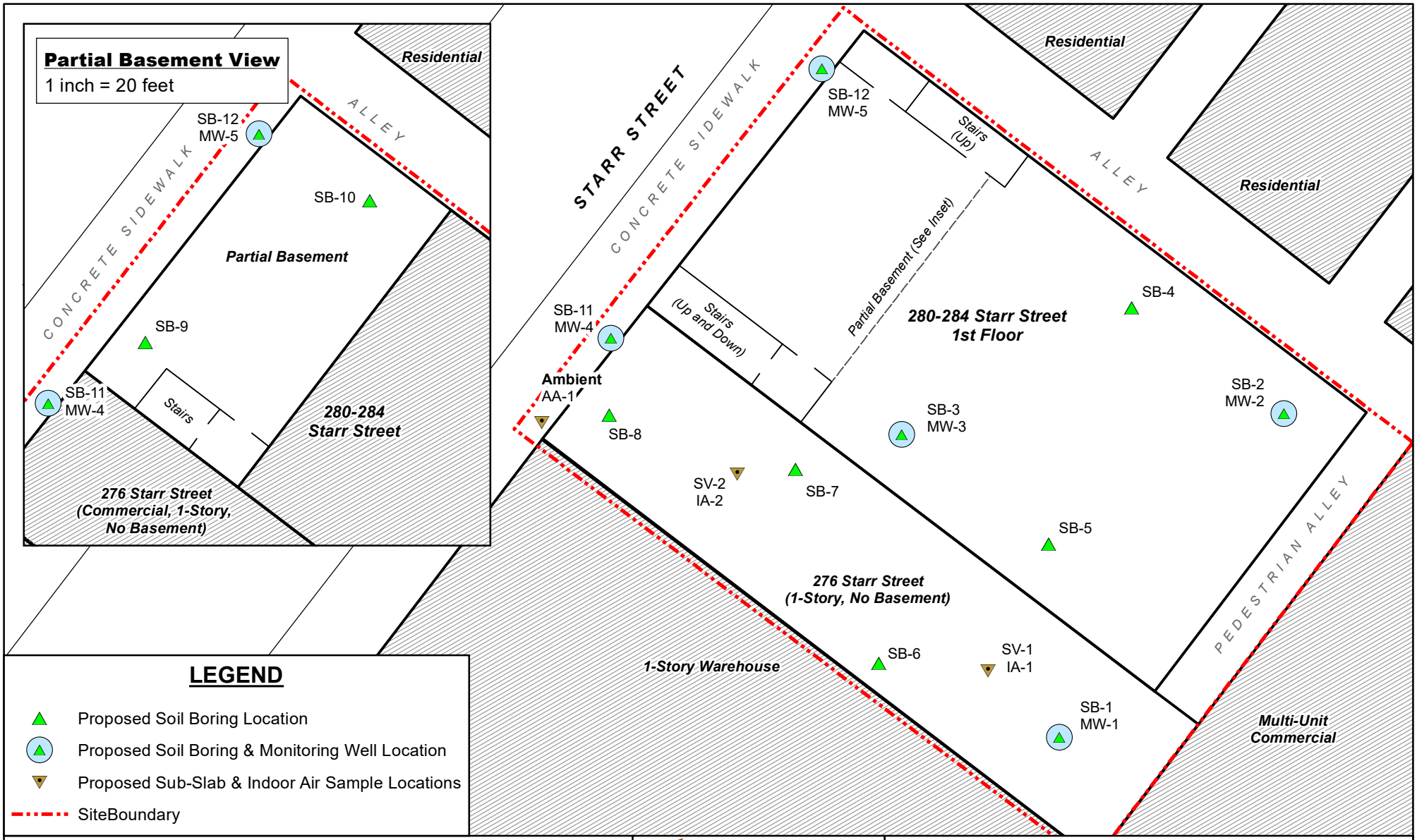
PROJECT NO.: 220872.02	REV: 0	PREPARED BY: JRY
DATE: JUNE 4, 2025	SCALE: 1" = 20'	APPROVED BY: JPC



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NOT TO BE USED AS A BASIS FOR ENGINEERING OR DESIGN
NOTE: BUILDING FEATURES ARE APPROXIMATE AND BASED ON BBG PHASE II SITE SKETCHES.

N

SCALE: 1 " = 20 '

0 10 20 40'

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Figure 5 - Proposed Soil Borings, Monitoring Wells & Vapor Intrusion Sampling Locations

Churches United For Fair Housing
276-284 Starr Street
Brooklyn, New York (Block 3200, Lot 19)

PROJECT NO.: 220872.04	REV: 0	PREPARED BY: JRY
DATE: JUNE 4, 2025	SCALE: 1" = 20'	APPROVED BY: JPC

TABLES

Table 1: Summary of Sub-Slab Vapor and Indoor Air Sampling Analytical Results

276-284 Starr Street, Brooklyn, NY
Liberty Project 220872.03
May 2, 2025

	NYSDOH Decision Matrices Sub-Slab Soil Gas TEST INDOOR AIR [1]	*NYSDOH Decision Matrices Sub-Slab Soil Gas MITIGATE [2]*	*NYSDOH Decision Matrices Indoor Air NO FURTHER ACTION [3]*	*NYSDOH Decision Matrices Indoor Air ID SOURCE or RE-SAMPLE or MITIGATE [4]*	*SV-1*	*SV-2*	*SV-3*	*SV-4*	*IA1*	*IA2*	*IA3*	*IA4*	*OA1*	*IA-1*	*IA-2*	*IA-3*
	Sample Matrix				*Sub-Slab Soil Gas*				*Indoor Air*							
	Sample Date				*7/6/2022*	*7/6/2022*	*7/6/2022*	*7/6/2022*	*7/6/2022*	*7/6/22*	*7/6/22*	*7/6/22*	*7/6/22*	*4/16/24*	*4/16/24*	*4/16/24*
Volatile Organics Compounds (VOCs) [5]	*Compound Concentrations and NYSDOH Decision Matix Concentrations in µg/m3*															
1,1,1-Trichloroethane	***100 to <1,000***	***1,000 and above***	***3 to <10***	***10 and above***	39.7	47.9	19.5	7.02	ND	1.76	3.09	2.94	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	***~***	***~***		***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.81	0.95	0.86
1,3,5-Trimethylbenzene	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
1,4-Dioxane	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
2,2,4-Trimethylpentane	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
2-Butanone	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1	5	1.5
2-Hexanone	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	2.1	ND
4-Methyl-2-pentanone	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
Acetone	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	26	60	55
Acrylonitrile	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.41	0.21	ND
Benzene	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	14	1.2	5.69	3.77	ND	1.29	1.1	1.15	0.76	0.7	0.62	0.7
Carbon disulfide	***~***	***~***		***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
Carbon tetrachloride	***6 to <60***	***60 and above***	***0.2 to <1.0***	***1 and above***	ND	1.29	4.59	1.97	ND	ND	ND	ND	ND	0.44	0.5	0.49
Chloroform	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.42	4.2	0.47
Chloromethane	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4	1.2	1.2
1,1-Dichloroethylene	***6 to <60***	***60 and above***	***0.2 to <1.0***	***1 and above***	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	***6 to <60***	***60 and above***	***0.2 to <1.0***	***1 and above***	ND	ND	460	239	ND	ND	ND	ND	ND	ND	0.42	ND
Cyclohexane	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	25	48	28
Dichlorodifluoromethane	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6	3.2	2.6
Ethanol			***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl acetate	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1	1.3	2.1
Ethyl Benzene	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.99	1.4	0.76
Hexachlorobutadiene	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
Isopropanol	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	4.5	7.4
Methylene chloride	***100 to <1,000***	***1,000 and above***	***3 to <10***	***10 and above***	1.09	1.19	ND	1.49	5	2.09	2.77	3.37	1.9	0.76	0.76	0.79
Naphthalene	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
n-Heptane	***200 to <2,000***	***2,000 and above***	***6 to <20***	***20 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4	4.2	2.5
n-Hexane	***200 to <2,000***	***2,000 and above***	***6 to <20***	***20 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.5	2.3	1.7
o-Xylene	***60 to <600***	***600 and above***	***2 to <10***	***10 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6	1.7	0.99
p- & m- Xylenes	***200 to <2,000***	***2,000 and above***	***6 to <20***	***20 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.8	5.2	3
p-Ethyltoluene	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.66	0.65	0.69
Propylene	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1	4.2	2
Styrene	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.33	0.52	ND
Tetrachloroethylene	***100 to <1,000***	***1,000 and above***	***3 to <10***	***10 and above***	22.9	19.8	1180	400	ND	1.72	3.01	3.16	ND	0.53	1.7	ND
Tetrahydrofuran	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
Toluene	***300 to <3,000***	***3,000 and above***	***10 to 50***	***50 and above***	NA	NA	NA	NA	NA	NA	NA	NA	NA	32	59	35
trans-1,2-Dichloroethylene	***~***	***~***		***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropylene	***~***	***~***		***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethylene	***6 to <60***	***60 and above***	***0.2 to <1.0***	***1 and above***	ND	83.6	48,300	13,200	ND	7.88	81.4	76.6	ND	2.3	34	2.4
Trichlorofluoromethane (Freon 11)	***~***	***~***	***~***	***~***	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4	1.5	1.5
Vinyl Chloride	***6 to < 60***	***60 and above***	***< 0.2***	***0.2 and above***	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
1. Values represent the second row sub-slab vapor concentrations from New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air Decision Matrices A-F.
2. Values represent the third row sub-slab vapor concentrations from NYSDOH Soil Vapor/Indoor Air Decision Matrices A-F.
3. Values represent the 2nd column indoor air concentrations from NYSDOH Soil Vapor/Indoor Air Decision Matrices A-F.
4. Values represent the third column indoor air concentrations from NYSDOH Soil Vapor/Indoor Air Decision Matrices A-F.
5. Compounds listed represent VOCs which were detected in sub-slab soil gas or indoor/ambient air at concentrations above laboratory reporting limits.
Values preceeded by "<" are less than the laboratory reporting limit .
A '~' symbol indicates that no guidance value applies for the compound.
Values in bold were detected above the laboratory reporting limit.
Values in bold and yellow shading fall within the second row sub-slab vapor concentration ranges provided in NYSDOH Soil Vapor/Indoor Air Decision Matrices A-F.
Values in bold and orange shading fall within the third row sub-slab vapor concentration ranges provided in NYSDOH Soil Vapor/Indoor Air Decision Matrices A-F.
NA = compound not analyzed.

Table 2: Sample Summary and Rationale

Remedial Investigation Work Plan

276-284 Starr Street, Brooklyn, NY

Liberty Project 220872.04

Sample Name	Location	Sample / Boring Termination Depth (feet below ground surface)	Approximate Number of Samples	Rationale For Sampling	Laboratory Analysis
SB-1	276 Starr Street; 86 Feet southeast of northwest corner of the building; 11 feet from southwest wall	12	2	To characterize soil conditions and identify soil contamination underneath the building structure.	c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-2	280-284 Starr Street; 82 feet southeast of the northeast building corner; 8 feet from northeast wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-3	280-284 Starr Street; 42 feet southeast of the northwest building corner; 7 feet from southeast wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-4	280-284 Starr Street; 56 feet southeast of the northeast building corner; 8 feet from northeast wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-5	280-284 Starr Street; 68 feet southeast of the northwest building corner; 8 feet from southeast wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-6	276 Starr Street; 60 Feet southeast of northwest corner of the building; 4 feet from southwest wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-7	276 Starr Street; 33 Feet southeast of northwest corner of the building; 18 feet from southwest wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-8	276 Starr Street; 6 Feet southeast of northwest corner of the building; 8 feet from southwest wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-9	280-284 Starr Street Partial Basement; 4 feet southeast of the northwest building corner; 8 feet from southeast wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-10	280-284 Starr Street; 18 feet southeast of the northeast building corner; 6 feet from northeast wall	12	2		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
SB-11	Sidewalk in front of 276 Starr Street; 6 Feet southwest of northwest corner of the building; 3 feet from building	12	0		No Samples
SB-12	Sidewalk in front of 80 - 284 Starr Street; 8 Feet southwest of northeast corner of the building; 3 feet from building	12	0		No Samples

Table 2: Sample Summary and Rationale

Remedial Investigation Work Plan

276-284 Starr Street, Brooklyn, NY

Liberty Project 220872.04

Sample Name	Location	Sample / Boring Termination Depth (feet below ground surface)	Approximate Number of Samples	Rationale For Sampling	Laboratory Analysis
MW-1	276 Starr Street; 79 Feet southeast of northwest corner of the building; 11 feet from southwest wall	30	1	To characterize groundwater conditions underneath the building structure.	c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
MW-2	280-284 Starr Street; 82 feet southeast of the northeast building corner; 8 feet from northeast wall	30	1		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
MW-3	280-284 Starr Street; 42 feet southeast of the northwest building corner; 7 feet from southeast wall	30	1		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
MW-4	Sidewalk in front of 276 Starr Street; 6 Feet southwest of northwest corner of the building; 3 feet from building	30	1		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260
MW-5	Sidewalk in front of 80 - 284 Starr Street; 8 Feet southwest of northeast corner of the building; 3 feet from building	30	1		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via EPA Method 8260

Table 2: Sample Summary and Rationale

Remedial Investigation Work Plan

276-284 Starr Street, Brooklyn, NY

Liberty Project 220872.04

Sample Name	Location	Sample / Boring Termination Depth (feet below ground surface)	Approximate Number of Samples	Rationale For Sampling	Laboratory Analysis
Sub-Slab Soil Vapor					
SV-1	276 Starr Street; 79 Feet southeast of northwest corner of the building; 12 feet from southwest wall	2-inches below floor slab	1	To characterize CVOC and VOC concentrations underneath the floor slabs of the building structure.	c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via TO-15
SV-2	276 Starr Street; 45 Feet southeast of northwest corner of the building; 14 feet from southwest wall	2-inches below floor slab	1		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via TO-15
Sample Name	**Location**	**Sample Height (feet above ground surface)**	**Approximate Number of Samples**	**Rationale For Sampling**	**Laboratory Analysis**
Indoor Air					
IA-1	See SV-1	4	1	To characterize CVOC and VOC concentrations in indoor air at the co-locations of the sub-slab vapor samples and outdoor ambient air.	c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via TO-15
IA-2	See SV-2	4	1		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via TO-15
AA-1	280-284 Starr Street; outside northwest building wall	4	1		c12-DCE, 11-DCE, carbon tetrachloride, methylene chloride, 111-TCA, TCE, PCE, vinyl chloride, benzene, toluene, ethylbenzene, xylenes and cyclohexane via TO-15

Table 3: BROWNFIELD CLEANUP PROGRAM PROJECT SCHEDULE

276-284 Starr Street, Brooklyn, New York

Project Milestones	Start	End	2025							2026											
			Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BCP Application and RIWP & IRMWP Submission to NYSDEC		6/6/2025	■	■																	
NYSDEC BCP Application Review and Determination of Completeness	6/6/2025	8/6/2025		■	■																
Revisions to BCP Application, RIWP and IRMWP	8/6/2025	9/6/2025			■	■															
CPP Submission and Review	8/6/2025	9/6/2025			■	■															
30-Day Public Comment for BCP Application	8/6/2025	9/6/2025			■	■															
NYSDEC and NYSDOH Review of RIWP & IRMWP and Submission of Revisions	9/6/2025	10/6/2025				■	■														
BCA Execution	9/15/2025	10/6/2025					■														
RIWP Implementation	10/15/2025	11/15/2025					■	■													
RIR Preparation	11/15/2025	1/15/2026						■	■	■											
NYSDEC and NYSDOH Review of RIR and IRMWP, Submission of Revisions and 45-Day Comment Period	1/16/2026	3/31/2026								■	■	■									
Approval of the RIR and IRMWP, Issuance of Decision Document	4/15/2026	5/15/2026											■	■							

* The chart above presents a schedule for the proposed BCP Project Implementation and Reporting. If the schedule for the activities changes, it will be updated and submitted to NYSDEC.

APPENDIX A:

Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP)

Quality Assurance Project Plan (QAPP) / Field Sampling Plan (FSP)

For

Churches United For Fair Housing (CUFFH) Offices

276-284 Starr Street, Borough of Brooklyn

Block 3200, Lot 19

NYSDEC Site No. 224430

Prepared for:

Churches United For Fair Housing
7 Marcus Garvey Boulevard
Brooklyn, NY 11206
rsolano@cuffh.org

Prepared by:

Liberty Environmental
600 Third Avenue, Second Floor
New York, NY 10016
jcinelli@libertyenviro.com
800.305.6019

June 9, 2025

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1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) presents the organization, objectives, planned activities, and specific quality assurance/quality control (QA/QC) procedures associated with the Remedial Investigation Work Plan (RIWP) at 276 – 284 Starr Street, Brooklyn, New York (Site). Figure 1 presents a Site location map.

This QAPP/FSP describes specific protocols for field sampling, sample handling and storage, chain-of-custody, laboratory analysis, and data handling and management. Preparation of the Plan was based on EPA Quality Assurance Project Plan guidance documents, including:

EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5, March 2001); and Guidance for Quality Assurance Project Plans (EPA QA/G-5, December 2002).

The data generated from the analysis of samples will be used to determine the extent of contamination, identify impacted targets, and to compare the results of the remedial actions to site-specific cleanup goals. Potential parameters to be analyzed, including their respective quantitation limits (QLs), and data quality levels (DQLs), are provided in Tables 1A through 1C.

2 PROJECT ORGANIZATION AND RESPONSIBILITY

A qualified person will coordinate and manage the Site sampling and analysis program, data reduction, QA/QC, data validation, analysis, and reporting. James P. Cinelli, PE, PG is a New York State-licensed Professional Engineer and Professional Geologist and will direct the sampling activities and coordinate laboratory and drilling activities. The intent of this QAPP/FSP is to be performed the RI in accordance with the technical guidance applicable to Technical Guidance for Site Investigation and Remediation (DER-10).

A qualified person will ensure that the QA/QC plan is implemented and will oversee Liberty's 3rd-party data validation contractor. David S. Coyne, is a qualified environmental professional (QEP), as defined by the New York State Department of Environmental Conservation (NYSDEC) and will act as the project QA Officer and provide oversight and technical support to ensure the sampling and analytical procedures outlined in this QAPP are followed. This individual is independent from the data generation activities and has the broad authority to approve or disapprove project plans, specific analyses, and final reports. In general, the QA officer will be responsible for reviewing and advising on all QA/QC aspects of this program.

Laboratories used will be New York State Department of Health Environmental (NYSDOH) Laboratory Approval Program (ELAP) certified laboratories. The laboratories will communicate directly with the sampler regarding the analytical results and reporting and will be responsible for providing all labels, sample containers, field blank water, trip blanks, shipping coolers, and laboratory documentation.

3 QA OBJECTIVES FOR DATA MANAGEMENT

The analytical data will be provided by the laboratory using the NYSDEC Category B deliverable format. Analytical data collected for disposal characteristics that may be requested by off-site soil or wastewater disposal facilities will be provided in the format that the facility requests.

All analytical measurements will be made so that the results are representative of the media sampled and the conditions measured. Data will be reported in consistent dry weight units for solid samples [i.e., micrograms per kilogram (µg/kg) and/or milligram per kilogram (mg/kg), micrograms per liter (µg/L) or milligrams per liter (mg/L) for aqueous samples and in micrograms per cubic meter (µg/m3) for soil vapor and air samples. Table 2 presents the proposed samples, sampling and analytical parameters, analytical methods, sample preservation requirements and containers.

Quantitation Limits (QLs) are laboratory-specific and reflect those values achievable by the laboratory performing the analyses. Data Quality Levels (DQLs) are those reporting limits required to meet the objectives of the program (i.e., program action levels, cleanup standards, etc.). Data Quality Objectives (DQOs) define the quality of data and documentation required to support decisions made in the various phases of data collection activities. DQOs are dependent on the end uses of the data to be collected and are also expressed in terms of objectives for precision, accuracy, representativeness, completeness, and comparability.

The analytical methods to be used at this Site provide the highest level of data quality and can be used for purposes of risk assessment, evaluation of remedial alternatives and verification that cleanup standards have been met. However, in order to ensure that the analytical methodologies are capable of achieving the DQOs, measurement performance criteria have been set for the analytical measurements in terms of accuracy, precision, and completeness.

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting which will provide results that are scientifically valid, and the levels of which are sufficient to meet DQOs. Specific procedures for sampling, chain of custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, and corrective action are described in other sections of this QAPP/FSP.

Tables 3, 4, and 5 present the precision and accuracy requirements for each parameter to be analyzed. For quantitation limits for parameters associated with soil, sediment, and solid waste samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits listed in 6 NYCRR Part 375.

For quantitation limits for parameters associated with groundwater samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits for groundwater from the Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Ambient Water Quality Standards and guidance Values. In certain instances, if the TOGS criteria are not achievable due to analytical limitations, the laboratory will report the lowest possible quantitation limit.

For quantitation limits for parameters associated with soil gas samples, the laboratory will be required to meet the parameter-specific limits from EPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), Table 3c-SG: Question 5 Soil Gas Screening Levels for Scenario-Specific Vapor Attenuation Factors, November 2002. In certain instances, if these criteria are not achievable due to analytical limitations, the laboratory will report the lowest possible quantitation limits (see Tables 1A through 1C for affected analytes).

The QA objectives are defined as follows:

Accuracy is the closeness of agreement between an observed value and an accepted reference value. The difference between the observed value and the reference value includes components of both systematic error (bias) and random error.

Accuracy in the field is assessed through the adherence to all field instrument calibration procedures, sample handling, preservation, and holding time requirements, and through the collection of equipment blanks prior to the collection of samples for each type of equipment being used (e.g., split spoons, groundwater sampling pumps).

The laboratory will assess the overall accuracy of their instruments and analytical methods (independent of sample or matrix effects) through the measurement of "standards," materials of accepted reference value. Accuracy will vary from analysis to analysis because of individual sample and matrix effects. In an individual analysis, accuracy will be measured in terms of blank results, the percent recovery (%R) of surrogate compounds in organic analyses, or %R of spiked compounds in matrix spikes (MSs), matrix spike duplicates (MSDs) and/or laboratory control samples (LCSs). This gives an indication of expected recovery for analytes tending to behave chemically like the spiked or surrogate compounds. Tables 3, 4, and 5 summarize the laboratory accuracy requirements.

Precision is the agreement among a set of replicate measurements without consideration of the "true" or accurate value: i.e., variability between measurements of the same material for the same analyte. Precision is measured in a variety of ways including statistically, such as calculating variance or standard deviation.

Precision in the field is assessed through the collection and measurement of field duplicates (one extra sample in addition to the original field sample). Field duplicates will be collected at a frequency of one per twenty investigative samples per matrix per analytical parameter. Precision will be measured through the calculation of relative percent differences (RPDs). The resulting information will be used to assess sampling and analytical variability. Field duplicate RPDs must be < 50 for soil samples and < 30 for aqueous samples. These criteria apply only if the sample and/or duplicate results are >5x the quantitation limit; if both results are < 5x the quantitation limit, the criterion will be doubled. Due to the uncertainty of available representative soil gas volume, field duplicates will not be collected for this matrix.

Precision in the laboratory is assessed through the calculation of RPD for duplicate samples. For organic soil, sediment and water analyses, laboratory precision will be assessed through the analysis of MS/MSD samples and field duplicates. For soil gas analyses, laboratory precision will be assessed through the analysis of matrix duplicates. MS/MSD samples or matrix duplicates will be performed at a frequency of one per twenty investigative samples per matrix per parameter. Tables 3, 4, and 5 summarize the laboratory precision requirements.

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. "Normal conditions" are defined as the conditions expected if the sampling plan was implemented as planned.

Field completeness is a measure of the amount of (1) valid measurements obtained from all the measurements taken in the project and (2) valid samples collected. The field completeness objective is greater than 90 percent.

Laboratory completeness is a measure of the amount of valid measurements obtained from all valid samples submitted to the laboratory. The laboratory completeness objective is greater than 95 percent.

Representativeness is a qualitative parameter that expresses the degree to which data accurately and precisely represent either a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. To ensure representativeness, the sampling locations have been selected to provide coverage over a wide area and to highlight potential trends in the data. In addition, field duplicate samples will provide an additional measure of representativeness at a given location.

Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plans and QAPP are followed, and that proper sampling, sample handling, and sample preservation techniques are used.

Representativeness in the laboratory is ensured by using proper analytical procedures, appropriate methods, and meeting sample holding times.

Comparability expresses the confidence with which one data set can be compared to another. Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plans and QAPP are followed and that proper sampling techniques are used. Maximization of comparability with previous data sets is expected because the sampling design and field protocols are consistent with those previously used.

Comparability is dependent on the use of recognized EPA or equivalent analytical methods and the reporting of data in standardized units. Laboratory procedures are consistent with those used for previous sampling efforts.

4 SAMPLING PLAN

Environmental sampling may include soil, groundwater, soil vapor and indoor ambient air sampling. Additionally, wastes generated during remediation or development will be sampled and tested for characterization for disposal. Direct push drilling (GeoProbe®) drilling will be the preferred method for obtaining subsurface soil samples. However, other drilling methods may also be used if warranted by site conditions. Groundwater samples will be collected using bailers or peristaltic, bladder or submersible pumps. Soil vapor samples will be collected in SUMMA® canisters. Performing grab or composite sampling using appropriate hand-held sampling equipment will be the preferred method for waste characterization sampling.

4.1 UTILITY CLEARANCE

New York State law requires that New York 811 be notified at least three working days prior to subsurface work is conducted to initiate the utility locating activities. Companies with subsurface utilities present will locate and mark out subsurface utility lines. However, New York 811 contractors will only locate utilities on public property and rights-of-way.

Liberty will subcontract a subsurface utility locator to perform a geophysical survey of the proposed sampling locations and the building's partial basement prior to commencement of the Remedial Investigation. Subsurface anomalies, including utilities, will be clearly marked with spray paint, chalk or flags. A Liberty representative will be on-site during the subsurface investigation to record the locations of subsurface anomalies identified by the subcontractor.

4.2 DIRECT PUSH DRILLING AND SOIL SAMPLING

This drilling method is typically used to collect shallow overburden soils. Sampling will be performed using four or five-foot-long acetate sleeves that will be advanced continuously to the desired depth below the surface. Soil samples from each sleeve will be screened using a photoionization detector (PID) to detect possible organic vapors. Organic vapor screening will be performed by slicing open the acetate sleeve, making a small slice in the soil column with a clean knife or sampling tool, inserting the PID probe and pushing the slice closed, and monitoring the soil for approximately 5 to 10 seconds. This procedure will be repeated at intervals along the soil column at the field geologist's discretion.

The samples will be examined for staining, discoloration, odors, and debris indicative of contamination (ash, coal fragments, wood chips, cinders, petroleum staining, etc.). Samples for laboratory analysis will be collected from the six-inch intervals of shallow fill and underlying soil material most likely to be contaminated, based on PID readings, discoloration, staining, and the field geologist's judgment (field conditions may require a section longer than six inches to make sufficient sample; however, this decision will be field based).

Soil samples collected for CVOC/VOC analysis will be collected by inserting a laboratory-supplied, single-use transfer tool such as a Terre Core™ sampler into the soil core to retrieve the sample. The samples will be placed directly into laboratory-supplied, pre-preserved sample containers as per EPA sampling method 5035A. Samplers will wear phthalate-free gloves such as nitrile (no latex will be used) and will avoid contact of the gloves with the sample. Clean metal/disposable instruments will be used to transfer samples. If there is insufficient soil volume in the soil core, then this will be made up by attempting a second direct push sleeve at the same depth, or by using the next immediate sample interval above or below this depth, if appropriate. If there is no recovery, then the sample depth will be skipped, and drilling will progress to the next depth interval.

Soil samples will be transported to a NYSDOH ELAP certified laboratory, under proper chain of custody procedures for analysis. Once the sample containers are filled, they will be immediately placed in the cooler with ice (in Ziploc plastic bags to prevent leaking) to maintain the samples at below 4°C.

4.3 PERMANENT WELL INSTALLATION AND SAMPLING

Groundwater sampling of permanent monitoring wells is described according to the following distinct phases of this work: well installation/construction, well development, well purging, and well sampling.

4.3.1 Well Installation and Construction

To collect representative groundwater samples, soil borings drilled with the direct push or sonic drilling method will be converted into permanent two-inch diameter monitoring wells. Groundwater monitoring wells will be constructed of threaded two-inch diameter PVC well casing and 10-slot well screen (to investigate the potential of floating product). The screen will be set at least five feet below the measured water table and will extent at least five feet above the water table. Clean silica sand, Morie No. 1 or equivalent, will be placed in the annular space around the well to a minimum of one foot above the top of the well screen, two feet being optimal. Solid PVC riser, attached to the well screen, will extend to grade. For a two-inch diameter well, the annular space for the filter pack should be 4 inches meaning a minimum six-inch diameter soil boring. In general, direct push borings will be enlarged by running hollow stem augers after soil sampling is complete and the permanent wells will be installed within the borehole. A two-foot-thick bentonite seal will then be placed above the sand pack and moistened with potable water for a minimum of 15 minutes before backfilling the remaining space with bentonite chips. If warranted by depth, filling will be completed using bentonite grout and a tremie pipe placed below the surface of the grout. A flush-mount protective manhole with a locking well cap will then be installed, and a measuring point marked on each PVC well riser. Well construction diagrams will be prepared for each well.

4.3.2 Well Development

Following installation, the groundwater monitoring wells will be developed using a submersible pump (or equivalent) until the water is reasonably free of turbidity and field readings (pH,

conductivity, temperature, and dissolved oxygen) sufficiently stabilize. Fifty nephelometric turbidity units (NTUs) or less will be the turbidity goal but not an absolute value. The wells will be developed aggressively to remove fines from the formation and sand pack. The wells will be allowed to equilibrate for 14 days prior to sampling. The volume of water removed, the well development time, and field instrument readings will be recorded in field notes.

4.3.3 Well Purging

The objective is to purge monitoring wells until turbidity stabilizes to a level as low as possible and this parameter will be given the greatest weight in determining when groundwater sampling may begin. With this objective in mind, a low-flow pump will be used to avoid entrainment of particulates within the well or from the formation. Groundwater from each well will be purged until parameters have stabilized. A turbidity level of fifty NTUs or less is the well purging goal, but not an absolute value before sampling. Other field parameters including temperature, conductivity, pH, and dissolved oxygen (DO) will also be monitored. As practical, all field measurements will be taken from the flow cell and will be recorded during and after purging, and before sampling. Field parameters should generally be within stability ranges specified under United States Environmental Protection Agency (USEPA) low-flow sampling methodology for three consecutive readings, one minute or more apart, prior to sampling.

Upon opening each monitoring well and point, the concentration of VOCs in the headspace will be measured using a PID and water level measurements will be recorded using an electronic interface probe. The depth to product (if present), depth to water, and the total depth will be measured from the top of the marked PVC casings. Before sampling, the wells will be purged utilizing a low-flow submersible pump using high-density polyethylene (HDPE) tubing connected to a flow cell. Very low purging rates are proposed, on the order of 100 ml/minute to 500 ml/minute, to minimize suspension of particulate matter in the well.

Purging will be done with the pump intake placed at the midpoint of the well screen or the midpoint of the water column (to be determined based on the depth and length of the screen interval) to ensure that stagnant water in the well is removed, while not stirring up sediment that may have accumulated on the bottom of the well. Equipment will be lowered into the well very carefully to prevent suspension of bottom sediment and subsequent entrainment onto sampling equipment. Surging will be avoided. Tubing will be replaced between each well. Pumps must be carefully cleaned between wells according to the procedures specified in Section 4.15. Ideally, pumping rates will be at a rate so that no drawdown of the groundwater level occurs (i.e., pumping rate is less than recharge rate). During purging, the sampler will actively monitor and track the volume of water purged, the depth to water within the well, and the field parameter readings. Data will be recorded in the field sampling form.

4.3.4 Well Sampling

Once groundwater conditions have stabilized, samples will be collected from the flow cell outlet (connected to the low-flow peristaltic pump) per USEPA low-flow sampling methods. All non-disposable/non-dedicated (re-usable) sampling equipment will be cleaned according to the procedures specified in Section 4.9.

Sampling will be performed with the pump intake at the same location used for purging. Pumping rates for withdrawing the samples will be similar to those followed for well purging; however pumping rates for VOC sample collection will be less than 200 ml/minute.

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The samples will be collected in laboratory-supplied sample bottles (pre-preserved, if appropriate), placed in iced coolers, and removed from light immediately after collection. In addition, all sample bottles must be filled to the top so that no aeration of the samples occurs during transport. All bottles will be filled to avoid cascading and aeration of the samples, the goal being to minimize any precipitation of colloidal matter. Samples will be transported to a NYSDOH ELAP certified laboratory under proper chain of custody procedures for analysis.

4.3.5 Borehole Abandonment

Soils extracted during the advancement of the borings will be used to backfill the borings, provided that the borings are not to be used for installation of permanent monitoring wells. However, soils that exhibit "gross" contamination, as evidenced by staining or free-phase product, or any visual, olfactory, or PID readings greater than 50 ppm above background, will be managed in accordance with Section 9. In this event, bentonite chips or pellets to within 0.5 feet below ground surface. The ground surface will be restored to a similar condition as the surrounding grade (e.g., asphalt, or concrete).

4.3.6 Monitoring Well Abandonment

There may be occasions when monitoring wells will require abandonment. For permanent overburden and bedrock monitoring wells, depending on the site-specific subsurface geologic conditions and nature of contamination, the abandonment approach will be in accordance with NYSDEC Policy CP-43 – Groundwater Monitoring Well Decommissioning Policy.

4.4 WASTE CHARACTERIZATION SAMPLING

Waste classification sampling may be conducted to characterize soil, liquids, and/or groundwater for the purpose of proper off-site waste disposal. Specific methods for sampling liquid and solid wastes are briefly discussed below.

4.4.1 Solid Waste

Solid sampling methods include utilizing dedicated stainless steel or HDPE scoops or shovels as the preferred method for sampling solids from piles or containers.

4.4.2 Liquid Waste

Liquid sampling methods include utilizing dedicated dippers, glass tube samplers, pump, and tubing, kemmerer bottles, and Bacon Bomb samplers. Dippers are used to collect samples from the surface of the liquid and are appropriate for homogeneous wastes. Glass tube samplers consist of glass tubes of varying length and diameter used to collect a full-depth liquid sample from a drum or similar container. Pump and tubing (e.g., bladder pump or peristaltic pump) are used to collect liquid samples from a depth (up to approximately 20 feet below grade), and are typically relied upon for sampling subsurface structures, such as underground storage tanks. To minimize the loss of volatile organic components in the liquid, the lowest achievable flow rate is utilized for collecting the sample by this method. Kemmerer bottles and Bacon Bomb samplers are discrete-depth samplers. These samplers are lowered into the liquid and opened to collect a sample at a desired depth.

4.4.3 Grab versus Composite Sampling

Waste characterization of a liquid or a solid can involve grab or composite sampling depending upon the homogeneity and the volume of the waste. Grab sampling consists of collecting a discrete sample or samples of a material and submitting each sample for separate analysis. Grab sampling is appropriate for characterizing small quantities of waste as well as waste streams of varying content (e.g., drums of different contents). Composite sampling consists of taking discrete grab samples of a material and combining them into a smaller number of samples for analysis. Composite sampling generally is appropriate for large volumes of homogenous waste material, such as a pile of soil or construction debris. The specific number of composite and grab samples will depend upon the size and nature of the waste pile (i.e., cubic yards) as well as the analysis required for characterization of the waste.

4.5 SUB-SLAB SOIL GAS SAMPLING

A concrete hammer drill will be used to drill a 5/8-inch borehole through the concrete floor slab. The borehole will then be advanced an additional 2 inches below the slab and a stainless-steel Vapor Pin™ sampling implant fitted with a silicone sleeve will be installed in the 5/8-inch borehole. The silicone sleeve will provide an airtight seal between the Vapor Pin™ and floor slab, and an air-tight cap will be installed on the Vapor Pin™ to prevent vapor transmission while vapor conditions below the pad are permitted to equilibrate. A sampling train containing stainless steel ball valves, air-tight fittings, Teflon tubing, a flow controller and an evacuated Summa™ canister will be attached to each Vapor Pin™ and a shut-in leak test will be performed on the sampling train. SUMMA™ canisters are passivated stainless-steel vessels that have been cleaned and certified contaminant-free by the contract laborer. Prior to sampling, purging of at least two volumes of air from the vapor point and sampling train will be performed with a personal sampling pump at a rate of 150 ml/minute. The sub-slab soil vapor samples will be collected in 6-liter Summa® canisters equipped with 150 ml/minute flow regulators, and leak tests will be performed using helium tracer gas to verify the integrity of the floor seals and tubing connections of the Vapor Pins™. Subsequent

rounds of soil gas sampling would include the use of tracer gas only if the initial round of sampling indicates that outdoor air has the potential to influence soil gas sample results.

When soil vapor samples are collected, the following conditions that may influence the interpretation of results will be documented:

- Identification of any nearby commercial or industrial buildings that likely use volatile organic compounds;
- A sketch of the Site, showing streets, neighboring commercial or industrial facilities (with estimated distances to the Site, and soil-gas sampling locations);
- Weather conditions (e.g., precipitation, outdoor temperature, barometric pressure, wind speed and direction); and
- Any pertinent observations, such as odors or readings from field instrumentation.

4.6 INDOOR AND AMBIENT AIR SAMPLING

Indoor and outdoor ambient air samples will be collected with an evacuated laboratory-supplied 6-liter SUMMA™ canister. The sample will be set at an elevation of approximately 4 to 5 feet above grade, to represent breathing zone air quality conditions. The samples will collected over an 8-hour period to simulate a non-residential exposure. After collecting the ambient air sample, the valve will be closed, and the canister will be labeled with the necessary information.

When indoor and ambient air samples are collected, the following conditions that may influence the interpretation of results will be documented:

- Identification of any nearby commercial or industrial buildings that likely uses volatile organic compounds;
- A sketch of the Site, showing streets, neighboring commercial or industrial facilities (with estimated distances to the Site, and soil-gas sampling locations);
- Weather conditions (e.g., precipitation, outdoor temperature, barometric pressure, wind speed and direction); and
- Any pertinent observations, such as odors or readings from field instrumentation.

4.7 QC SAMPLE COLLECTION

QC samples will include equipment blanks, trip blanks, field duplicates and MS/MSDs.

Equipment blanks will consist of distilled water and will be used to check for potential contamination of the equipment that may cause sample contamination. Equipment blanks will be collected by routing the distilled water through the sampling equipment prior to sample collection. Equipment blanks will be submitted to the laboratory at a frequency of one per day per matrix per

type of equipment being used per parameter. Equipment blanks will not be collected with soil gas or indoor/ambient outdoor air samples.

Trip blanks will consist of distilled water (supplied by the laboratory) and will be used to assess the potential for volatile organic compound contamination of groundwater samples due to contaminant migration during sample shipment and storage. Trip blanks will be transported to the site unopened, stored with the investigative samples, and kept closed until analyzed by the laboratory. Trip blanks will be submitted to the laboratory at a frequency of one per cooler that contains groundwater samples for analysis for VOCs.

Field duplicates are an additional aliquot of the same sample submitted for the same parameters as the original sample. Field duplicates will be used to assess sampling and analytical reproducibility. Field duplicates will be collected by alternately filling sample bottles from the source being sampled. Field duplicates will be submitted at a frequency of one per 20 samples for all matrices and all parameters with the exception of samples collected for waste characterization purposes. Soil gas field duplicates will be obtained by using a tubing a T-splitter.

MSs and MSDs are two additional aliquots of the same sample submitted for the same parameters as the original sample. However, the additional aliquots are spiked with the compounds of concern. Matrix spikes provide information about the effect of the sample matrix on the measurement methodology. MS/MSDs will be submitted at a frequency of one per 20 investigative samples per matrix for organic parameters for soil, sediment, and groundwater. MSs will be submitted at a frequency of one per 20 investigative samples per matrix for inorganic parameters.

4.8 SAMPLE PRESERVATION AND CONTAINERIZATION

The analytical laboratory will supply sample containers for all samples. These containers will be cleaned by the manufacturer to meet or exceed all analyte specifications established in the latest U.S. EPA's Specifications and Guidance for Contaminant-Free Sample Containers. Certificates of analysis are provided with each bottle lot and maintained on file to document conformance to EPA specifications. The containers will be pre-preserved, where appropriate (see Table 2). Table 6 presents a summary of QC sample preservation and container requirements.

4.9 EQUIPMENT DECONTAMINATION

4.9.1 Reusable Sampling Equipment

Stainless steel and aluminum sampling equipment shall be cleaned between each use in the following manner:

- Wash/scrub with a biodegradable degreaser ("Simple Green") if there is oily residue on equipment surface
- Tap water rinse
- Wash and scrub with Alconox and water mixture

- Tap water rinse
- Distilled/deionized water rinse
- Air dry

Cleaned equipment will be wrapped in aluminum foil if not used immediately after air-drying.

Groundwater sampling pumps will be cleaned by washing and scrubbing with an Alconox/water mixture, rinsing with tap water, and irrigating with distilled/deionized water.

4.9.2 Disposable Sampling Equipment

Disposable sampling equipment includes disposable gloves, bailers, string, tubing associated with groundwater sampling and purging pumps, or polyethylene sampling spatulas. Disposable sampling equipment will be used only once, and following its use, will be properly drummed or bagged for off-site disposal.

4.9.3 Heavy Equipment

Certain heavy equipment such as drilling augers may be used to obtain samples. Such equipment will be subject to high-pressure hot water or steam cleaning between uses. A member of the sampling team will visually inspect the equipment to check that visible contamination has been removed by similar procedure listed above prior to sampling and between drilling locations. All down-hole equipment will be cleaned prior to arrival on Site and between soil test borings. Drilling equipment decontamination will be performed on-site in temporary decontamination pads.

4.10 INVESTIGATION DERIVED WASTE

Field investigation derived waste (IDW) generated during drilling will be collected in properly labeled USDOT approved storage containers (55-gallon drums) and grouped by environmental matrix (soil, water, PPE/plastic, construction debris).

Drums will be tracked and given unique identification codes based on the following:

- A prefix indicating the drum's contents: i.e., S – Soil, W – Water, P – PPE/Plastic, and C&D – Construction Debris.

- Following the prefix and a hyphen will be the origin of the drum's contents. For example, drum S-SB-1, SB-2, SB-3 is a generated drum filled with soil from soil boring locations SB-1, SB-2, and SB-3; drum W-MW-1 is water generated from monitoring well MW-1.

- As drums are generated, their identification code, date of generation, contents, source (i.e., drill cuttings from location x, purge water from well y), and date sampled will be entered on a tracking table.

- For example, the full nomenclature of S-2/SB-2 110724 would be the second drum produced during the program with its contents from Soil Boring No. 2 generated on November 7, 2024.

The drums will be centrally stored on-Site. Subsequently, the waste soils and/or water will be characterized with laboratory analyses for proper disposal. Waste transportation and disposal of all contaminated wastes will be managed by Liberty and the subcontractor. Liberty anticipates that drummed IDW will be disposed at a permitted disposal facility. Liberty will retain copies of each waste disposal manifest for documentation.

5 DOCUMENTATION AND CHAIN OF CUSTODY

5.1 SAMPLE COLLECTION DOCUMENTATION

5.1.1 Field Notes

Field team members will keep a field notes to document all field activities. Field notes will provide the means of recording the chronology of data collection activities performed during the remediation. As such, entries will be described in as much detail as possible so that a particular situation could be reconstructed without reliance on memory.

The field notes will be dated, legible, and contain accurate and inclusive documentation of the activity. Field note entries will contain a variety of information. At the beginning of each entry, the date, start time, weather, and names of sampling team members present will be entered. Each page of the field notes will be signed and dated by the person making the entry. All entries will be made in permanent ink, signed, and dated and no erasures or obliterations will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark that is signed and dated by the sampler. The correction shall be written adjacent to the error.

Field activities will be fully documented. Information included in the field notes should include, but may not be limited to, the following:

- Chronology of activities, including entry and exit times
- Names of all people involved in sampling activities
- Level of personal protection used
- Any changes made to planned protocol
- Names of visitors to the site during sampling and reason for their visit
- Sample location and identification
- Changes in weather conditions
- Dates (month/day/year) and times (military) of sample collection
- Measurement equipment identification (model/manufacturer) and calibration information
- Sample collection methods and equipment
- Sample depths
- Whether grab or composite sample collected
- How sample composited, if applicable
- Sample description (color, odor, texture, etc.)
- Sample identification code

- Tests or analyses to be performed
- Sample preservation and storage conditions
- Equipment decontamination procedures
- QC sample collection
- Unusual observations
- Record of photographs
- Sketches or diagrams
- Signature of person recording the information

Field notes will be reviewed on a daily basis by the Project Manager. Field notes will be supported by standardized forms.

5.1.2 Chain-of-Custody Records

On a regular basis (daily or on such a basis that all holding times will be met), samples will be transferred to the custody of the respective laboratories, via third-party commercial carriers or via laboratory courier service.

Chain-of-custody records are initiated by the samplers in the field. The field portion of the custody documentation should include: (1) the project name; (2) signatures of samplers; (3) the sample number, date and time of collection, and whether the sample is grab or composite; (4) signatures of individuals involved in sampling; and (5) if applicable, air bill or other shipping number. Sample receipt and log-in procedures at the laboratory are described in Section 5.2.2 of this Plan.

5.1.3 Sample Labeling

Immediately upon collection, each sample will be labeled with a pre-printed adhesive label, which includes the date and time of collection, sampler's initials, tests to be performed, preservative (if applicable), and a unique identifier.

A. The following identification scheme will be used:

Soil borings will be assigned sequential numbers. For soil samples collected from soil borings, sample numbers will be assigned as follows:

SB-#(sampling interval)
Example:
Sample SB-4(4-6') = soil sample collected from soil boring #4 at a depth of 4-6' below grade.

Groundwater wells will be assigned sequential numbers. Groundwater samples will be identified by the well that the sample was collected from.

Example:
MW-1 = groundwater sample collected from permanent well point #1

Sub-slab soil vapor/soil vapor/ambient air will be assigned sequential numbers. Sub-slab vapor samples will be identified by the soil vapor point that the sample was collected from. Indoor air samples will be co-located with the sub-slab soil vapor points and identified with the prefix IA, followed by a hyphen and the number of the sub-slab soil vapor point.
Examples:
SV-1 = Soil vapor sample collected from the soil gas point #1
IA-1 = Indoor air sample co-located with soil gas point SV-1
OA-1 = Outdoor ambient air sample

Duplicate samples will be labeled as blind duplicates by giving them sample numbers indistinguishable from a normal sample.

Blanks should be spelled out and identify the associated matrix, e.g., Equipment Blank, Soil

MS/MSDs will be noted in the Comments column of the COC.

B. The analysis required will be indicated for each sample.
Example: SVOC

C. Date taken will be the date the sample was collected, using the format: MM-DD-YY.
Example: 11-07-24

D. Time will be the time the sample was collected, using military time.
Example: 14:30

E. The sampler's name or initials will be printed in the "Sampled By" section.

F. Other information relevant to the sample.
Example: Equipment Blank

An example sample label is presented below:

Job No:	XXXXXXXXX
Client:	Name
Sample No:	SB-01(5-5.5')

Matrix:	Soil
Date Taken:	11/07/24
Time Taken:	14:30
Sampler:	M. Frey
Analysis:	SVOC

This sample label contains authoritative information for the sample. Inconsistencies with other documents will be settled in favor of the vial or container label unless otherwise corrected in writing from the field personnel collecting samples or the QEP.

5.2 SAMPLE CUSTODY

Custody is one of several factors that are necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for admissibility: relevance and authenticity. Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final evidence files.

A sample or evidence file is considered to be under a person's custody if:

- the item is in the actual possession of a person
- the item is in the view of the person after being in actual possession of the person
- the item was in the actual physical possession of the person, but is locked up to prevent tampering
- the item is in a designated and identified secure area

5.2.1 Field Custody Procedures

Samples will be collected following the sampling procedures documented in Section 4 of this Plan. Documentation of sample collection is described in Section 5.1 of this Plan. Sample chain-of-custody and packaging procedures are summarized below. These procedures are intended to ensure that the samples will arrive at the laboratory with the chain-of-custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or dispatched properly. Field procedures have been designed such that as few people as possible will handle the samples.
- All bottles will be identified by the use of sample labels with sample numbers, sampling locations, date/time of collection, and type of analysis.

- Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample label because the pen would not function in wet weather.

- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage location.

- All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and copies will be retained by the sampler and placed in the project files.

- Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. If third party commercial carriers are used for transfer to the laboratory, shipping containers will be secured with strapping tape and custody seals prior to shipment. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by field personnel. The cooler will be strapped shut with strapping tape in at least two locations.

- If the samples are sent by third party commercial carrier, the air bill will be used. Air bills will be retained as part of the permanent documentation. Commercial carriers are not required to sign off on the custody forms since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.

- Samples remain in the custody of the sampler until transfer of custody is completed. This consists of delivery of samples to the laboratory courier or sample custodian, and signature of the laboratory courier or sample custodian on chain-of-custody document as receiving the samples and signature of sampler as relinquishing samples.

5.2.2 Laboratory Custody Procedures

Samples will be received and logged in by a designated sample custodian or his/her designee. Upon sample receipt, the sample custodian will:

- Examine the shipping containers to verify that the custody tape is intact,

- Examine all sample containers for damage,

- Determine if the temperature required for the requested testing program has been maintained during shipment and document the temperature on the chain-of-custody records,

- Compare samples received against those listed on the chain-of-custody,
- Verify that sample holding times have not been exceeded,
- Examine all shipping records for accuracy and completeness,
- Determine sample pH (if applicable) and record on chain-of-custody forms,
- Sign and date the chain-of-custody immediately (if shipment is accepted) and attach the air bill,
- Note any problems associated with the coolers and/or samples on the cooler receipt form and notify the Laboratory Project Manager, who will be responsible for contacting the QEP,
- Attach laboratory sample container labels with unique laboratory identification and test, and
- Place the samples in the proper laboratory storage.

Following receipt, samples will be logged in according to the following procedure:

- The samples will be entered into the laboratory tracking system. At a minimum, the following information will be entered: project name or identification, unique sample numbers (both client and internal laboratory), type of sample, required tests, date and time of laboratory receipt of samples, and field ID provided by field personnel.
- The Laboratory Project Manager will be notified of sample arrival.
- The completed chain-of-custody, air bills, and any additional documentation will be placed in the final evidence file.

6 CALIBRATION PROCEDURES

6.1 FIELD INSTRUMENTS

Field instruments will be calibrated according to the manufacturer's specifications. Calibration procedures performed will be documented in the logbook for the instrument and will be referenced field notes. Procedures to be documented will include the date/time of calibration, name of person performing the calibration, reference standard used, temperature at which the calibration was performed, and pre- and post- calibration the readings.

6.2 LABORATORY INSTRUMENTS

Calibration procedures for a specific laboratory instrument will consist of initial calibrations, initial calibration verifications, and/or continuing calibration verification. Detailed descriptions of the calibration procedures for a specific laboratory instrument are included in the laboratory's standard operating procedures (SOPs), which describe the calibration procedures, their frequency, acceptance criteria, and the conditions that will require recalibration. These procedures are as required in the respective analytical methodologies (summarized in Table 2 of this Plan). The initial calibration associated with all analyses must contain a low-level calibration standard which is less than or equal to the quantitation limit.

7 SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

No field analyses are anticipated for this program. If site conditions were to warrant field analysis, the responsible contractor will prepare an addendum establishing the field analytical procedures. Analyses of all samples will be performed by NYSDOH ELAP certified laboratories. Table 2 summarizes the analytical methods to be used during the remediation.

8 DATA REDUCTION, VALIDATION, AND REPORTING

Appropriate QC measures will be used to ensure the generation of reliable data from sampling and analysis activities. Proper collection and organization of accurate information followed by clear and concise reporting of the data is a primary goal in this project. Complete data packages suitable for data validation will be provided by the analytical laboratory.

For all analyses, the laboratory will report results that are below the laboratory's reporting limit; these results will be qualified as estimated (J) by the laboratory. The laboratory may be required to report tentatively identified compounds (TICs) for the VOC and SVOC analyses; this will be requested by the sampler on an as-needed basis. A Data Usability Summary Report (DUSR) will be prepared and will be included in the Remedial Investigation Report (RIR). A DUSR preparer for the Remedial Investigation has not been employed.

8.1 DATA EVALUATION/VALIDATION

8.1.1 Field Data Evaluation

Measurements and sample collection information will be transcribed directly into the field notes or onto standardized forms. If errors are made, results will be legibly crossed out, initialed, and dated by the person recording the data, and corrected in a space adjacent to the original (erroneous) entry. Daily reviews of the field records by the Project Manager will ensure that:

- Field notes and standardized forms have been filled out completely and that the information recorded accurately reflects the activities that were performed.
- Records are legible and in accordance with good record keeping procedures, i.e., entries are signed and dated, data are not obliterated, changes are initialed, dated, and explained.
- Sample collection, handling, preservation, and storage procedures were conducted in accordance with the protocols described in the Plan, and that any deviations were documented and approved by the appropriate personnel.

8.1.2 Data Usability

A Data Usability Summary Report (DUSR) will be prepared in accordance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

The data usability evaluation will include reviewing the quality assurance/quality control (QA/QC) information including: (1) chain-of-custody; (2) the summary QA/QC information provided by the laboratory; and (3) the project narrative.

For each data package the following questions will be evaluated:

- Is the data package complete as defined under the requirements for the NYSDEC ASP Category B, USEPA CLP deliverables or other standards/guidance?

- Have all holding times and preservation requirements been met?

- Do the quality control (QC) data fall within the laboratory and project established limits and specifications?

8.2 IDENTIFICATION AND TREATMENT OF OUTLIERS

Any data point which deviates markedly from others in its set of measurements will be investigated; however, the suspected outlier will be recorded and retained in the data set. One or both of the following tests will be used to identify outliers.

Dixon's test for extreme observations is an easily computed procedure for determining whether a single very large or very small value is consistent with the remaining data. The one-tailed t-test for difference may also be used in this case. It should be noted that these tests are designed for testing a single value. If more than one outlier is suspected in the same data set, other statistical sources may be consulted and the most appropriate test of hypothesis will be used and documented, if warranted.

Since an outlier may result from unique circumstances at the time of sample analysis or data collection, those persons involved in the analysis and data reduction will be consulted. This may provide a reason for the outlier. Further statistical analysis may be performed with and without the outlier to determine its effect on the conclusions. In many cases, two data sets may be reported, one including, and one excluding the outlier.

In summary, every effort will be made to include the outlying values in the reported data. If the value is rejected, it will be identified as an outlier, reported with its data set and its omission noted.

9 INTERNAL QUALITY CONTROL

The subcontracting laboratories' Quality Assurance Project Plans will identify the supplemental internal analytical quality control procedures to be used. At a minimum, this will include:

- Matrix spike and/or matrix spike duplicate samples
- Matrix duplicate analyses
- Laboratory control samples
- Instrument calibrations
- Instrument tunes for SW-846 8260B and 8270C and EPA Method TO-15 analyses
- Method and/or instrument blanks
- Surrogate spikes for organic analyses
- Internal standard spikes for SW-846 8260B and 8270C and EPA Method TO-15 analyses
- Quantitation limit determination and confirmation by analysis of low-level calibration standard

As outlined on Table 5 and summarized in Section 4.7, field quality control samples will include:

- Equipment blanks
- Field duplicate samples
- Trip blanks
- MS/MSDs

10 CORRECTIVE ACTION

The entire sampling program will be under the direction of the QEP. The emphasis in this program is on preventing problems by identifying potential errors, discrepancies, and gaps in the data-collection-laboratory-analysis-interpretation process. Any problems identified will be promptly resolved. Likewise, follow-up corrective action is always an option in the event that preventative corrective actions are not totally effective.

The acceptance limits for the sampling and analyses to be conducted in this program will be those stated in the method or defined by other means in the Plan. Corrective actions are likely to be immediate in nature and most often will be implemented by the contracted laboratory analyst or the Project Manager. The corrective action will usually involve recalculation, reanalysis, or resampling.

10.1 IMMEDIATE CORRECTIVE ACTION

Corrective action in the field may be needed when the sample network is changed (i.e., more/less samples, sampling locations other than those specified in the Plan), or when sampling procedures and/or field analytical procedures require modification, etc. due to unexpected conditions. The field team may identify the need for corrective action. The Field Team Leader will approve the corrective action and notify the Project Manager. The Project Manager will approve the corrective measure. The Field Team Leader will ensure that the corrective measure is implemented by the field team. Corrective actions will be implemented and documented in the field logbook. Documentation will include:

- A description of the circumstances that initiated the corrective action,
- The action taken in response,
- The final resolution, and
- Any necessary approvals

No staff member will initiate corrective action without prior communication of findings through the proper channels.

Corrective action in the laboratory may occur prior to, during, and after initial analyses. A number of conditions such as broken sample containers, omissions or discrepancies with chain-of-custody documentation, low/high pH readings, and potentially high concentration samples may be identified during sample log-in or just prior to analysis. Following consultation with laboratory analysts and Laboratory Section Leaders, it may be necessary for the Laboratory QA Manager to approve the implementation of corrective action. The laboratory SOPs specify some conditions during or after analysis that may automatically trigger corrective action or optional procedures. These conditions

may include dilution of samples, additional sample extract cleanup, automatic reinjection/reanalysis when certain QC criteria are not met, loss of sample through breakage or spillage, etc.

The analyst may identify the need for corrective action. The Laboratory Section Leader, in consultation with the staff, will approve the required corrective action to be implemented by the laboratory staff. The Laboratory QA Manager will ensure implementation and documentation of the corrective action. If the nonconformance causes project objectives not to be achieved, the QEP will be notified. The QEP will notify the Project Manager, who in turn will contact all levels of project management for concurrence with the proposed corrective action.

These corrective actions are performed prior to release of the data from the laboratory. The corrective action will be documented in both the laboratory's corrective action files, and the narrative data report sent from the laboratory to the Program Manager. If the corrective action does not rectify the situation, the laboratory will contact the Program Manager, who will determine the action to be taken and inform the appropriate personnel.

If potential problems are not solved as an immediate corrective action, the contractor will apply formalized long-term corrective action, if necessary.

TABLES

Table 1 A
Soil Criteria Table

276-284 Starr Street Site
Brooklyn, New York
BCP Site No. TBD
QAPP/FSP

Contaminant	Protection of Public Health					Protection of Ecological Resources[n]	Protection of Groundwater
	Unrestricted Use	Residential	Restricted-Residential	Commercial	Industrial		
All soil cleanup objectives (SCOs) are in parts per million (ppm); approximately equivalent to mg/kg.							
Volatiles							
1,1,1-Trichloroethane	0.68	100 [a]	100 [a]	500 [b]	1,000 [c]	No Standard	0.68
1,1-Dichloroethene	0.33	100 [a]	100 [a]	500 [b]	1,000 [c]	No Standard	0.33
cis-1,2-Dichloroethene	0.25	59	100 [a]	500 [b]	1,000 [c]	No Standard	0.25
Benzene	0.06	2.9	4.8	44	89	70	0.06
Carbon tetrachloride	0.76	1.4	2.4	22	44	No Standard	0.76
Cyclohexane	No Standard	No Standard	No Standard	No Standard	No Standard	No Standard	No Standard
Ethylbenzene	1	30	41	390	780	No Standard	1
Methylene chloride	0.05	51	100 [a]	500 [b]	1,000 [c]	12	0.05
Tetrachloroethene	1.3	5.5	19	150	300	2	1.3
Toluene	0.7	100 [a]	100 [a]	500 [b]	1,000 [c]	36	0.7
Trichloroethene	0.47	10	21	200	400	2	0.47
Vinyl chloride	0.02	0.21	0.9	13	27	No Standard	0.02
Xylene (mixed)	0.26	100 [a]	100 [a]	500 [b]	1,000 [c]	0.26	1.6

Notes:
[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm.
[b] The SCOs for commercial use were capped at a maximum value of 500 ppm.
[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm.

Table 1B

Groundwater Criteria Table

276 - 284 Starr Street Site

Brooklyn, New York

BCP Site No. TBD

Contaminant	Aqueous Water Quality Standards[1], ug/L
VOCs	
1,1,1-Trichloroethane	5
1,1-Dichloroethene	5
cis-1,2-Dichloroethene	5
Benzene	1
Carbon tetrachloride	5
Cyclohexane	No Standard
Ethylbenzene	5
Methylene chloride	5
Tetrachloroethene	5
Toluene	5
Trichloroethene	5
Vinyl Chloride	2.0
Xylene (mixed)	5

Notes:

1 - Division of Water Technical and Operational Guidance Values (TOGS)
Ambient Water Quality Standards and Guidance Values (AWQS), ug/L

Table 1C

Soil Vapor and Indoor Air Criteria Table

276 - 284 Starr Street Site

Brooklyn, New York

BCP Site No. TBD

Contaminant	NYSDOH Vapor Intrusion Decision Matrix	NYSDOH Soil Vapor Mitigation Criteria[1], ug/m^3	NYSDOH Indoor Air Mitigation Criteria[2], ug/m^3
VOCs			
1,1,1-Trichloroethane	B	1,000 and above	10 and above
1,1-Dichloroethene	B	60 and above	1 and above
cis-1,2-Dichloroethene	B	60 and above	1 and above
Benzene	D	600 and above	10 and above
Carbon tetrachloride	A	60 and above	1 and above
Cyclohexane	D	600 and above	10 and above
Ethylbenzene	D	600 and above	10 and above
Methylene chloride	B	1,000 and above	10 and above
Tetrachloroethene	B	1,000 and above	10 and above
Toluene	F	3,000 and above	50 and above
Trichloroethene	A	60 and above	1 and above
Vinyl Chloride	A	60 and above	0.2 and above
o-Xylene	D	600 and above	10 and above
m- &p-Xylenes	E	2,000 and above	20 and above

Notes:

1. Values represent the third row sub-slab vapor concentrations from NYSDOH Soil Vapor/Indoor Air Decision Matrices A-F.
2. Values represent the third column indoor air concentrations from NYSDOH Soil Vapor/Indoor Air Decision Matrices A-F.

TABLE 2

Typical Analytical Parameters, Methods, Preservation, Holding Time and Container Requirements

276 - 284 Starr Street Street Site
Brooklyn, New York
BCP Site No. TBD

Sample Matrix	Analytical Parameter	Numer of Samples[1]	EPA Analytical Method	Sample Preservation	Holding Time[2]	Sample Container[3]
Soil	VOCs /CVOCs (TCL)	20	SW-846 Method 8260C/5035	Cool to 4^0 C; no headspace	14 days to analysis	(3) Terra-Core Vials
Groundwater	VOCs /CVOCs (TCL)	5	SW-846 Method 8260C	HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) Vials
Soil Gas & Ambient Air	VOCs / CVOCs	4	EPA Method TO-15	None	14 days to analysis	(1) Evacuated 6-Liter SUMMA® canister

Notes:
1 Actual number of samples may vary depending on field conditions, sample material availability, and field observations. See RIWP for estimates.
2 Holding times listed are method holding time calculated from time of collection and not NYSDEC ASP holding times.
3 MS/MSDs require duplicate volume for all parameters for solid matrices; MS/MSDs require triplicate volume for organic parameters for aqueous matrices

Table 3

Typical Laboratory Data Quality Objectives
Soil Samples
9 N. 15th Street., Brooklyn, NY
BCP Site No. TBD

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
VOCs / CVOCs (TCL)	SW-846 Methods 8260B/5035	Soil	Surrogates % Rec. 1,2-Dichloroethane-d4 70-130 4-Bromofluorobenzene 70-130 Dibromofluoromethane 70-130 Toluene-d8 70-130 2-Chloroethoxyethane 70-130 Matrix Spikes	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 30 per matrix type	Field Duplicates RPD <30 MS/MSDs (RPD) RPD <30	Field Duplicates: One per 20 per soils MS/MSDs: One per 30 per matrix type

Table 4

Typical Laboratory Data Quality Objectives
Groundwater Samples
9 N. 15th Street., Brooklyn, NY
BCP Site No. TBD

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
VOCs (TCL)	SW-846 Method 8260C	Groundwater	Surrogates % Rec. 1,2-Dichloroethane-d4 70-130 4-Bromofluorobenzene 70-130 Dibromofluoromethane 70-130 Toluene-d8 70-130 Matrix Spikes 36-162 % recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <20 MS/MSDs (RPD) RPD <20	Field Duplicates: One per 20 MS/MSDs: One per 20 per

Table 5

Typical Laboratory Data Quality Objectives
Soil Vapor / Indoor Air Samples
9 N. 15th Street., Brooklyn, NY
BCP Site No. TBD

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
VOCs / CVOCs	EPA Method TO-15	Soil Vapor / Indoor Air	Surrogates % Rec. 4-Bromofluorobenzene 78-124	Surrogates: All samples, standards, QC samples	Matrix Duplicates RPD <30	Matrix Duplicates One per 20

Table 6
QC Sample Preservation and Container Requirements

276 - 284 Starr Street., Brooklyn, NY

BCP Site No. TBD

Sample Matrix	Analytical Parameter	No. of Samples	EPA Analytical Method	Sample Preservation	Holding Time[1]	Sample Container
Soil	VOCs / CVOCs	1	SW-846 Method 8260C/5035	Cool to 4^0 C MeOH; Na2SO4	14 days to analysis	(3) Terra Core Vials
Groundwater	VOCs / CVOCs	1	SW-846 Method 8260C	Cool to 4° C HCl; no headspace	14 days to extraction	(3) Vials
Soil Gas / Indoor Air	VOCs / CVOCs	1	EPA Method TO-15	None	14 days to analysis	(1) Evacuated 6-Liter SUMMA^R Canister

APPENDIX B:
Health and Safety Plan

Liberty Environmental, Inc.

Site Health & Safety Plan

1. General Information

Project: 276-284 Starr Street RI

Project Number: 220872.04

Site Location: 276-284 Starr Street

Project Manager: James P. Cinelli, P.E.

Prepared By: Michael Bingaman

Date: 6/5/2025

Approved By: (PM) (HSC)

Date: June 5, 2025 June 5, 2025

TEAM MEMBER	RESPONSIBILITIES
James P. Cinelli, P.E.	Project Manager
Jack R. Yekel	Site Health and Safety Representative/Field Geologist
Ethan Melniczek	Field Tech

Is a Dig Safe/One Call Required? ☒ Yes ☐ No

Serial No. To Be Determined

Valid Between:

---

2. Training and Medical Surveillance

Training Level Required:

☒ HAZWOPER 40/8 hour, First Aid, CPR

☐ Specialty (*e.g.,* confined space, lockout/tagout, Troxler radiation safety)

List:_____

Medical Surveillance Level Required

☒ HAZWOPER physical

☐ Special medical tests

List:_____

Exceptions/Modifications to training or medical surveillance required: None

3. Personal Protection

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

LOCATION	JOB FUNCTION	LEVEL OF PROTECTION
Soil Boring Locations	Sampling/Screening/Oversight	☒D ☐C ☐B ☐A
Monitoring Wells	Installation and sampling	☒D ☐C ☐B ☐A
Soil Vapor Point	Installation and sampling	☒D ☐C ☐B ☐A

Specific protective equipment for each level are as follows: [1]

Level A **Respiratory:** ☐ SCBA ☐ Air-Line Supplied Air Respirator ☐ Other (describe)	**Level B** **Respiratory:** ☐ SCBA ☐ Air-Line Supplied Air Respirator ☐ Other – Level C-D plus the following exceptions/modifications
Level C **Respiratory –** Air-purifying respirator with cartridge/canister type: ☐ HEPA, acid gas, organic vapors (*e.g.,* MSA GMC-H) ☐ HEPA only ☐ Other – Level D plus the following exceptions/modifications -	**Level D** **Respiratory – None** **Other:** ☒ Safety glasses ☒ Hard hat[2] ☒ Safety shoes ☒ Hearing prot.[3] ☐ Snake chaps/Gaiters[4] ☒ Protective clothing and/or gloves required (*i.e.,* modified Level D) ☐ Other (describe):
Other skin, eyes, and fall protection required: Gloves: ☐ Butyl rubber ☐ PVC-coated equivalent ☐ Neoprene ☒ Nitrile ☐ Other (describe) surgical	Protective clothing: ☐ Tyvek ® or equivalent ☐ Tyvek ® polyethylene-coated or ☐ Tyvek ® Saranex® or equivalent ☐ Other (describe)
Radiation Safety: ☐Dosimeter Badge ☐Other (describe)	

[1] See Liberty Health and Safety Manual for minimum criteria.

[2] Hard hats are only required when overhead hazards are expected, such as when drilling, advancing soil borings, and performing soil excavation activities.

[3] Hearing protection is required when site activities produce sounds greater than 85dB, such as when drilling, advancing soil borings, inside remediation systems, operating generators, activities around large machinery (vacuum trucks).

[4] Snake chaps are only required when site activities include walking through undeveloped areas where snake activity is known or when visibility is limited.

Criteria for changing protection levels are as follows:

CHANGE:	APPROVALS REQUIRED [1]		
	HSR	PM	CHSM
To Level C when PID deflections in the breathing zone exceed 10 ppm for a period of 60 minutes and engineering measures do not resolve the vapor issue.	☒	☒	☒
To Level when	☐	☐	☐
To Level when	☐	☐	☐
To Level when	☐	☐	☐
Evacuate the area when continuous PID reading is:			

[1] HSR: On-site Health & Safety Representative
PM: Project Manager
CHSM: Corporate Health & Safety Manager

Changes to the level of protection shall be made after the required approvals are obtained. All changes shall be recorded in the field log and reported to the HSC as soon as possible.

4. Air Monitoring

The following monitoring instruments shall be used on-site to measure airborne containment concentrations in the breathing zone:

	FREQUENCY OF MONITORING
☐ Combustible Gas Indicator	
☐ O_2 Monitor	Real-time in personal breathing space
☐ Colorimetric Tubes (type)	
☒ PID	Real-time monitoring
☐ FID	
☐ Other (specify) LEL	Real-time (in personal breathing space)

5. Site Control (Describe or attach sketch)

Work Zones:

Support Zone: Greater than 10 feet of heavy equipment or sampling area.

Contamination Reduction Zone (area used for decontamination): Within 10 feet of heavy equipment or sampling area.

Exclusion Zone (area considered contaminated): Within 10 feet of heavy equipment or sampling area.

Site Entry Procedures:

☒ Notify Site Health and Safety Representative.

☒ Read Health & Safety Plan and sign Acknowledgment Statement.

☐ Check in with facility security guard.

☒ Wear proper personal protective equipment.

☐ Attend facility orientation.

☒ Conduct "Toolbox" safety meeting.

☐ Other (specify):

Decontamination Procedures:

Personnel: shower as soon as practical

Equipment: power wash drill rig; alconox/potable water split-spoons; wipe PID with paper towel

Investigation-derived Material Disposal:

☒ *Leave on site for disposal.*

☐ *Other (describe)*

Work Limitations (time of day, buddy system, etc.): none

Troxler Radiation Safety:

☐ Radiation information is not applicable to this project.

☐ Notify RSO.

☐ Wear dosimeter badge when handling gauge.

☐ Post applicable radiation signs.

☐ Post emergency numbers.

☐ Provide at least two lock systems for overnight storage.

☐ Maintain storage at least 15 feet from full-time workstations.

☐ Block and brace gauge during "all" transportation.

☐ Limit "public" exposure to gauge while in use.

☐ Provide sketch of gauge storage to RSO.

6. Contingency Planning

LOCAL EMERGENCY RESOURCES:	
Ambulance:	911

Hospital Emergency Room:	911
Poison Control Center	New York (800) 222-1222
Police:	911
Fire Department:	911
USEPA Contact:	
Other (Troxler, NRC, Agreement State Agency, etc.):	

SITE RESOURCES:	
Water Supply (Type/Location):	Bring to site
Liberty Cell:	610-763-2340
Other:	

EMERGENCY CONTACTS:		
Liberty Technical Contact:	Michael Bingaman	(mobile phone) 610-858-1565
Liberty Project Manager	James P. Cinelli, P.E.	(mobile phone) 610-633-9780
Liberty Corporate Health & Safety Manager:	Dave Coyne, QEP	(office) 610-375-9301 (mobile phone) 484-955-7884
Radiation Safety Officer (RSO):		
Contractor Office Contact:	To Be Determined	
Field Contact:	Jack R. Yekel	215-390-6123
Client Contact:	Rob Solano	347-680-7069
Facility Manger:	Rob Solano	347-680-7069

EMERGENCY ROUTES (give directions or attach map):	
Nearest Hospital Name and Address:	Wycoff Heights Medical Center Emergency Room
	346 Stanhope Ave, Brooklyn, NY 11237
Emergency Room Phone Number	(718)-963-7391
Other Nearby Facility (Urgent Care, Patient First, …):	DOCs Urgent Care – Brooklyn 331 Knickerbocker Ave, Suite 760, Brooklyn, NY 11237

If an emergency develops at the site, the discoverer will take the following course of action:

- Notify the proper emergency services (fire, police, ambulance, etc.) for assistance. **Dial 911**
- Notify other affected personnel at the site.
- Contact Liberty and the client representative to inform them of the incident as soon as possible.
- Prepare a summary report of the incident for Liberty and the client representative.

Emergency Equipment Required On-site:

☒ First Aid/Bloodborne Pathogens Kit	☒ Fire Extinguisher
☒ Eye Wash	☐ Spill Control Media
☐ Shower	☐ Other: (describe)
☐ Other: (describe)	☐ Other: (describe)

7. Acknowledgement

Acknowledgement Statement:

I have reviewed the Hazard Assessment and Site Health & Safety Plan. I hereby acknowledge that I have received the required level of training and medical surveillance, that I am knowledgeable about the contents of this site-specific Health & Safety Plan, and that I will use personal protective equipment and follow procedures specified in the Health & Safety Plan.

Signatures of Liberty and Subcontractor Site Personnel (Required):

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

Attachments: Hazard Assessment
Map to Hospital

Attachment A

Hazard Assessment

1. General Information

Proposed Scope of Work and Specific Tasks (include all that apply):
Site Assessment
Drilling of Soil Borings
Collection of Soil Samples
Installation of Monitoring Wells
Groundwater Sampling
Sub-Slab Soil Vapor Point Installation
Sub-Slab Soil Vapor Point and Indoor Air Sampling
Management of Investigation-Derived Waste

Liberty Role On-site:

- ☐ Resident Project Representative (*e.g.,* "Observe and Document")
- ☒ Construction Manager (*e.g.,* Managing Contractor/General Contractor)
- ☐ Representative for Client (*e.g.,* "Agent for Owner")
- ☐ Other (describe)

Proposed Dates of On-site Work: To be Determined

Background Information Review: ☐ Preliminary ☒ Moderate ☐ Substantial

Documentation/Summary Overall Hazard: ☐ Serious ☒ Moderate ☐ Low ☐ Unknown

2. Site Characterization

Facility Description: Former Manufacturing Building/Documented Chlorinated VOCs in sub-slab vapor and indoor air.

Status: ☒ Active ☐ Inactive ☐ Unknown

Operations (current and past): Past:
Past: Machine shop, manufacturing.
Current: Offices

Unusual Features (utilities, terrain, etc.): None

History (worker or non-worker injury, complaints from public, previous agency action):
Unknown

3. Site Classification

Site Type Allocated:

☒ 1 Known or controlled hazards ☐ 2 Unknown and/or uncontrolled hazards ☐ 3 Regulated by 29 CFR 1910.120

Comments:

4. Hazard Evaluation

SUBSTANCE NAME	PHYSICAL STATE	KNOWN CONCENTRATION LEVELS PRESENT	POTENTIAL ROUTES OF EXPOSURE	ACGIH TLV	OSHA PEL
Benzene	Liquid/Vapor	5.69 ug/m^3 soil vapor	inhalation, skin absorption, ingestion, skin and/or eye contact		10 ppm
Toluene	Liquid/Vapor	59 ug/m^3 soil vapor	inhalation, skin absorption, ingestion, skin and/or eye contact		200 ppm
Ethylbenzene	Liquid/Vapor	1.4 ug/m^3 indoor air	inhalation, ingestion, skin and/or eye contact		100 ppm
1,1,1,trichloroethane	Liquid/Vapor	47.9 ug/m^3 soil vapor	inhalation, skin absorption, ingestion, skin and/or eye contact		100 ppm
Tetrachloroethene	Liquid/Vapor	1,180 ug/m^3 soil vapor	inhalation, skin absorption, ingestion, skin and/or eye contact		25 ppm
Total Xylenes	Liquid/Vapor	5 ug/m^3 soil vapor	inhalation, skin absorption, ingestion, skin and/or eye contact		100 ppm
1,1-dichloroethylene	Liquid/Vapor		inhalation, skin absorption, ingestion, skin and/or eye contact		100 ppm
cis-1,2-dichloroethene	Liquid, Vapor, or Solid	460 ug/m^3 soil vapor	inhalation, skin absorption, ingestion, skin and/or eye contact		20 ppm
Carbon Tetrachloride	Liquid/Vapor	4.59 ug/m^3 soil vapor	inhalation, skin absorption, ingestion, skin and/or eye contact		25 ppm
Methylene chloride	Liquid/vapor	3.37 ug/m^3 soil vapor	inhalation, ingestion, skin absorption, skin and/or eye contact		25 ppm
Trichloroethene	Liquid/Vapor	48,300 ug/m^3 soil vapor	inhalation, ingestion, skin absorption, skin and/or eye contact		25 ppm
Vinyl chloride	Liquid/Vapor		inhalation, ingestion, skin absorption, skin and/or eye contact		1 ppm
Cyclohexane	Liquid/Vapor	48 ug/m^3 soil vapor	inhalation, ingestion, skin absorption, skin and/or eye contact		300 ppm

This list is based on our preliminary evaluation, indicating that these are the major risks identified. Blanks indicate data not available.

Ionizing Radiation:

Did the "client" use radioactive materials on site, past or present: ☐ Yes (complete table below) ☒ No

Possibility of contamination or exposure due to past or present use of radioactive materials: ☐ Yes (complete table below) ☒ No

SOURCE	QUANTITY	PHYSICAL STATE	POTENTIAL OF EXPOSURE	CONTROL MEASURE

If the answers to the above questions are both No, this table will remain blank.

Will a nuclear moisture/density or XRF gauge be used on site? ☐ Yes (see below) ☒ No

If yes, will it be a Liberty gauge? ☐ Yes (see below) ☐ No (see Subcontractor H&S Qualifications/ Performance Form

If the answer to any questions in this section is "Yes," send a copy of the Hazard Assessment and Health & Safety Plan to the Liberty Radiation Safety Officer (RSO).

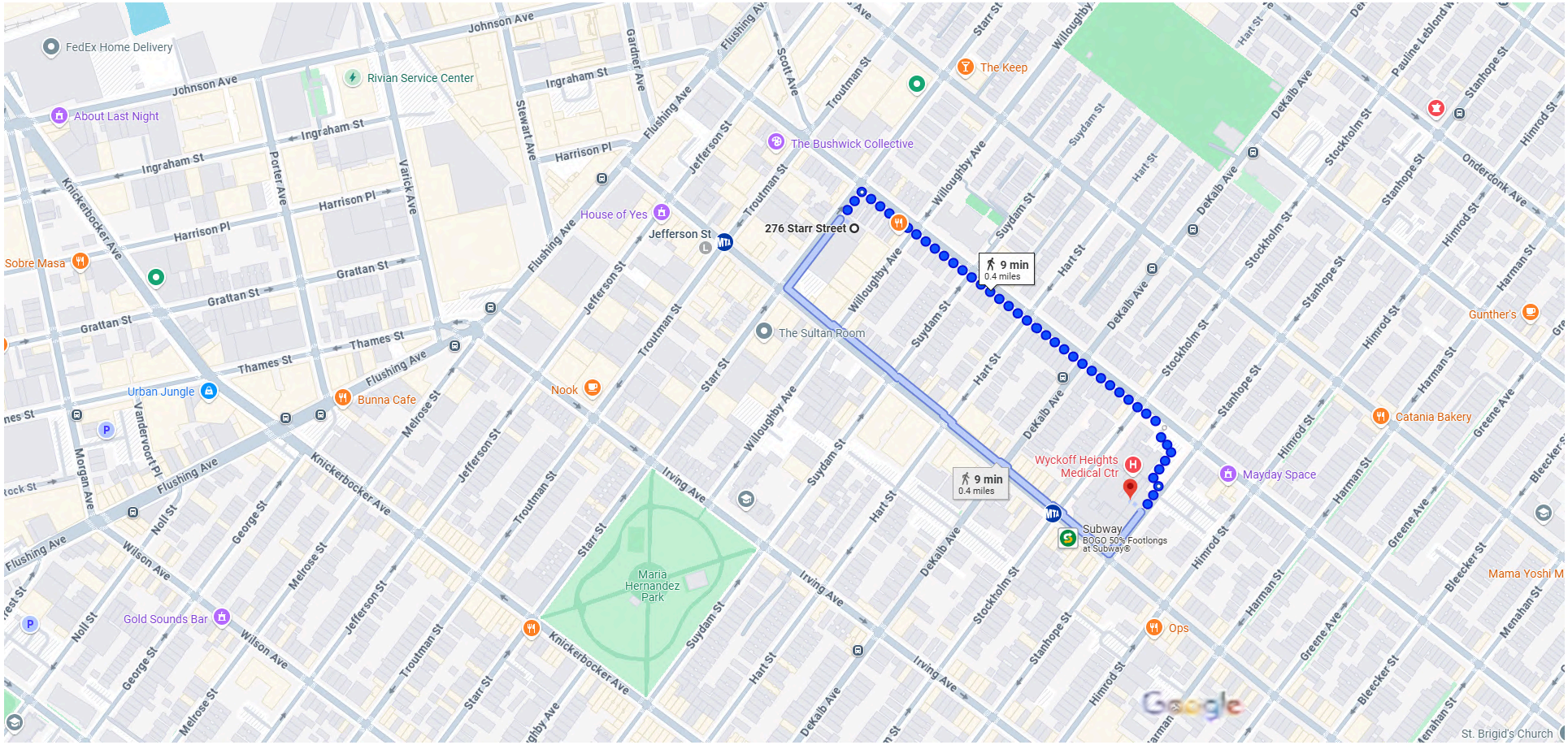
Physical Safety Hazards On-Site and Control Measures

HAZARD	CONTROL MEASURE
Heat Stress	Consume proper fluids and monitor for heat stress/exhaustion
Heavy Equipment	Stay out of way of heavy equipment
Confined Space	Confined space entry protocols and training per 29 CFR 1910.146 must be followed.
Utilities	Clear utilities prior to drilling.
Noise	Wear hearing protection if noise levels exceed 85 db.
Organic Vapor Exposure	Monitor per Plan. Maintain Exclusion Zone of 10 feet from boreholes or beyond where ambient air is 10ppm or less for 1 hour period
Dust	Control dust from drilling by directing driller to add water as needed

Google Maps

276 Starr Street, Brooklyn, NY to 346 Stanhope St, Brooklyn, NY 11237

Walk 0.4 mile, 9 min



Map data ©2025 Google 200 ft

via St Nicholas Ave	9 min	0.4 mile
via Wyckoff Ave	9 min	0.4 mile

APPENDIX C:
Community Air Monitoring Plan (CAMP)

Liberty Environmental

600 Third Avenue, Second Floor, New York, NY 10016 800-305-6019 www.libertyenviro.com

Appendix C

New York State Department of Health
Community Air Monitoring Plan
Churches United For Fair Housing Offices
276-284 Starr Street, Borough of Brooklyn, NY

A Community Air Monitoring Plan (CAMP) requires 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 CAMP presented below includes the primary elements of the generic CAMP presented in of NYSDEC document DER-10 Appendix 1A; however, the CAMP has been modified to account for the limited scope and duration of the intrusive investigative and remedial activities. The investigative and remedial work activities will primarily occur inside the Site building with limited activities to be performed outdoors (installation of two monitoring wells and manual movement of hand excavated concrete and soil to a roll-off container). Therefore, special requirements have been included in the CAMP for limited duration outdoor work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. Reliance on this 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

Based upon available information regarding known and likely contaminants at the Site, air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary.

Periodic monitoring will be required for all ground intrusive activities and non-intrusive activities. Ground intrusive activities include, but are not limited to, sawing and removal of floor slabs, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells. Non-intrusive activities include, but are not limited to, the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during non-intrusive sample collection activities will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a periodic basis with a frequency of at least one measurement per hour. Upwind concentrations will be measured at the start of each workday and at the same frequency as downwind measurements to establish and document background conditions. Given the short duration of both the intrusive and non-intrusive activities, the VOC monitoring will be limited to instantaneous readings, to be performed using a handheld MiniRAE 3000 photoionization detector (PID) equipped with an 11.7 ev lamp. The PID will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate (isobutylene). The PID concentrations 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, 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 emissions and/or 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.

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

4. All readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored periodically at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. Upwind and downwind particulate concentrations will be measured at the start of each workday and at a frequency of at least once per hour thereafter. The particulate monitoring will be performed using a handheld TSI Aurotrack 9306V which is capable of measuring particulate matter less than 10 micrometers in size (PM-10). The particulate monitoring unit is equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

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

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

When work areas are within 20 feet of potentially exposed populations or occupied structures, the monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices will be considered to prevent exposures related to the work activities

and to control dust and odors. Consideration will be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

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

2. If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities will be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

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

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

APPENDIX D:
Historical Laboratory Reports

ANALYTICAL REPORT

July 11, 2022

BBG - San Diego, CA

Sample Delivery Group:	L1512623
Samples Received:	07/07/2022
Project Number:	0522008490
Description:	280-284 Starr Street Brooklyn, NY

Report To:

Matt Smelski
11440 W. Bernardo Court
Suite 104
San Diego, CA 92127

Entire Report Reviewed By:

Heather J Wagner
Project Manager

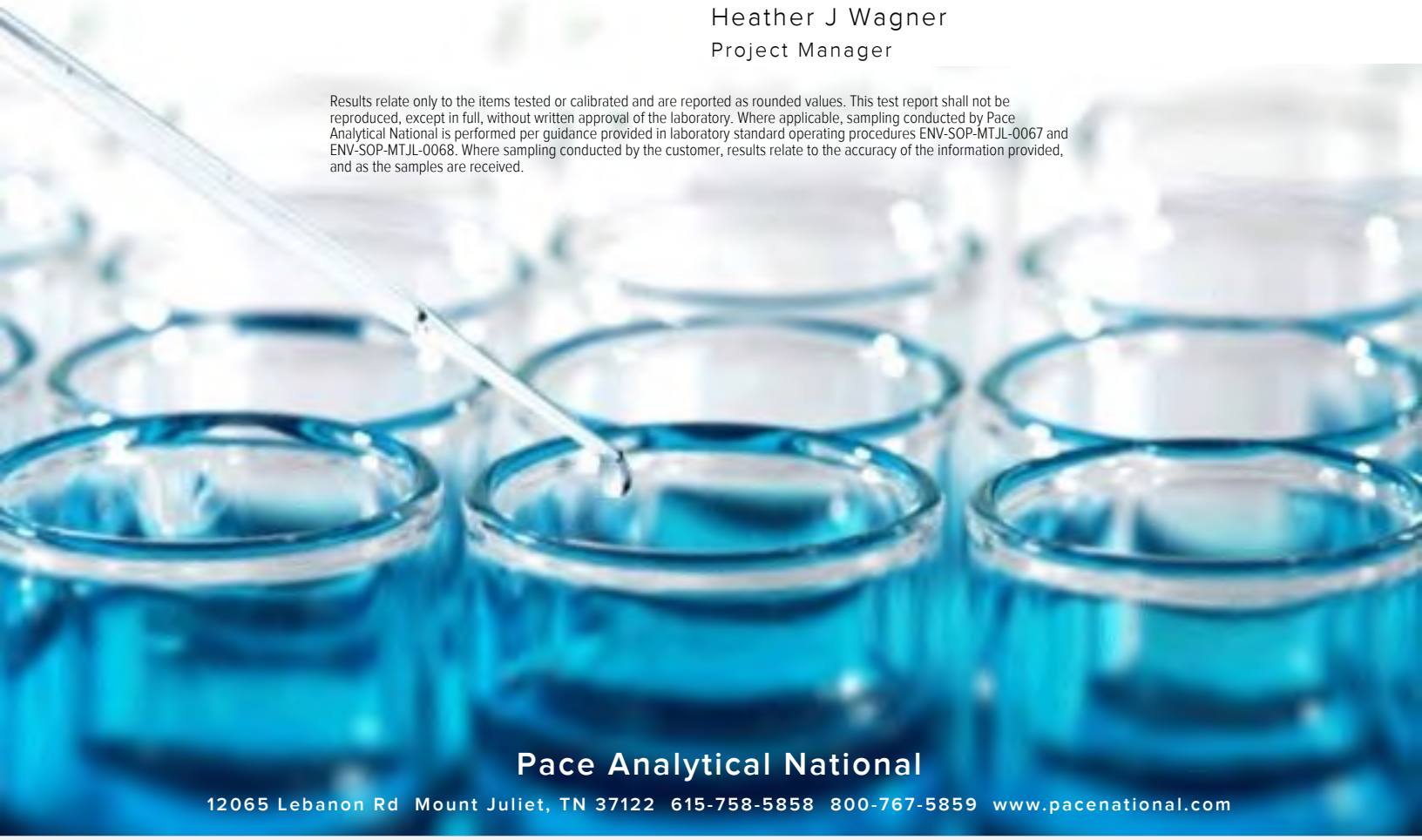


TABLE OF CONTENTS

SV1 L1512623-01 Air

Collected by: Frank G | Collected date/time: 07/06/22 10:05 | Received date/time: 07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 15:10	07/08/22 15:10	DAH	Mt. Juliet, TN

SV2 L1512623-02 Air

Collected by: Frank G | Collected date/time: 07/06/22 10:16 | Received date/time: 07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 15:48	07/08/22 15:48	DAH	Mt. Juliet, TN

SV3 L1512623-03 Air

Collected by: Frank G | Collected date/time: 07/06/22 10:31 | Received date/time: 07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 16:25	07/08/22 16:25	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1892371	50	07/09/22 20:15	07/09/22 20:15	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1893092	400	07/11/22 15:30	07/11/22 15:30	MBF	Mt. Juliet, TN

SV4 L1512623-04 Air

Collected by: Frank G | Collected date/time: 07/06/22 10:40 | Received date/time: 07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 17:03	07/08/22 17:03	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1892371	50	07/09/22 20:53	07/09/22 20:53	FKG	Mt. Juliet, TN

IA1 L1512623-05 Air

Collected by: Frank G | Collected date/time: 07/06/22 16:17 | Received date/time: 07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	2	07/08/22 22:10	07/08/22 22:10	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1892371	5	07/09/22 22:50	07/09/22 22:50	FKG	Mt. Juliet, TN

IA2 L1512623-06 Air

Collected by: Frank G | Collected date/time: 07/06/22 16:18 | Received date/time: 07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 17:41	07/08/22 17:41	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1892371	1	07/09/22 18:19	07/09/22 18:19	FKG	Mt. Juliet, TN

IA3 L1512623-07 Air

Collected by: Frank G | Collected date/time: 07/06/22 16:22 | Received date/time: 07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 18:20	07/08/22 18:20	DAH	Mt. Juliet, TN

IA4 L1512623-08 Air

Collected by	Collected date/time	Received date/time
Frank G	07/06/22 16:24	07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 18:58	07/08/22 18:58	DAH	Mt. Juliet, TN

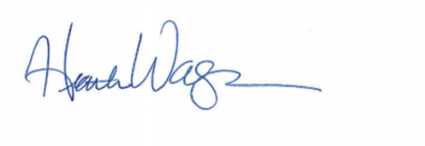
OA1 L1512623-09 Air

Collected by	Collected date/time	Received date/time
Frank G	07/06/22 16:31	07/07/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1891869	1	07/08/22 19:36	07/08/22 19:36	DAH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Heather J Wagner
Project Manager

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	4.39	14.0		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1891869
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.314	1.09	B	1	WG1891869
Tetrachloroethylene	127-18-4	166	0.200	1.36	3.37	22.9		1	WG1891869
Toluene	108-88-3	92.10	0.500	1.88	1.01	3.80		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	7.30	39.7		1	WG1891869
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1891869
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*101*				WG1891869

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	0.375	1.20		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.205	1.29		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1891869
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.343	1.19	B	1	WG1891869
Tetrachloroethylene	127-18-4	166	0.200	1.36	2.91	19.8		1	WG1891869
Toluene	108-88-3	92.10	0.500	1.88	ND	ND		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	8.81	47.9		1	WG1891869
Trichloroethylene	79-01-6	131	0.200	1.07	15.6	83.6		1	WG1891869
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.8*				WG1891869

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	1.78	5.69		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.729	4.59		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	10.0	39.6	116	460		50	WG1892371
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND		1	WG1891869
Tetrachloroethylene	127-18-4	166	10.0	67.9	174	1180		50	WG1892371
Toluene	108-88-3	92.10	0.500	1.88	1.44	5.42		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	3.59	19.5		1	WG1891869
Trichloroethylene	79-01-6	131	80.0	429	9020	48300		400	WG1893092
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*96.3*				WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*96.5*				WG1892371
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*94.3*				WG1893092

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	1.18	3.77		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.313	1.97		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	60.3	239		1	WG1891869
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.429	1.49	B	1	WG1891869
Tetrachloroethylene	127-18-4	166	0.200	1.36	58.9	400		1	WG1891869
Toluene	108-88-3	92.10	0.500	1.88	1.24	4.67		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	1.29	7.02		1	WG1891869
Trichloroethylene	79-01-6	131	10.0	53.6	2470	13200		50	WG1892371
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*97.5*				WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*96.2*				WG1892371

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	1.00	3.19	ND	ND		5	WG1892371
Carbon tetrachloride	56-23-5	154	0.400	2.52	ND	ND		2	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.400	1.59	ND	ND		2	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.400	1.59	ND	ND		2	WG1891869
Ethylbenzene	100-41-4	106	1.00	4.34	ND	ND		5	WG1892371
Methylene Chloride	75-09-2	84.90	0.400	1.39	1.44	5.00	B	2	WG1891869
Tetrachloroethylene	127-18-4	166	1.00	6.79	ND	ND		5	WG1892371
Toluene	108-88-3	92.10	2.50	9.42	4.68	17.6		5	WG1892371
1,1,1-Trichloroethane	71-55-6	133	0.400	2.18	ND	ND		2	WG1891869
Trichloroethylene	79-01-6	131	1.00	5.36	ND	ND		5	WG1892371
Vinyl chloride	75-01-4	62.50	0.400	1.02	ND	ND		2	WG1891869
m&p-Xylene	1330-20-7	106	2.00	8.67	ND	ND		5	WG1892371
o-Xylene	95-47-6	106	1.00	4.34	ND	ND		5	WG1892371
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*105*				WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*96.1*				WG1892371

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	0.403	1.29		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1891869
Ethylbenzene	100-41-4	106	0.200	0.867	0.486	2.11		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.602	2.09	B	1	WG1891869
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.253	1.72		1	WG1891869
Toluene	108-88-3	92.10	0.500	1.88	5.59	21.1		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.323	1.76		1	WG1891869
Trichloroethylene	79-01-6	131	0.200	1.07	1.47	7.88		1	WG1892371
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	1.52	6.59		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	0.567	2.46		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*101*				WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*97.7*				WG1892371

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	0.344	1.10		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1891869
Ethylbenzene	100-41-4	106	0.200	0.867	0.695	3.01		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.799	2.77	B	1	WG1891869
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.444	3.01		1	WG1891869
Toluene	108-88-3	92.10	0.500	1.88	20.6	77.6		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.568	3.09		1	WG1891869
Trichloroethylene	79-01-6	131	0.200	1.07	15.2	81.4		1	WG1891869
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	1.90	8.24		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	0.688	2.98		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*99.7*				WG1891869

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	0.359	1.15		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1891869
Ethylbenzene	100-41-4	106	0.200	0.867	0.649	2.81		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.971	3.37	B	1	WG1891869
Tetrachloroethylene	127-18-4	166	0.200	1.36	0.466	3.16		1	WG1891869
Toluene	108-88-3	92.10	0.500	1.88	19.1	71.9		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.540	2.94		1	WG1891869
Trichloroethylene	79-01-6	131	0.200	1.07	14.3	76.6		1	WG1891869
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	1.81	7.85		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	0.658	2.85		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*100*				WG1891869

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	0.238	0.760		1	WG1891869
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1891869
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1891869
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1891869
Ethylbenzene	100-41-4	106	0.200	0.867	0.393	1.70		1	WG1891869
Methylene Chloride	75-09-2	84.90	0.200	0.694	0.546	1.90	B	1	WG1891869
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND		1	WG1891869
Toluene	108-88-3	92.10	0.500	1.88	1.90	7.16		1	WG1891869
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1891869
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1891869
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1891869
m&p-Xylene	1330-20-7	106	0.400	1.73	0.929	4.03		1	WG1891869
o-Xylene	95-47-6	106	0.200	0.867	0.331	1.44		1	WG1891869
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*101*				WG1891869

QUALITY CONTROL SUMMARY

L1512623-01,02,03,04,05,06,07,08,09

Method Blank (MB)

(MB) R3812521-2 07/08/22 08:47

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Benzene	U		0.0715	0.200
Carbon tetrachloride	U		0.0732	0.200
1,1-Dichloroethene	U		0.0762	0.200
cis-1,2-Dichloroethene	U		0.0784	0.200
Ethylbenzene	U		0.0835	0.200
Methylene Chloride	0.136	J	0.0979	0.200
Tetrachloroethylene	U		0.0814	0.200
Toluene	U		0.0870	0.500
1,1,1-Trichloroethane	U		0.0736	0.200
Trichloroethylene	U		0.0680	0.200
Vinyl chloride	U		0.0949	0.200
m&p-Xylene	U		0.135	0.400
o-Xylene	U		0.0828	0.200
(S) 1,4-Bromofluorobenzene	*96.4*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3812521-1 07/08/22 08:10 • (LCSD) R3812521-3 07/08/22 09:52

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	3.75	4.21	3.99	112	106	70.0-130			5.37	25
Carbon tetrachloride	3.75	4.10	3.96	109	106	70.0-130			3.47	25
1,1-Dichloroethene	3.75	4.03	3.81	107	102	70.0-130			5.61	25
cis-1,2-Dichloroethene	3.75	3.91	3.78	104	101	70.0-130			3.38	25
Ethylbenzene	3.75	4.16	3.97	111	106	70.0-130			4.67	25
Methylene Chloride	3.75	3.53	3.36	94.1	89.6	70.0-130			4.93	25
Tetrachloroethylene	3.75	4.41	4.26	118	114	70.0-130			3.46	25
Toluene	3.75	4.18	4.05	111	108	70.0-130			3.16	25
1,1,1-Trichloroethane	3.75	4.03	3.88	107	103	70.0-130			3.79	25
Trichloroethylene	3.75	4.22	4.11	113	110	70.0-130			2.64	25
Vinyl chloride	3.75	4.00	3.82	107	102	70.0-130			4.60	25
m&p-Xylene	7.50	8.33	8.02	111	107	70.0-130			3.79	25
o-Xylene	3.75	4.10	3.95	109	105	70.0-130			3.73	25
(S) 1,4-Bromofluorobenzene				*98.5*	*97.9*	*60.0-140*				

Method Blank (MB)

(MB) R3812884-3 07/09/22 06:16

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Benzene	U		0.0715	0.200
cis-1,2-Dichloroethene	U		0.0784	0.200
Ethylbenzene	U		0.0835	0.200
Tetrachloroethylene	U		0.0814	0.200
Toluene	U		0.0870	0.500
Trichloroethylene	U		0.0680	0.200
m&p-Xylene	U		0.135	0.400
o-Xylene	U		0.0828	0.200
(S) 1,4-Bromofluorobenzene	*93.6*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3812884-1 07/09/22 04:55 • (LCSD) R3812884-2 07/09/22 05:36

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	3.75	4.67	4.73	125	126	70.0-130			1.28	25
cis-1,2-Dichloroethene	3.75	4.65	4.69	124	125	70.0-130			0.857	25
Ethylbenzene	3.75	4.70	4.74	125	126	70.0-130			0.847	25
Tetrachloroethylene	3.75	4.50	4.55	120	121	70.0-130			1.10	25
Toluene	3.75	4.61	4.65	123	124	70.0-130			0.864	25
Trichloroethylene	3.75	4.47	4.58	119	122	70.0-130			2.43	25
m&p-Xylene	7.50	9.45	9.51	126	127	70.0-130			0.633	25
o-Xylene	3.75	4.58	4.66	122	124	70.0-130			1.73	25
(S) 1,4-Bromofluorobenzene				*97.9*	*97.6*	*60.0-140*				

Method Blank (MB)

(MB) R3813319-3 07/11/22 10:39

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Trichloroethylene	U		0.0680	0.200
(S) 1,4-Bromofluorobenzene	*95.0*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3813319-1 07/11/22 09:19 • (LCSD) R3813319-2 07/11/22 10:00

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Trichloroethylene	3.75	4.59	4.59	122	122	70.0-130			0.000	25
(S) 1,4-Bromofluorobenzene				*96.2*	*97.2*	*60.0-140*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
BBG - San Diego, CA

11440 W. Bernardo Court

Suite 104

Billing Information:
BBG Accounts Payable
11440 W. Bernardo Court

Suite 104
San Diego, CA 92127

Report To:
Matt Smelski

Email To:
msmelski@bbgres.com

Project Description: 280-284 Starr Street Brooklyn, NY

City/State Collected: BROOKLYN, NY

Please Circle: PT MT CT ET

Phone: 559-441-3227

Client Project # 0522008490

Lab Project # BBGSDCA-280-284 STAR

Collected by (print): FRANK GALDUN

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Three Day
___ Next Day ___ Five Day
(Two Day)

Date Results Needed

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE
MT JULIET, TN
12065 Lebanon Road Mt Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L512623

J054

Acctnum: BBGSDCA
Template: T211713
Prelogin: P933516
PM: 873 - Heather J Wagner
PB: 6/6 6/7/22

Shipped Via: FedEX Ground

Sample ID	Can #	Flow Cont. #	Collection Date	Collection Time	Canister Pressure/Vacuum Initial	Canister Pressure/Vacuum Final	Analysis: TO-15 Summa	Rem./Contaminant	Sample # (lab only)
SV1	011996	008401	6/6/22	0905 / 1005	29.5	0	X		-01
SV2	021149	012366	6/6/22	0916 / 1016	29	7	X		-02
SV3	006909	005872	6/6/22	0931 / 1031	29	4	X		-03
SV4	012358	012350	6/6/22	0940 / 1040	28.5	8	X		-04
IA1	008762	009394	7/6/22	0817 / 4:17	29.5	16	X		-05
IA2	011239	020159	7/6/22	0818 / 4:18	29.5	4.5	X		-06
IA3	020413	021517	7/6/22	0822 / 4:22	OVER 30	4	X		-07
IA4	007226	007510	7/6/22	0824 / 4:24	29	1.5	X		-08
OA1	012551	006363	7/6/22	8:31 / 4:31	OVER 30	9	X		-09

Remarks: REPORT ONLY: PCE, TCE, CIS-1,2-DCE, 1,1-DCE, 1,1,1-TCA, CARBON TET., METHYLENE CHLORIDE, VINYL CHLONDE, BTEX
NOTE: IA1 REGULATOR EXTREMELY SLOW DRAW.

Samples returned via: __ UPS __ FedEx __ Courier __ _____

Tracking #

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	6/6/22	7:20PM			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 7-7	Time: 9:00

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

NCF:

Technical Report

prepared for:

Liberty Environmental, Inc
600 3rd Avenue, 2nd Floor
New York NY, 10016
Attention: Andre Matthews

Report Date: 04/22/2024
Client Project ID: 280-284 Starr Street
York Project (SDG) No.: 24D1066

Stratford, CT Laboratory IDs:
NY:10854, NJ: CT005, PA: 68-0440, CT: PH-0723

Richmond Hill, NY Laboratory IDs:
NY:12058, NJ: NY037, CT: PH-0721, NH: 2097,
EPA: NY01600

120 RESEARCH DRIVE STRATFORD, CT 06615 ■ 132-02 89th AVENUE RICHMOND HILL, NY 11418
www.YORKLAB.com (203) 325-1371 FAX (203) 357-0166 ClientServices@yorklab.com

Report Date: 04/22/2024
Client Project ID: 280-284 Starr Street
York Project (SDG) No.: 24D1066

Liberty Environmental, Inc
600 3rd Avenue, 2nd Floor
New York NY, 10016
Attention: Andre Matthews

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on April 17, 2024 and listed below. The project was identified as your project: **280-284 Starr Street**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
24D1066-01	IA-1	Indoor Ambient Air	04/16/2024	04/17/2024
24D1066-02	IA-2	Indoor Ambient Air	04/16/2024	04/17/2024
24D1066-03	IA-3	Indoor Ambient Air	04/16/2024	04/17/2024

General Notes for York Project (SDG) No.: 24D1066

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854, NJ Cert No. CT005, PA Cert No. 68-04440, CT Cert No. PH-0723; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058, NJ Cert No. NY037, CT Cert No. PH-0721, NH Cert No. 2097, EPA Cert No. NY01600.

Approved By: Cassie L. Mosher

Cassie L. Mosher
Laboratory Manager

Date: 04/22/2024

Sample Information

Client Sample ID: **IA-1** **York Sample ID:** **24D1066-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 8:55 am	04/17/2024

VOA, TO15 Isooctane (2,2,4-TMP) Add On

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
540-84-1	* 2,2,4-Trimethylpentane	ND		ppbv	0.0392	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR

Volatile Organics, EPA TO15 Full List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	* 1,1,1,2-Tetrachloroethane	ND		ug/m³	0.54	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR
71-55-6	1,1,1-Trichloroethane	ND		ug/m³	0.43	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/m³	0.54	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/m³	0.60	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
79-00-5	1,1,2-Trichloroethane	ND		ug/m³	0.43	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
75-34-3	1,1-Dichloroethane	ND		ug/m³	0.32	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
75-35-4	1,1-Dichloroethylene	ND		ug/m³	0.078	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
120-82-1	1,2,4-Trichlorobenzene	ND	TO-CCV, TO-LCS-L	ug/m³	0.58	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
95-63-6	**1,2,4-Trimethylbenzene**	**0.81**		ug/m³	0.39	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
106-93-4	1,2-Dibromoethane	ND		ug/m³	0.60	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
95-50-1	1,2-Dichlorobenzene	ND		ug/m³	0.47	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
107-06-2	1,2-Dichloroethane	ND		ug/m³	0.32	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
78-87-5	1,2-Dichloropropane	ND		ug/m³	0.36	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
76-14-2	1,2-Dichlorotetrafluoroethane	ND		ug/m³	0.55	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
108-67-8	1,3,5-Trimethylbenzene	ND		ug/m³	0.39	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR

Sample Information

Client Sample ID: **IA-1** **York Sample ID:** **24D1066-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 8:55 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
106-99-0	1,3-Butadiene	ND		ug/m³	0.52	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
541-73-1	1,3-Dichlorobenzene	ND		ug/m³	0.47	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
142-28-9	* 1,3-Dichloropropane	ND		ug/m³	0.36	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR
106-46-7	1,4-Dichlorobenzene	ND		ug/m³	0.47	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
123-91-1	1,4-Dioxane	ND		ug/m³	0.56	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
78-93-3	**2-Butanone**	**2.1**		ug/m³	0.23	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
591-78-6	* 2-Hexanone	ND		ug/m³	0.64	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR
107-05-1	3-Chloropropene	ND		ug/m³	1.2	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
108-10-1	4-Methyl-2-pentanone	ND		ug/m³	0.32	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
67-64-1	**Acetone**	**26**		ug/m³	1.4	2.942	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/22/2024 16:23	YR
107-13-1	**Acrylonitrile**	**0.41**		ug/m³	0.17	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
71-43-2	**Benzene**	**0.70**		ug/m³	0.25	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
100-44-7	Benzyl chloride	ND	TO-CCV	ug/m³	0.41	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
75-27-4	Bromodichloromethane	ND		ug/m³	0.53	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
75-25-2	Bromoform	ND		ug/m³	0.81	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
74-83-9	Bromomethane	ND		ug/m³	0.30	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
75-15-0	Carbon disulfide	ND		ug/m³	0.24	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
56-23-5	**Carbon tetrachloride**	**0.44**		ug/m³	0.12	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR
108-90-7	Chlorobenzene	ND		ug/m³	0.36	0.784	EPA TO-15 Certifications:	04/19/2024 12:00 NELAC-NY12058,NJDEP-NY037	04/19/2024 23:31	YR

Sample Information

Client Sample ID: **IA-1** **York Sample ID:** **24D1066-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 8:55 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-00-3	Chloroethane	ND		ug/m³	0.21	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
67-66-3	**Chloroform**	**0.42**		ug/m³	0.38	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
74-87-3	**Chloromethane**	**1.4**		ug/m³	0.16	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
156-59-2	cis-1,2-Dichloroethylene	ND		ug/m³	0.078	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/m³	0.36	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
110-82-7	**Cyclohexane**	**25**		ug/m³	0.27	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
124-48-1	Dibromochloromethane	ND		ug/m³	0.67	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
75-71-8	**Dichlorodifluoromethane**	**2.6**		ug/m³	0.39	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
141-78-6	*** Ethyl acetate**	**2.1**		ug/m³	0.56	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR
100-41-4	**Ethyl Benzene**	**0.99**		ug/m³	0.34	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
87-68-3	Hexachlorobutadiene	ND		ug/m³	0.84	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
67-63-0	**Isopropanol**	**200**	B	ug/m³	3.6	2.942	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/22/2024 16:23	YR
80-62-6	Methyl Methacrylate	ND		ug/m³	0.32	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/m³	0.28	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
75-09-2	**Methylene chloride**	**0.76**		ug/m³	0.54	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
91-20-3	* Naphthalene	ND	TO-CCV	ug/m³	0.82	0.784	EPA TO-15 Certifications: NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
142-82-5	**n-Heptane**	**2.4**		ug/m³	0.32	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
110-54-3	**n-Hexane**	**1.5**		ug/m³	0.28	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
95-47-6	**o-Xylene**	**1.6**		ug/m³	0.34	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
179601-23-1	**p- & m- Xylenes**	**3.8**		ug/m³	0.68	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR

Sample Information

Client Sample ID: IA-1 **York Sample ID:** 24D1066-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 8:55 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
622-96-8	*** p-Ethyltoluene**	**0.66**		ug/m³	0.39	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR
115-07-1	*** Propylene**	**2.1**		ug/m³	0.13	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR
100-42-5	**Styrene**	**0.33**		ug/m³	0.33	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
127-18-4	**Tetrachloroethylene**	**0.53**		ug/m³	0.53	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
109-99-9	* Tetrahydrofuran	ND		ug/m³	0.46	0.784	EPA TO-15 Certifications:	04/19/2024 12:00	04/19/2024 23:31	YR
108-88-3	**Toluene**	**32**		ug/m³	0.30	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
156-60-5	trans-1,2-Dichloroethylene	ND		ug/m³	0.31	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/m³	0.36	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
79-01-6	**Trichloroethylene**	**2.3**		ug/m³	0.11	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
75-69-4	**Trichlorofluoromethane (Freon 11)**	**1.4**		ug/m³	0.44	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
108-05-4	Vinyl acetate	ND		ug/m³	0.28	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
593-60-2	Vinyl bromide	ND		ug/m³	0.34	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR
75-01-4	Vinyl Chloride	ND		ug/m³	0.10	0.784	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/19/2024 23:31	YR

Sample Information

Client Sample ID: IA-2 **York Sample ID:** 24D1066-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:00 am	04/17/2024

VOA, TO15 Isooctane (2,2,4-TMP) Add On

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
540-84-1	* 2,2,4-Trimethylpentane	ND		ppbv	0.0438	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR

Sample Information

Client Sample ID: **IA-2** **York Sample ID:** **24D1066-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:00 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	* 1,1,1,2-Tetrachloroethane	ND		ug/m³	0.60	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR
71-55-6	1,1,1-Trichloroethane	ND		ug/m³	0.48	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/m³	0.60	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/m³	0.67	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
79-00-5	1,1,2-Trichloroethane	ND		ug/m³	0.48	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-34-3	1,1-Dichloroethane	ND		ug/m³	0.35	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-35-4	1,1-Dichloroethylene	ND		ug/m³	0.087	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
120-82-1	1,2,4-Trichlorobenzene	ND	TO-CCV, TO-LCS-L	ug/m³	0.65	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
95-63-6	**1,2,4-Trimethylbenzene**	**0.95**		ug/m³	0.43	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
106-93-4	1,2-Dibromoethane	ND		ug/m³	0.67	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
95-50-1	1,2-Dichlorobenzene	ND		ug/m³	0.53	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
107-06-2	1,2-Dichloroethane	ND		ug/m³	0.35	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
78-87-5	1,2-Dichloropropane	ND		ug/m³	0.40	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
76-14-2	1,2-Dichlorotetrafluoroethane	ND		ug/m³	0.61	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
108-67-8	1,3,5-Trimethylbenzene	ND		ug/m³	0.43	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
106-99-0	1,3-Butadiene	ND		ug/m³	0.58	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
541-73-1	1,3-Dichlorobenzene	ND		ug/m³	0.53	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
142-28-9	* 1,3-Dichloropropane	ND		ug/m³	0.40	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR
106-46-7	1,4-Dichlorobenzene	ND		ug/m³	0.53	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR

Sample Information

Client Sample ID: **IA-2** **York Sample ID:** **24D1066-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:00 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
123-91-1	1,4-Dioxane	ND		ug/m³	0.63	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
78-93-3	**2-Butanone**	**5.0**		ug/m³	0.26	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
591-78-6	*** 2-Hexanone**	**2.1**		ug/m³	0.72	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR
107-05-1	3-Chloropropene	ND		ug/m³	1.4	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
108-10-1	4-Methyl-2-pentanone	ND		ug/m³	0.36	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
67-64-1	**Acetone**	**60**		ug/m³	0.42	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
107-13-1	**Acrylonitrile**	**0.21**		ug/m³	0.19	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
71-43-2	**Benzene**	**0.62**		ug/m³	0.28	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
100-44-7	Benzyl chloride	ND	TO-CCV	ug/m³	0.45	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-27-4	Bromodichloromethane	ND		ug/m³	0.59	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-25-2	Bromoform	ND		ug/m³	0.91	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
74-83-9	Bromomethane	ND		ug/m³	0.34	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-15-0	Carbon disulfide	ND		ug/m³	0.27	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
56-23-5	**Carbon tetrachloride**	**0.50**		ug/m³	0.14	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
108-90-7	Chlorobenzene	ND		ug/m³	0.40	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-00-3	Chloroethane	ND		ug/m³	0.23	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
67-66-3	**Chloroform**	**4.2**		ug/m³	0.43	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
74-87-3	**Chloromethane**	**1.2**		ug/m³	0.18	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
156-59-2	**cis-1,2-Dichloroethylene**	**0.42**		ug/m³	0.087	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/m³	0.40	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR

Sample Information

Client Sample ID: **IA-2** **York Sample ID:** **24D1066-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:00 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
110-82-7	**Cyclohexane**	**48**		ug/m³	0.30	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
124-48-1	Dibromochloromethane	ND		ug/m³	0.75	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-71-8	**Dichlorodifluoromethane**	**3.2**		ug/m³	0.43	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
141-78-6	*** Ethyl acetate**	**1.3**		ug/m³	0.63	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR
100-41-4	**Ethyl Benzene**	**1.4**		ug/m³	0.38	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
87-68-3	Hexachlorobutadiene	ND		ug/m³	0.93	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
67-63-0	**Isopropanol**	**4.5**	B	ug/m³	1.1	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
80-62-6	**Methyl Methacrylate**	**0.68**		ug/m³	0.36	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/m³	0.32	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
75-09-2	**Methylene chloride**	**0.76**		ug/m³	0.61	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
91-20-3	* Naphthalene	ND	TO-CCV	ug/m³	0.92	0.876	EPA TO-15 Certifications: NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
142-82-5	**n-Heptane**	**4.2**		ug/m³	0.36	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
110-54-3	**n-Hexane**	**2.3**		ug/m³	0.31	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
95-47-6	**o-Xylene**	**1.7**		ug/m³	0.38	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
179601-23-1	**p- & m- Xylenes**	**5.2**		ug/m³	0.76	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
622-96-8	*** p-Ethyltoluene**	**0.65**		ug/m³	0.43	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR
115-07-1	*** Propylene**	**4.2**		ug/m³	0.15	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR
100-42-5	**Styrene**	**0.52**		ug/m³	0.37	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
127-18-4	**Tetrachloroethylene**	**1.7**		ug/m³	0.59	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR
109-99-9	* Tetrahydrofuran	ND		ug/m³	0.52	0.876	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 00:17	YR
108-88-3	**Toluene**	**59**		ug/m³	0.33	0.876	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 00:17	YR

Sample Information

Client Sample ID: IA-2 **York Sample ID:** 24D1066-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:00 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
156-60-5	**trans-1,2-Dichloroethylene**	**0.35**		ug/m³	0.35	0.876	EPA TO-15	04/19/2024 12:00	04/20/2024 00:17	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/m³	0.40	0.876	EPA TO-15	04/19/2024 12:00	04/20/2024 00:17	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
79-01-6	**Trichloroethylene**	**34**		ug/m³	0.12	0.876	EPA TO-15	04/19/2024 12:00	04/20/2024 00:17	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
75-69-4	**Trichlorofluoromethane (Freon 11)**	**1.5**		ug/m³	0.49	0.876	EPA TO-15	04/19/2024 12:00	04/20/2024 00:17	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
108-05-4	Vinyl acetate	ND		ug/m³	0.31	0.876	EPA TO-15	04/19/2024 12:00	04/20/2024 00:17	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
593-60-2	Vinyl bromide	ND		ug/m³	0.38	0.876	EPA TO-15	04/19/2024 12:00	04/20/2024 00:17	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
75-01-4	Vinyl Chloride	ND		ug/m³	0.11	0.876	EPA TO-15	04/19/2024 12:00	04/20/2024 00:17	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		

Sample Information

Client Sample ID: IA-3 **York Sample ID:** 24D1066-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:05 am	04/17/2024

VOA, TO15 Isooctane (2,2,4-TMP) Add On

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
540-84-1	* 2,2,4-Trimethylpentane	ND		ppbv	0.0437	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:			

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	* 1,1,1,2-Tetrachloroethane	ND		ug/m³	0.60	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:			
71-55-6	1,1,1-Trichloroethane	ND		ug/m³	0.48	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/m³	0.60	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		

Sample Information

Client Sample ID: **IA-3** **York Sample ID:** **24D1066-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:05 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/m³	0.67	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
79-00-5	1,1,2-Trichloroethane	ND		ug/m³	0.48	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-34-3	1,1-Dichloroethane	ND		ug/m³	0.35	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-35-4	1,1-Dichloroethylene	ND		ug/m³	0.087	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
120-82-1	1,2,4-Trichlorobenzene	ND	TO-CCV, TO-LCS-L	ug/m³	0.65	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
95-63-6	**1,2,4-Trimethylbenzene**	**0.86**		ug/m³	0.43	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
106-93-4	1,2-Dibromoethane	ND		ug/m³	0.67	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
95-50-1	1,2-Dichlorobenzene	ND		ug/m³	0.53	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
107-06-2	1,2-Dichloroethane	ND		ug/m³	0.35	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
78-87-5	1,2-Dichloropropane	ND		ug/m³	0.40	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
76-14-2	1,2-Dichlorotetrafluoroethane	ND		ug/m³	0.61	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
108-67-8	1,3,5-Trimethylbenzene	ND		ug/m³	0.43	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
106-99-0	1,3-Butadiene	ND		ug/m³	0.58	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
541-73-1	1,3-Dichlorobenzene	ND		ug/m³	0.53	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
142-28-9	* 1,3-Dichloropropane	ND		ug/m³	0.40	0.874	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 01:02	YR
106-46-7	1,4-Dichlorobenzene	ND		ug/m³	0.53	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
123-91-1	1,4-Dioxane	ND		ug/m³	0.63	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
78-93-3	**2-Butanone**	**1.5**		ug/m³	0.26	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR

Sample Information

Client Sample ID: **IA-3** **York Sample ID:** **24D1066-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:05 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
591-78-6	* 2-Hexanone	ND		ug/m³	0.72	0.874	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 01:02	YR
107-05-1	3-Chloropropene	ND		ug/m³	1.4	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
108-10-1	4-Methyl-2-pentanone	ND		ug/m³	0.36	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
67-64-1	**Acetone**	**55**		ug/m³	0.42	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
107-13-1	Acrylonitrile	ND		ug/m³	0.19	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
71-43-2	**Benzene**	**0.70**		ug/m³	0.28	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
100-44-7	Benzyl chloride	ND	TO-CCV	ug/m³	0.45	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-27-4	Bromodichloromethane	ND		ug/m³	0.59	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-25-2	Bromoform	ND		ug/m³	0.90	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
74-83-9	Bromomethane	ND		ug/m³	0.34	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-15-0	Carbon disulfide	ND		ug/m³	0.27	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
56-23-5	**Carbon tetrachloride**	**0.49**		ug/m³	0.14	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
108-90-7	Chlorobenzene	ND		ug/m³	0.40	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-00-3	Chloroethane	ND		ug/m³	0.23	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
67-66-3	**Chloroform**	**0.47**		ug/m³	0.43	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
74-87-3	**Chloromethane**	**1.2**		ug/m³	0.18	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
156-59-2	cis-1,2-Dichloroethylene	ND		ug/m³	0.087	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/m³	0.40	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
110-82-7	**Cyclohexane**	**28**		ug/m³	0.30	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR

Sample Information

Client Sample ID: **IA-3** **York Sample ID:** **24D1066-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:05 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
124-48-1	Dibromochloromethane	ND		ug/m³	0.74	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-71-8	**Dichlorodifluoromethane**	**2.6**		ug/m³	0.43	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
141-78-6	*** Ethyl acetate**	**2.1**		ug/m³	0.63	0.874	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 01:02	YR
100-41-4	**Ethyl Benzene**	**0.76**		ug/m³	0.38	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
87-68-3	Hexachlorobutadiene	ND		ug/m³	0.93	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
67-63-0	**Isopropanol**	**7.4**	B	ug/m³	1.1	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
80-62-6	**Methyl Methacrylate**	**0.47**		ug/m³	0.36	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/m³	0.32	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
75-09-2	**Methylene chloride**	**0.79**		ug/m³	0.61	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
91-20-3	* Naphthalene	ND	TO-CCV	ug/m³	0.92	0.874	EPA TO-15 Certifications: NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
142-82-5	**n-Heptane**	**2.5**		ug/m³	0.36	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
110-54-3	**n-Hexane**	**1.7**		ug/m³	0.31	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
95-47-6	**o-Xylene**	**0.99**		ug/m³	0.38	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
179601-23-1	**p- & m- Xylenes**	**3.0**		ug/m³	0.76	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
622-96-8	*** p-Ethyltoluene**	**0.69**		ug/m³	0.43	0.874	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 01:02	YR
115-07-1	*** Propylene**	**2.0**		ug/m³	0.15	0.874	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 01:02	YR
100-42-5	Styrene	ND		ug/m³	0.37	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
127-18-4	Tetrachloroethylene	ND		ug/m³	0.59	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR
109-99-9	* Tetrahydrofuran	ND		ug/m³	0.52	0.874	EPA TO-15 Certifications:	04/19/2024 12:00	04/20/2024 01:02	YR
108-88-3	**Toluene**	**35**		ug/m³	0.33	0.874	EPA TO-15 Certifications: NELAC-NY12058,NJDEP-NY037	04/19/2024 12:00	04/20/2024 01:02	YR

Sample Information

Client Sample ID: **IA-3** **York Sample ID:** **24D1066-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
24D1066	280-284 Starr Street	Indoor Ambient Air	April 16, 2024 9:05 am	04/17/2024

Volatile Organics, EPA TO15 Full List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA TO15 PREP

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
156-60-5	trans-1,2-Dichloroethylene	ND		ug/m³	0.35	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/m³	0.40	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
79-01-6	**Trichloroethylene**	**2.4**		ug/m³	0.12	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
75-69-4	**Trichlorofluoromethane (Freon 11)**	**1.5**		ug/m³	0.49	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
108-05-4	Vinyl acetate	ND		ug/m³	0.31	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
593-60-2	Vinyl bromide	ND		ug/m³	0.38	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		
75-01-4	Vinyl Chloride	ND		ug/m³	0.11	0.874	EPA TO-15	04/19/2024 12:00	04/20/2024 01:02	YR
							Certifications:	NELAC-NY12058,NJDEP-NY037		

Sample and Data Qualifiers Relating to This Work Order

TO-LCS-L	The result reported for this compound may be biased low due to its behavior in the analysis batch LCS where it recovered less 70% of the expected value.
TO-CCV	The value reported is ESTIMATED for this compound due to its behavior during continuing calibration verification (>30% Difference from initial calibration).
B	Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants.

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon current NELAC/TNI Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

York Analytical Laboratories, Inc.
120 Research Drive, Stratford, CT 06615 | 132-02 89th Ave Queens, NY 11418
clientservices@yorklab.com
www.yorklab.com

Field Chain-of-Custody Record - AIR

NOTE: YORK's Standard Terms & Conditions are listed on the back side of this document. This document serves as your written authorization for YORK to proceed with the analyses requested below. Your signature binds you to YORK's Standard Terms & Conditions.

YORK Project No. 24D1060

YOUR Information	Report To:	Invoice To:
Company: Liberty Environmental	Company: Liberty Environmental	Company: Liberty Environmental
Address: 505 Penn Street Reading, PA	Address:	Address:
Phone:	Phone:	Phone:
Contact:	Contact:	Contact:
E-mail: Cherr@libertyenviro.com	E-mail:	E-mail:

YOUR Project Number:

YOUR Project Name: 280 - 284 Starr Street

YOUR PO#:

Turn-Around Time

- RUSH - Next Day
- RUSH - Two Day
- RUSH - Three Day
- RUSH - Four Day
- Standard (5-7 Day) ✓

Please print clearly and legibly. All information must be complete. Samples will not be logged in and the turn-around-time clock will not begin until any questions by YORK are resolved.

Andre Matthews
Samples Collected by: (print your name above and sign below)
AndreMatthews

Air Matrix Codes

- AI - Indoor Ambient Air
- AO - Outdoor Amb. Air
- AE - Vapor Extraction Well/ Process Gas/Effluent
- AS - Soil Vapor/Sub-Slab

Samples From

- New York ✓
- New Jersey
- Connecticut
- Pennsylvania
- Other

Report / EDD Type (circle selections)

Summary Report	CT RCP	Standard Excel EDD
QA Report	CT RCP DQA/DUE	EQuIS (Standard)
NY ASP A Package	NJDEP Reduced Deliv.	NYSDEC EQuIS
NY ASP B Package	NJDKQP	NJDEP SRP HazSite
Other:		

YORK Reg. Comp.

Compared to the following Regulation(s): (please fill in)

Certified Canisters: Batch ___ Individual ___

Please enter the following REQUIRED Field Data

Reporting Units: ug/m³ ___ ppbv ___ ppmv ___

Sample Identification	Date/Time Sampled	Air Matrix	Canister Vacuum Before Sampling (in Hg)	Canister Vacuum After Sampling (in Hg)	Canister ID	Flow Cont. ID	Analysis Requested
IA-2	4/16/24, 8:55 am	AI	-30	-4	34497	20423	Benzene, Carbon tetrachloride,
IA-2	4/16/24, 9:00 am	AI	-29	-8	10113	19391	1,1 Dichloroethene, cis-1,2
IA-3	4/16/24, 9:05 am	AI	-30	-6	10728	17987	Dichloroethene, Ethylbenzene,
							Methylene Chloride, Tetrachloroethylene,
							Toluene, 1,1,1-Trichloroethane,
							Trichloroethylene, Vinyl chloride,
							m&p-Xylene, o-Xylene

Comments:

Detection Limits Required

≤ 1 ug/m³ ___ NYSDEC V1 Limits ___
Routine Survey ___ Other ___

Sampling Media

- 6 Liter Canister ✓
- Tedlar Bag

Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time
Andre Matthews Liberty Environmental	4/16/24 8:27		4/17/24 8:27		1452
Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time
	4/17/24 1441		4/17/24 1441		
Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Received in LAB by	Date/Time
				(MS) 04/17/24	1452

04/17/24

APPENDIX E:

Example Field Sampling Forms

Liberty Environmental, Inc.

SOIL BORING LOG

Project #:	Project Name:	Driller:
Boring #:	Date:	Page of
Method: Geoprobe	Scientist:	Boring Location:

Depth (ft)	PID (ppm)	Recovery (ft)	Moisture	Sample I.D.	Description	USCS	Remarks
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

WELL CONSTRUCTION LOG

Project #:	Project Name:	Driller:
Boring #:	Date:	Page of
Method:	Geologist:	Boring Location:

Depth (ft)	PID (ppm)	Recovery (ft)	Blow Counts	Sample I.D.	Description	USCS	Remarks
							Depth-to-first-water-bearing-zone:
							Depth-to-bedrock:
							Depth-to-saturation:
							Borehole Diameter:
							Well Construction:
							Riser Type:
							From:
							To:
							Feet:
							Screen Type:
							From:
							To:
							Feet:
							Sand Pack Type:
							From:
							To:
							Bags:
							Bentonite Type:
							From:
							To:
							Bags:
							Grout Type:
							From:
							To:
							Bags:
							Concrete Type:
							From:
							To:
							Bags:

Liberty Environmental, Inc.

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

SHEET OF

PROJECT INFORMATION

SITE NAME: _____ LIBERTY PROJECT NO. _____

DATE: _____ FIELD PERSONNEL: _____

WEATHER: _____

WELL INFORMATION

MONITOR WELL ID: _____ WELL DEPTH (FT): _____ SCREENED INTERVAL: _____ PUMP INTAKE DEPTH (FT): _____

WELL DIAMETER (IN): _____ DEPTH TO PRODUCT (FT): _____ STATIC DEPTH TO WATER (FT)/TIME: _____ TYPE OF PUMP: _____

START PUMP TIME: _____ SAMPLE TIME: _____ GALLONS PURGED: _____ TUBING STATUS: _____

NOTES: _____

PURGING INFORMATION

TIME	Temp (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH (su)	ORP (mV)	Turbidity (NTUs)	Pumping Rate (mL/min)	Depth to Water (FT)

Note: Parameter stabilization occurs when three consecutive 3-5 min. readings are within: 0.1 for pH; 3% for conductivity and temperature, 10 Mv for ORP; 10% for DO>0.5 mg/L or 3 values<0.5 mg/L, 10% for turbidity>10 NTU or 3 values<10 NTU

Liberty Environmental, Inc.

SUB-SLAB VAPOR SAMPLING LOG

Date: _____ Client: _____ Project No. _____

Starting Temp.: _____ Site Location: _____ Field Person: _____

Ending Temp.: _____ Weather: _____ Baro Pressure: _____

Location Name	Location Description	SUMMA Canister ID	Flow Regulator ID

Location												
Times SKS was pumped prior to sampling/cc's extracted	strokes	cc's extracted	strokes	cc's extracted	strokes	cc's extracted	strokes	cc's extracted	strokes	cc's extracted	strokes	cc's extracted
	Time	**Pressure (-psi)**	**Time**	**Pressure (-psi)**	**Time**	**Pressure (-psi)**	**Time**	**Pressure (-psi)**	**Time**	**Pressure (-psi)**	**Time**	**Pressure (-psi)**
Shut in Test Start												
Shut in Test End												
Prior (Ambient)												
Test Start (0 min)												
min												
min												
min												
min												
min												
min												
min												
min												
min												
min												
min												
min												
Test End												
Test Duration												

Liberty Environmental, Inc.

INDOOR AIR SAMPLING LOG

Date: | Client: | Project No.

Starting Temp.: | Site Location: | Field Person:

Ending Temp.: | Weather: | Baro Pressure:

Location Name	Location Description	SUMMA Canister ID	Flow Regulator ID

Location												
	Time	Pressure (-psi)	Time	Pressure (-psi)	Time	Pressure (-psi)	Time	Pressure (-psi)	Time	Pressure (-psi)	Time	Pressure (-psi)
Prior (Ambient)												
Test Start (0 min)												
min												
min												
min												
min												
min												
min												
min												
min												
min												
min												
min												
min												
Test End												
Test Duration												

APPENDIX F:

Green and Sustainable Remediation Documentation

Environmental Footprint Summary

Core Element	Metric		Unit of Measure	Footprint						
				Soil Vapor Investigation	Soil Investigation	Groundwater Investigation	< Component 4 >	< Component 5 >	< Component 6 >	Total
Materials & Waste	M&W-1	Refined materials used on-site	Tons	0.0	0.0	0.5	0.0	0.0	0.0	0.5
	M&W-2	% of refined materials from recycled or reused material	%			0.0%				0.0%
	M&W-3	Unrefined materials used on-site	Tons	0.000	0.000	0.000	0.000	0.000	0.000	0.0
	M&W-4	% of unrefined materials from recycled or reused material	%							
	M&W-5	On-site hazardous waste disposed of off-site	Tons	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M&W-6	On-site non-hazardous waste disposed of off-site	Tons	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M&W-7	Recycled or reused waste	Tons	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M&W-8	% of total potential waste recycled or reused	%							
Water (used on-site)	W-1	Public water use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-2	Groundwater use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-3	Surface water use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-4	Reclaimed water use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-5	Storm water use	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-6	User-defined water resource #1	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-7	User-defined water resource #2	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	W-8	Wastewater generated	MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy	E-1	Total energy used (on-site and off-site)	MMBtu	0.3	3.6	6.5	0.0	0.0	0.0	10.3
	E-2	Energy voluntarily derived from renewable resources								
	E-2A	On-site renewable energy generation or use + on-site biodiesel use + biodiesel and other renewable resource use for transportation	MMBtu	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E-2B	Voluntary purchase of renewable electricity	MWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E-3	Voluntary purchase of RECs	MWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E-4	On-site grid electricity use	MWh	0.000	0.000	0.000	0.000	0.000	0.000	0.0
Air	A-1	On-site NOx, SOx, and PM emissions	Pounds	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	A-2	On-site HAP emissions	Pounds	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	A-3	Total NOx, SOx, and PM emissions	Pounds	0.1	11.4	8.8	0.0	0.0	0.0	20.3
	A-3A	Total NOx emissions	Pounds	0.1	4.5	6.7	0.0	0.0	0.0	11.2
	A-3B	Total SOx emissions	Pounds	0.0	6.0	1.8	0.0	0.0	0.0	7.8
	A-3C	Total PM emissions	Pounds	0.0	0.9	0.4	0.0	0.0	0.0	1.3
	A-4	Total HAP emissions	Pounds	0.0	0.6	0.2	0.0	0.0	0.0	0.9
	A-5	Total greenhouse gas emissions	Tons CO2e*	0.0	0.2	0.5	0.0	0.0	0.0	0.8
Land & Ecosystems	Qualitative Description									

** Total greenhouse gases emissions (in CO2e) include consideration of CO2, CH4, and N2O (Nitrous oxide) emissions.*
"MMBtu" = millions of Btus
"MG" = millions of gallons
"CO2e" = carbon dioxide equivalents of global warming potential
"MWh" = megawatt hours (i.e., thousands of kilowatt-hours or millions of Watt-hours)
"Tons" = short tons (2,000 pounds)

The above metrics are consistent with EPA's Methodology for Understanding and Reducing a Project's Environmental Footprint (EPA 542-R-12-002), February 2012

Notes:

Input Worksheet for Input Soil

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 2**	**Soil Investigation**

General Scope

Advance 12 soil borings to 15 feet and collect soil samples.

Example Items Eliminated through Screening Process

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Sampling personnel	1	25			25				
Driller personnel	1	60			60				
Laboratory personnel	1	20			20				

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Drilling - direct push (60 HP)	65	70%	Gasoline	0.0091	8	0.0728	3	1	60	60	Truck (mpg)	Diesel	6		10	

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Input Soil

Remedy Component that this Input worksheet is part of:	Component 2	Soil Investigation

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
					Estimated Total Electricity Usage Based on Above	0	
					Renewable Electricity Generated On-Site*		
					Total Electricity Usage Based on Personnel Transportation	0	
					Total Grid Electricity Used	0	

**** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).***

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
			Totals	0	0	0

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
			Total	0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														

**** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.***

***** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Input Soil

Remedy Component that this Input worksheet is part of:	Component 2	Soil Investigation

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation **	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for Input Soil

Remedy Component that this Input worksheet is part of:	Component 2	Soil Investigation

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Off-site Laboratory Analysis - VOCs	26	
Totals	**26**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for Input Groundwater

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 3**	**Groundwater Investigation**

General Scope

Install five groundwater monitoring wells and collect one round of sampling

Example Items Eliminated through Screening Process

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Sampling personnel	2	25	Car	Gasoline	50	25		2	One for installation, one for sampling
Driller personnel	1	60	Car	Gasoline	60	25		2.4	
Laboratory personnel	1	20	Car	Gasoline	20	25		0.8	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Drilling - direct push (60 HP)	65	70%	Gasoline	0.0091	4	0.0364	3	1	60	60	Truck (mpg)	Diesel	6		10	Half day drilling, half day well construction

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Input Groundwater

Remedy Component that this Input worksheet is part of:	Component 3	Groundwater Investigation

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
					Estimated Total Electricity Usage Based on Above	0	
					Renewable Electricity Generated On-Site*		
					Total Electricity Usage Based on Personnel Transportation	0	
					Total Grid Electricity Used	0	

**** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).***

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
			Totals	0	0	0

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
			Total	0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
Well Casing		0.0845		Refined	Virgin	Yes		30	1	No	30	Truck (mpg)	Diesel	6		5.000	
Well Screen		0.0175		Refined	Virgin	Yes		30	1	No	30	Truck (mpg)	Diesel	6		5.000	
Grout for Annulus and Abandon		0.8		Refined	Virgin	Yes		30	1	No	30	Truck (mpg)	Diesel	6		5.000	
Sand	lb	950	0.475	Refined	Virgin	Yes	25		1	No	25	Truck (mpg)	Diesel	6		4.167	
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														

**** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.***

***** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Input Groundwater

Remedy Component that this Input worksheet is part of:	Component 3	Groundwater Investigation

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation **	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
User-defined non-hazardous waste destination #1	TBD	1.65		25		1	No	25	Truck (mpg)	Diesel	6		4.2	Drill cuttings
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
Public Water	gal x 1000	0.1	0.417			Grout mix	Adsorption/evaporation
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for Input Groundwater

Remedy Component that this Input worksheet is part of:	Component 3	Groundwater Investigation

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Off-site Laboratory Analysis - VOCs	6	
Totals	**6**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for Input Soil Vapor

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 1**	**Soil Vapor Investigation**

General Scope

Install two soil vapor points, collect indoor air and soil vapor samples

Example Items Eliminated through Screening Process

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Sampling personnel	1	25	Car	Gasoline	25	25		1	Vapor sampling
Laboratory personnel	1	20	Car	Gasoline	20	25		0.8	

** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.*

*** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).*

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes

** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.*

*** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.*

**** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.*

Input Worksheet for Input Soil Vapor

Remedy Component that this Input worksheet is part of:	Component 1	Soil Vapor Investigation

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
					Estimated Total Electricity Usage Based on Above	0	
					Renewable Electricity Generated On-Site*		
					Total Electricity Usage Based on Personnel Transportation	0	
					Total Grid Electricity Used	0	

**** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).***

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
			Totals	0	0	0

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
			Total	0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														

**** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.***

***** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Input Soil Vapor

Remedy Component that this Input worksheet is part of:	Component 1	Soil Vapor Investigation

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation **	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.*

*** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.*

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.*

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for Input Soil Vapor

Remedy Component that this Input worksheet is part of:	Component 1	Soil Vapor Investigation

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

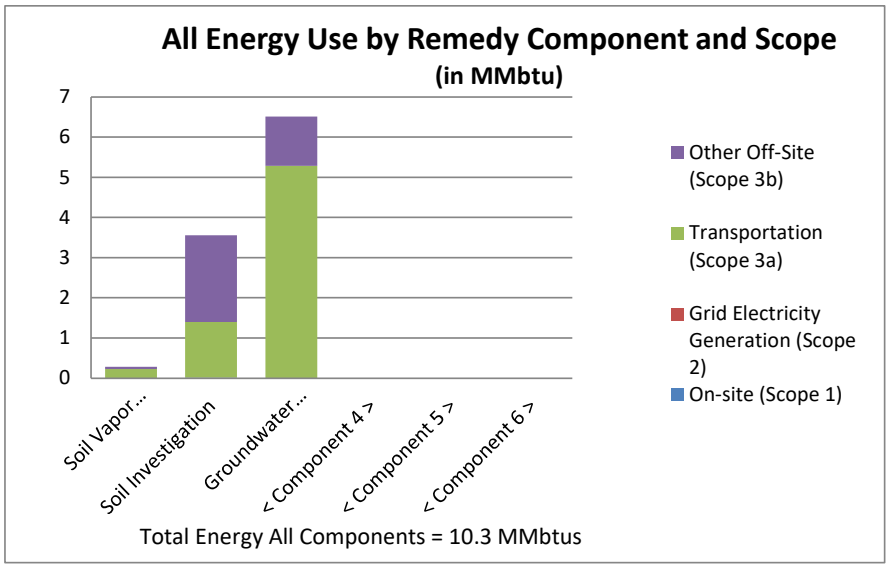
Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

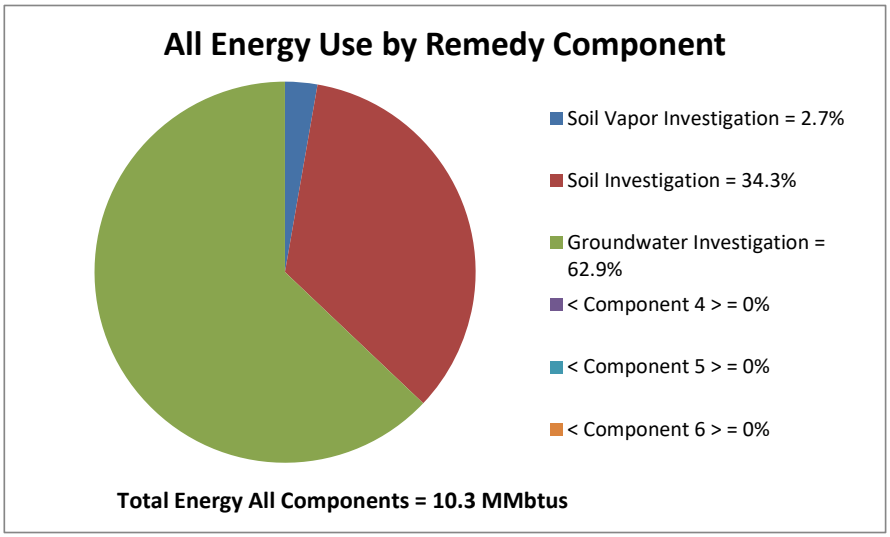
**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

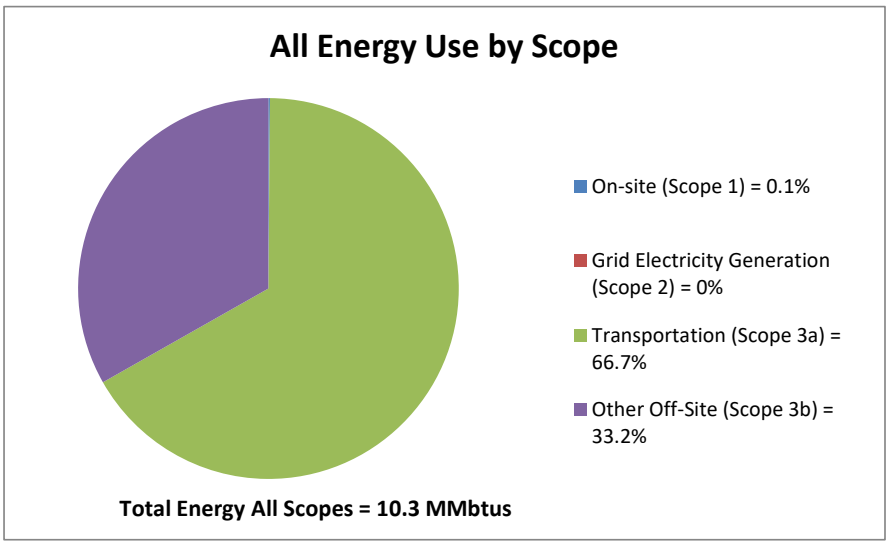
Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Totals	**0**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	


All Energy Use by Remedy Component and Scope
(in MMbtu)
7
6
5
4
3
2
1
0
Soil Vapor...
Soil Investigation
Groundwater...
<Component 4>
<Component 5>
<Component 6>
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
Total Energy All Components = 10.3 MMbtus


All Energy Use by Remedy Component
Soil Vapor Investigation = 2.7%
Soil Investigation = 34.3%
Groundwater Investigation = 62.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
Total Energy All Components = 10.3 MMbtus


All Energy Use by Scope
On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 66.7%
Other Off-Site (Scope 3b) = 33.2%
Total Energy All Scopes = 10.3 MMbtus

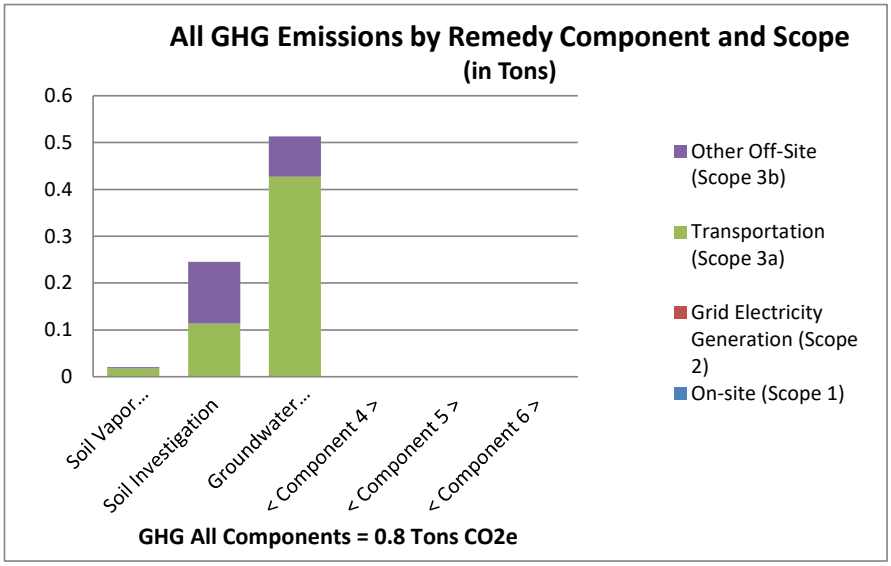
Total Energy
MMbtus

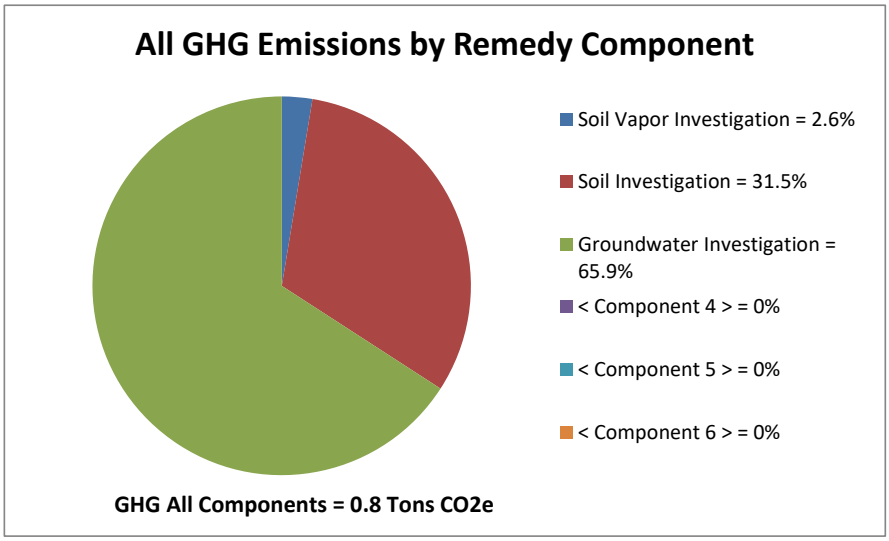
	Soil Vapor	Soil Investi	Groundwa	< Compon	< Compon	< Compon	Total	
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	0.2	1.4	5.3	0.0	0.0	0.0	6.9	Trar
ner Off-Site (Scope 3b)	0.1	2.2	1.2	0.0	0.0	0.0	3.4	Oth
Total	0.3	3.6	6.5	0.0	0.0	0.0	10.3	

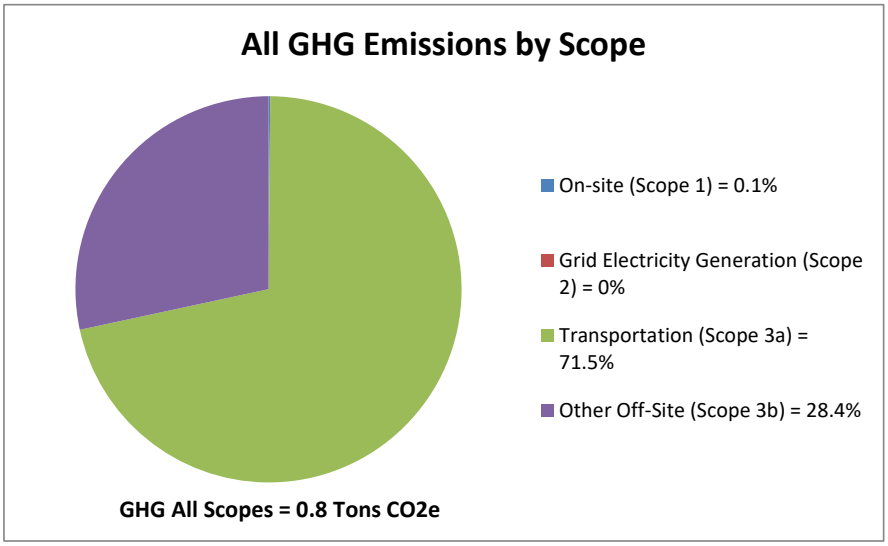
Soil Vapor Investigation = 2.7%
Soil Investigation = 34.3%
Groundwater Investigation = 62.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 66.7%
Other Off-Site (Scope 3b) = 33.2%

Total Energy All Components = 10.3 MMbtus
Total Energy All Scopes = 10.3 MMbtus


All GHG Emissions by Remedy Component and Scope
(in Tons)
0.6
0.5
0.4
0.3
0.2
0.1
0
Soil Vapor...
Soil Investigation
Groundwater...
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
GHG All Components = 0.8 Tons CO2e


All GHG Emissions by Remedy Component
Soil Vapor Investigation = 2.6%
Soil Investigation = 31.5%
Groundwater Investigation = 65.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
GHG All Components = 0.8 Tons CO2e

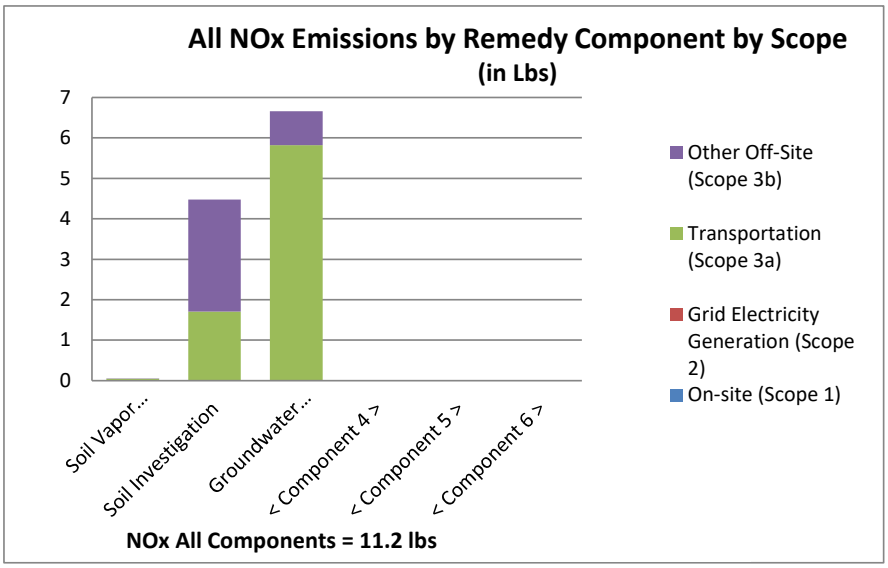

All GHG Emissions by Scope
On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 71.5%
Other Off-Site (Scope 3b) = 28.4%
GHG All Scopes = 0.8 Tons CO2e

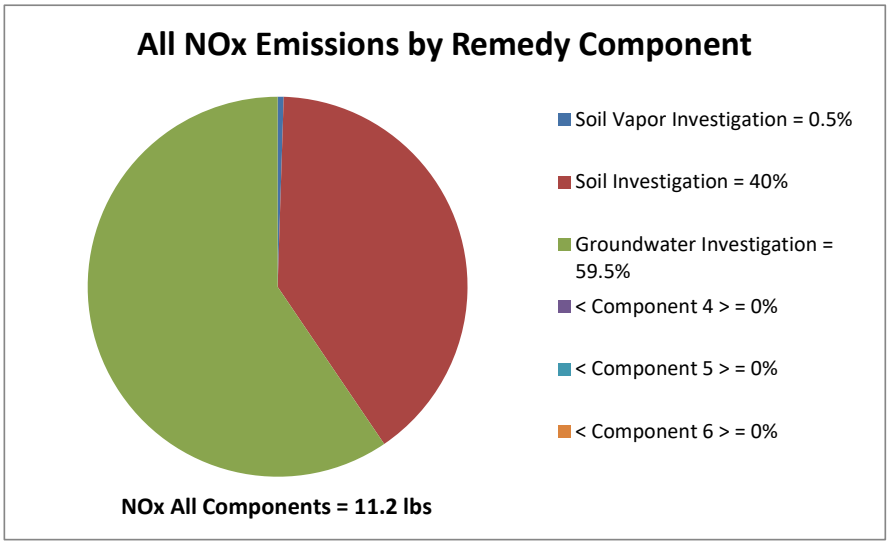
GHG Tons CO2e	Soil Vapor	Soil Investi	Groundwa	< Compon	< Compon	< Compon	Total	
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	0.0	0.1	0.4	0.0	0.0	0.0	0.6	Trar
ner Off-Site (Scope 3b)	0.0	0.1	0.1	0.0	0.0	0.0	0.2	Oth
Total	0.0	0.2	0.5	0.0	0.0	0.0	0.8	

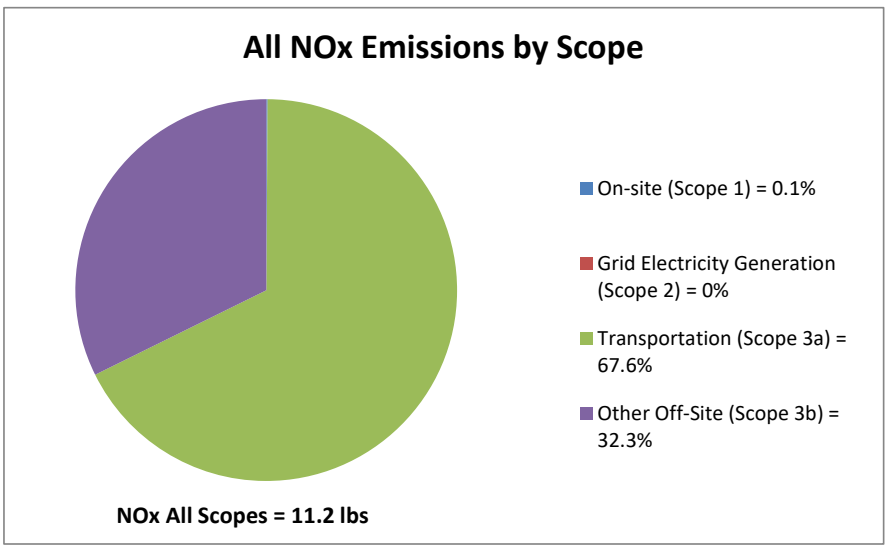
Soil Vapor Investigation = 2.6%
Soil Investigation = 31.5%
Groundwater Investigation = 65.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 71.5%
Other Off-Site (Scope 3b) = 28.4%

GHG All Components = 0.8 Tons CO2e
GHG All Scopes = 0.8 Tons CO2e


All NOx Emissions by Remedy Component by Scope
(in Lbs)
7
6
5
4
3
2
1
0
Soil Vapor...
Soil Investigation
Groundwater...
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
NOx All Components = 11.2 lbs


All NOx Emissions by Remedy Component
Soil Vapor Investigation = 0.5%
Soil Investigation = 40%
Groundwater Investigation = 59.5%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
NOx All Components = 11.2 lbs

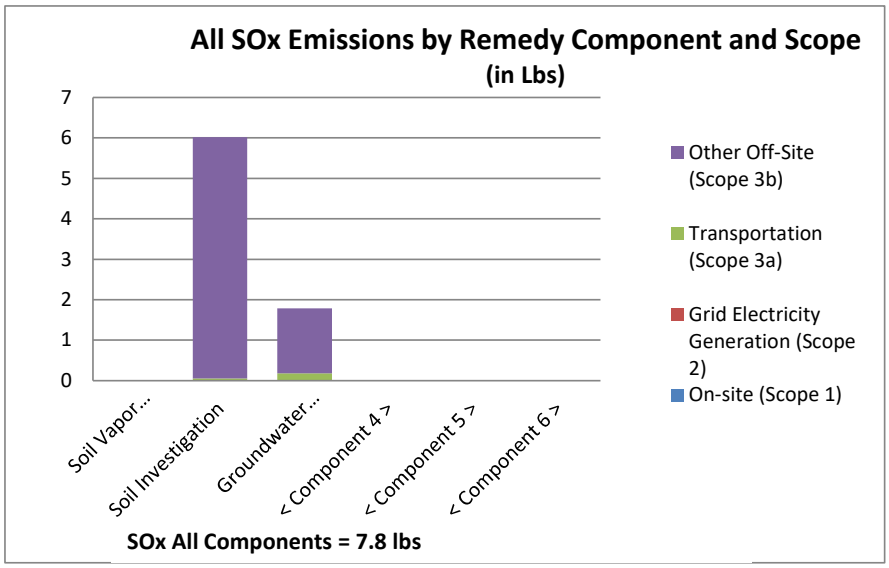

All NOx Emissions by Scope
On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 67.6%
Other Off-Site (Scope 3b) = 32.3%
NOx All Scopes = 11.2 lbs

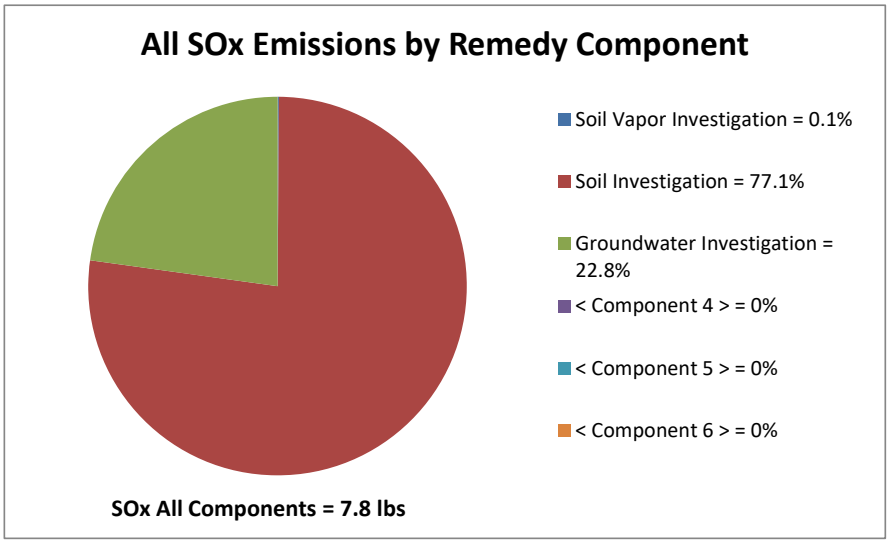
NOx lbs	Soil Vapor	Soil Investi	Groundwa	< Compon	< Compon	< Compon	Total	
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	0.0	1.7	5.8	0.0	0.0	0.0	7.6	Trar
ner Off-Site (Scope 3b)	0.0	2.8	0.8	0.0	0.0	0.0	3.6	Oth
Total	0.1	4.5	6.7	0.0	0.0	0.0	11.2	

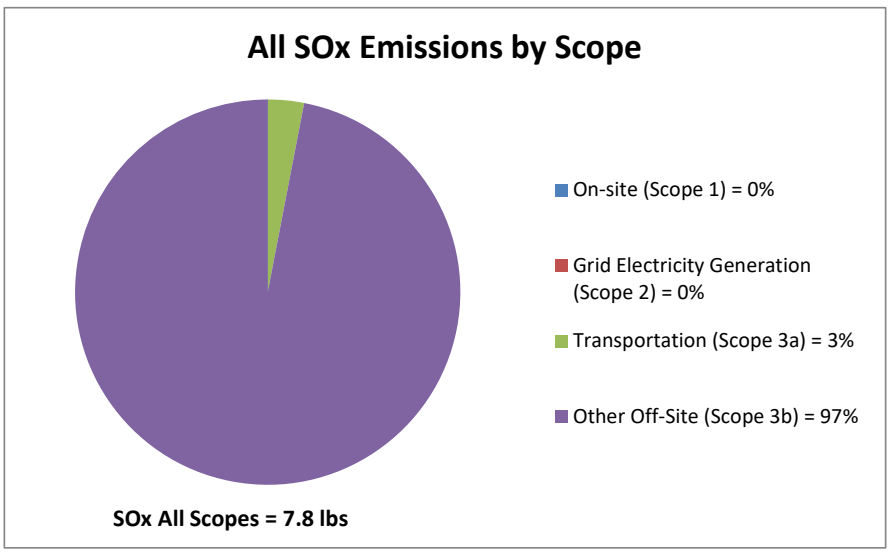
Soil Vapor Investigation = 0.5%
Soil Investigation = 40%
Groundwater Investigation = 59.5%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0.1%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 67.6%
Other Off-Site (Scope 3b) = 32.3%

NOx All Components = 11.2 lbs
NOx All Scopes = 11.2 lbs


All SOx Emissions by Remedy Component and Scope
(in Lbs)
7
6
5
4
3
2
1
0
Soil Vapor...
Soil Investigation
Groundwater...
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
SOx All Components = 7.8 lbs


All SOx Emissions by Remedy Component
Soil Vapor Investigation = 0.1%
Soil Investigation = 77.1%
Groundwater Investigation = 22.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
SOx All Components = 7.8 lbs

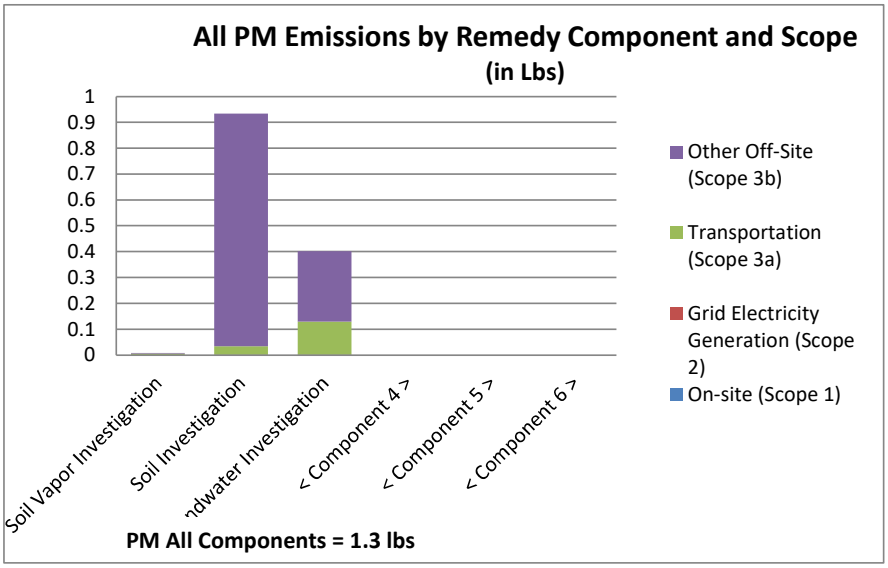

All SOx Emissions by Scope
On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 3%
Other Off-Site (Scope 3b) = 97%
SOx All Scopes = 7.8 lbs

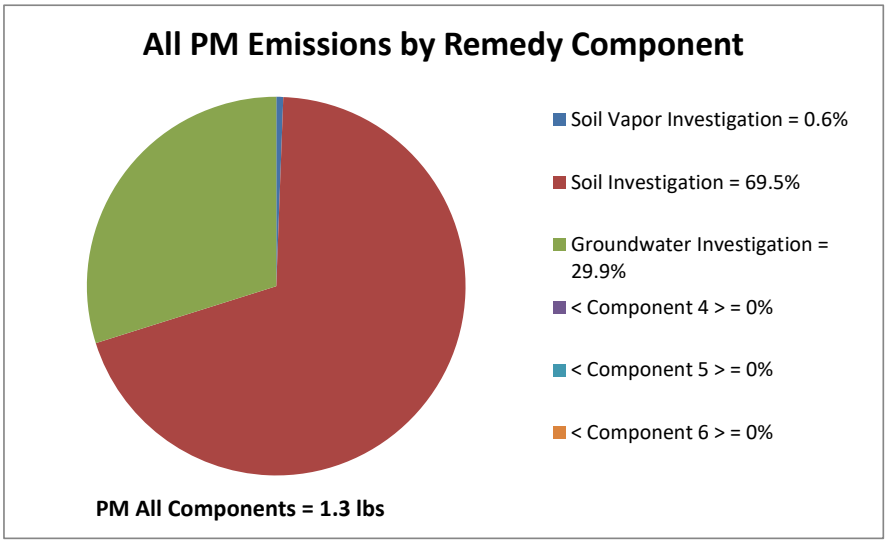
SOx lbs	Soil Vapor	Soil Investi	Groundwa	< Compon	< Compon	< Compon	Total	
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	0.0	0.1	0.2	0.0	0.0	0.0	0.2	Trar
her Off-Site (Scope 3b)	0.0	6.0	1.6	0.0	0.0	0.0	7.6	Oth
Total	0.0	6.0	1.8	0.0	0.0	0.0	7.8	

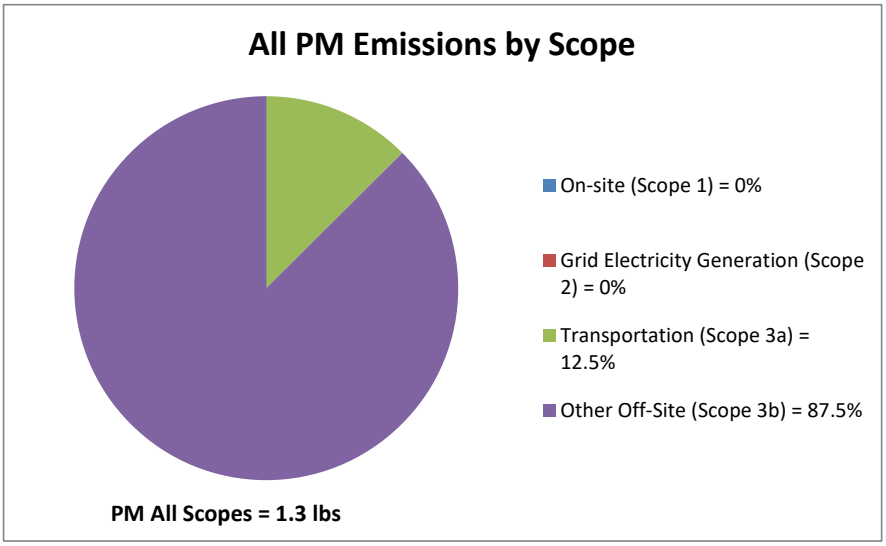
Soil Vapor Investigation = 0.1%
Soil Investigation = 77.1%
Groundwater Investigation = 22.8%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 3%
Other Off-Site (Scope 3b) = 97%

SOx All Components = 7.8 lbs
SOx All Scopes = 7.8 lbs


All PM Emissions by Remedy Component and Scope
(in Lbs)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Soil Vapor Investigation
Soil Investigation
ndwater Investigation
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
PM All Components = 1.3 lbs


All PM Emissions by Remedy Component
Soil Vapor Investigation = 0.6%
Soil Investigation = 69.5%
Groundwater Investigation = 29.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
PM All Components = 1.3 lbs

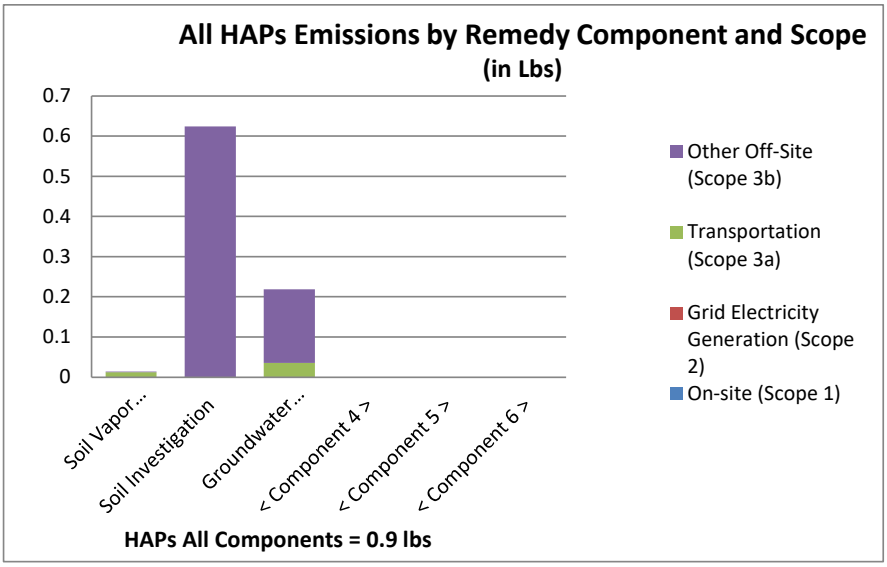

All PM Emissions by Scope
On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 12.5%
Other Off-Site (Scope 3b) = 87.5%
PM All Scopes = 1.3 lbs

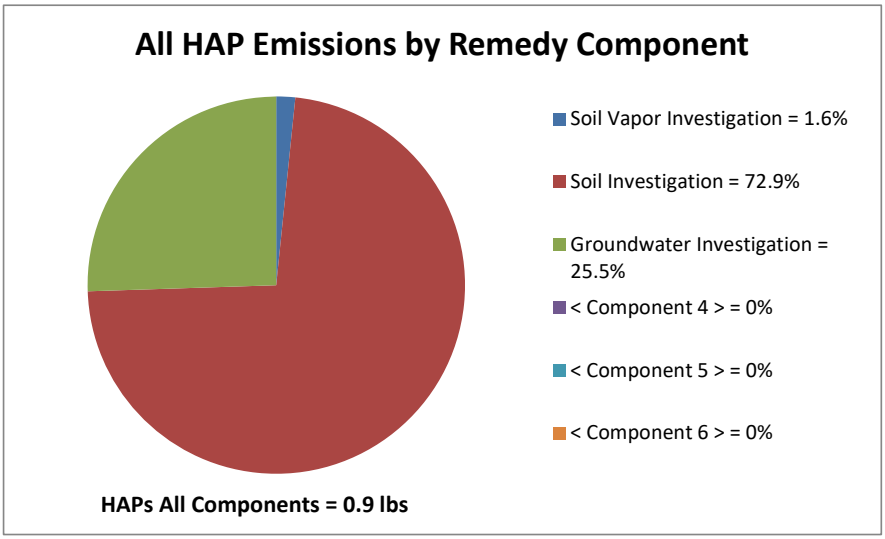
PM lbs	Soil Vapor	Soil Investi	Groundwa	< Compon	< Compon	< Compon	Total	
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	d Electricity
nsportation (Scope 3a)	0.0	0.0	0.1	0.0	0.0	0.0	0.2	Trar
ner Off-Site (Scope 3b)	0.0	0.9	0.3	0.0	0.0	0.0	1.2	Oth
Total	0.0	0.9	0.4	0.0	0.0	0.0	1.3	

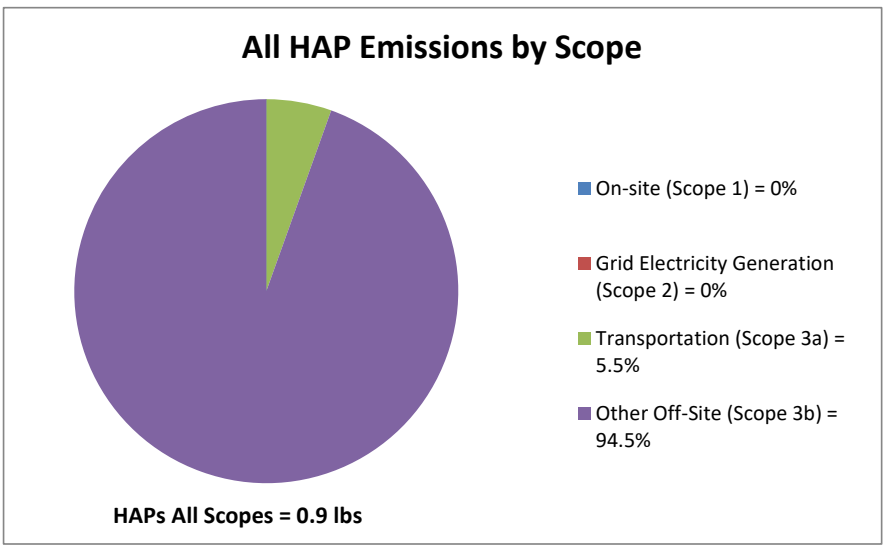
Soil Vapor Investigation = 0.6%
Soil Investigation = 69.5%
Groundwater Investigation = 29.9%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 12.5%
Other Off-Site (Scope 3b) = 87.5%

PM All Components = 1.3 lbs
PM All Scopes = 1.3 lbs


All HAPs Emissions by Remedy Component and Scope
(in Lbs)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Soil Vapor...
Soil Investigation
Groundwater...
< Component 4 >
< Component 5 >
< Component 6 >
Other Off-Site (Scope 3b)
Transportation (Scope 3a)
Grid Electricity Generation (Scope 2)
On-site (Scope 1)
HAPs All Components = 0.9 lbs


All HAP Emissions by Remedy Component
Soil Vapor Investigation = 1.6%
Soil Investigation = 72.9%
Groundwater Investigation = 25.5%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%
HAPs All Components = 0.9 lbs


All HAP Emissions by Scope
On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 5.5%
Other Off-Site (Scope 3b) = 94.5%
HAPs All Scopes = 0.9 lbs

HAPs lbs	Soil Vapor	Soil Investi	Groundwa	< Compon	< Compon	< Compon	Total
On-site (Scope 1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generation (Scope 2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
nsportation (Scope 3a)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ner Off-Site (Scope 3b)	0.0	0.6	0.2	0.0	0.0	0.0	0.8
Total	0.0	0.6	0.2	0.0	0.0	0.0	0.9

Soil Vapor Investigation = 1.6%
Soil Investigation = 72.9%
Groundwater Investigation = 25.5%
< Component 4 > = 0%
< Component 5 > = 0%
< Component 6 > = 0%

On-site (Scope 1) = 0%
Grid Electricity Generation (Scope 2) = 0%
Transportation (Scope 3a) = 5.5%
Other Off-Site (Scope 3b) = 94.5%

HAPs All Components = 0.9 lbs
HAPs All Scopes = 0.9 lbs

APPENDIX G:

Key Personnel Qualifications

JAMES P. CINELLI, P.E., P.G., BCEE *CURRICULUM VITAE*

Principal Consultant

Fields of Competence

Mr. Cinelli has over 30 years of experience in environmental consulting for the real estate community with an emphasis in the areas of environmental site assessments, soil & groundwater remediation, remediation system design, brownfield redevelopment, and storage tank management. He is also highly regarded for his work on spill prevention and response plans; stormwater and wastewater systems design, permitting and construction; erosion control plans; stream encroachment and earth disturbance permitting; and waste management. Known for his business-minded approach to environmental concerns, he has written and lectured on numerous site assessment and remediation issues and other environmental compliance matters. He is a qualified expert witness.

Employment

2004 to Present: President, Liberty Environmental, Inc., Reading, Pennsylvania

2000 to 2004: Vice President, UAI Environmental, Inc., Reading, Pennsylvania

1998 to 2000: Engineering Group Manager, RT Environmental Services, Inc., King of Prussia, PA

1990 to 1998: Civil/Environmental Engineer, Environmental Research, Inc., Reading, Pennsylvania

Credentials

M. Eng, Environmental Engineering, Pennsylvania State University (2000)
MBA, Business Administration, St. Joseph's University (1995)
B.S., Civil Engineering, Lehigh University (1990)
Professional Engineer registered in Pennsylvania, Delaware, New Jersey, Maryland, Ohio, and New York
Professional Geologist in New York
Board Certified Environmental Engineer, American Academy of Environmental Engineers
New Jersey UST Closure and Subsurface Investigation certifications
Peer reviewer for manuscripts on soil remediation, *International Journal of Soil, Sediment and Water*
Contributing author, "Guidebook on Complying with Pennsylvania Environmental Laws and Regulations: Seventh Edition", Pennsylvania Chamber of Business and Industry

Training and Associations

40-Hour Hazwoper and 8-Hour Hazwoper Supervisor Training
Environmental Forensics, NGWA, 2006
SPCC Workshop, WEF, 2006
Natural Attenuation Potential of MTBE and Alternative Oxygenates, Battelle, 2002
MTBE Treatment and Technology: Design and Implementation, NGWA, 2001
Advanced Hazardous Waste Management, ERC, 2000
Member of American Society of Civil Engineers
Member of National Society of Professional Engineers

Principal Consultant

Member of Environmental & Water Resources Institute

Key Projects

27-09 40th Avenue, Queens, NY: Designed remediation systems including a soil vapor extraction (SVE) system and sub-slab depressurization system (SSDS) at a New York State Brownfield Cleanup Program site. Oversaw installation of the systems and operation start-up. Also oversaw the installation of a zero valent iron (ZVI) permeable reactive barrier and injection of chemical oxidant compound in groundwater at a source area for chlorinated solvents.

Warehouse Development Site, Philadelphia, PA: Prepared an Erosion & Sediment Pollution Control Plan for regrading of a golf course that is planned for redevelopment as a warehouse. The project included obtaining an NPDES permit for construction activities from the Pennsylvania Department of Environmental Protection, and obtaining stormwater management approval from the Philadelphia Water Department.

DAP Corporation, Baltimore, MD: Designed a stormwater detention basin retrofit in accordance with current Maryland design standards, in order to comply with the Maryland NPDES Industrial Stormwater Permit requirements. The design included a flow diversion berm, micropools, outlet structure, and native vegetation planting specifications.

Tilley Chemical Company, Baltimore, MD: Designed a stormwater detention basin retrofit in accordance with current Maryland design standards, in order to comply with the Maryland NPDES Industrial Stormwater Permit requirements. The design included a flow diversion baffle, sediment forebay, outlet structure, and grading for volume expansion.

Mars Wrigley, Elizabethtown, PA: Prepared an Erosion & Sediment Pollution Control Plan for a food manufacturing plant expansion. The project included obtaining an NPDES permit for construction activities from the Pennsylvania Department of Environmental Protection, and designing Post-Construction Stormwater Management facilities.

Crystal Lake, Mount Penn, Berks County, PA: Managed a pond evaluation and rehabilitation project for a recreational lake located in Carsonia Park. The recreational lake is at the center of a community park redevelopment project. The project began with an evaluation of water quality, including sampling and monitoring of water quality parameters for a six-month period. Based on the results of the evaluation, the pond was redesigned to include a wetland to treat urban stormwater, perimeter plantings, and dredging. Work included preparation of an Erosion and Sediment Pollution Control Plan, and obtaining a water encroachment permit from the Pennsylvania Department of Environmental Protection and a Section 404 permit from the U.S. Army Corps of Engineers.

Truck Stop, Shartlesville, PA: Under a Consent Order from the PADEP Bureau of Dams and Waterways, designed a culvert, riprap-lined channel and energy dissipation device where an unpermitted filling of a stream channel had taken place. Work included a hydrological study of the upstream watershed, preparation of an erosion control plan, and construction costing.

Cambridge-Lee Industries, Reading, PA: Designed a constructed wetland for removal of copper from industrial stormwater and cooling water discharge, and prepared an erosion control plan for same. Work included design of a custom concrete intake structure for diversion of low stream flows to the wetland while bypassing high storm flows, design of a submerged outfall structure, and design of an

impermeable polyethylene liner due to the site's location in karst topography. The constructed wetland reduced copper concentrations by 90%, below the facility's NPDES permit limits.

Beech Island Deck Construction, Londonderry Township, Dauphin County, PA: Managed a watercourse permitting project for a residential property owner who had constructed a 5,000 square-foot deck in the floodway of the Susquehanna River without obtaining the proper permits. Prepared a floodplain permit application for the Township, and prepared a Pennsylvania DEP Joint Permit application. Oversaw floodplain modeling to determine the pre- and post-construction water elevations during the 100-year storm event.

Berks Hollow Natural Gas Power Plant, Ontelaunee, PA: Managed a watercourse permitting project for a proposed natural gas power plant on a 36-acre former industrial site that included a 3,000-foot power line corridor and a 2,000-foot utility corridor. Project activities included delineation of wetlands and regulated waters, a U.S. Army Corps of Engineers Jurisdictional Determination, a Phase I bog turtle habitat assessment, and Pennsylvania DEP/U.S. Army Corps of Engineers Joint Permit application.

Garden State Growers, Flemington, NJ: Prepared stormwater management facilities, including five stormwater detention/sediment basins. Prepared stream encroachment permit applications for three stream crossings and five detention basin outfalls.

Cataldi Waste Disposal, Inc., Reading, PA: Served as design engineer and project manager on 10-acre land development project for a recyclable materials transfer station. Responsibilities included site grading, vertical and horizontal alignment of industrial access driveway, design of stormwater management facilities, and preparation of an erosion control plan.

Central Catholic High School, St. Lawrence, PA: Designed grading, stormwater conveyance facilities, and erosion control plan for the expansion of practice fields at a high school athletic center.

United States Postal Service, Bellmawr, NJ and Wilmington, DE: Designed/specified wastewater recycling systems for USPS vehicle maintenance facilities. Work included reviewing building drawings, surveying drain sizes and depths, designing collection trenching and piping, and preparing performance specifications for wastewater recycling equipment. Performed construction inspections.

Limestone Quarry, Bechtelsville, PA: Designed/specified a wastewater recycling system for truck maintenance and washing operations. Work included reviewing building drawings, surveying drain sizes and depths, and wash pad and collection sump design.

C.S. Garber & Sons, Boyertown, PA: Designed/specified a wastewater recycling system for drill rig washing operations. Work included surveying building dimensions, design of a dual gate-controlled wash pad and a 5,000-gallon sediment settling tank, specification of ultrafiltration water recycle equipment, and construction management.

Sun Drilling Products, Belle Chase, LA: Designed a vehicle washwater treatment system and performed NPDES permitting for a drilling products manufacturer. Washwater treatment system design included a topographic survey, settling tank design, vehicle entry/exit ramp design, and oil/water separator specification. An NPDES permit was secured for the washwater discharge and a new Styrene Divinyl-Benzene Copolymer manufacturing plant.

Convenience Store, Coatesville, PA: Performed an evaluation of a malfunctioning small flow sewage treatment system. Established improved system operating procedures and retrofitted the system with a

second aerator to ensure compliance with NPDES permit limits. Performed monthly maintenance and prepared discharge monitoring reports.

Oley Valley Elementary Center, Oley, PA: Designed stormwater management facilities and prepared erosion control plan, and prepared a stream crossing general permit application for a proposed elementary education facility. Due to the extensive area of soil disturbance, an Earth Disturbance Permit was secured from the Pennsylvania Department of Environmental Protection.

Golden Oaks Golf Club, Pricetown, PA: Designed stormwater management facilities and prepared erosion control plan for a 280-acre championship golf course. Due to the extensive area of soil disturbance, an Earth Disturbance Permit was secured from the Pennsylvania Department of Environmental Protection. The design included five sediment/stormwater detention basins, and several diversion swales and sediment traps.

Industrial Overall PCE Site, New Rochelle, NY: On behalf of the purchaser of the property, conducted a vapor intrusion investigation at a New York State superfund site. Following the completion of the investigation, a vapor mitigation system was designed and installed. By installing the sub-slab depressurization system and sealing floor penetrations, contaminant concentrations in indoor air were reduced below New York Department of Health action levels.

Ingersoll Development Project, Brooklyn, NY: Served as engineer-in-charge on a development project on a New York City Housing Authority property. Site investigation activities identified historical fill with elevated concentrations of metals and organic compounds, and separate phase liquid on groundwater from a leaking heating oil tank. The project involved design and installation oversight for an engineered vapor barrier system, as well as screening and tracking of contaminated material being excavated from the site.

Ainslee Street Redevelopment Project, Brooklyn, NY: Served as engineer-in-charge on a redevelopment project on a former industrial property that was being redeveloped as a restaurant. Work was performed under New York City's Voluntary Cleanup Program at an E-Designation program. Site investigation activities identified historical fill with elevated concentrations of metals and organic compounds, and volatile organic compounds in groundwater. The project involved design and installation oversight for an engineered vapor barrier system and a sub-slab depressurization system, as well as screening and tracking of contaminated material being excavated from the site.

Hillside Avenue Redevelopment Project, Queens, NY: Managed a Remedial Investigation conducted under New York City's Voluntary Cleanup Program at an E-Designated site planned for redevelopment. The site was historically used for manufacturing and was recently used as a parking lot. Soil and soil vapor sampling was performed under a NYC OER-approved work plan. The development of the site will include construction of an 8-story mixed use building.

Queens Boulevard Redevelopment Project, Queens, NY: Managed a Remedial Investigation conducted under New York City's Voluntary Cleanup Program at an E-Designated site planned for redevelopment. The site included two adjoining properties with several tenants, including light manufacturing and automotive uses. Soil, groundwater and soil vapor sampling was performed under a NYC OER-approved work plan. The work included installation and sampling six sub-slab vapor points, 13 Geoprobe soil borings, and five temporary well points. The development of the site will include demolition of the existing commercial buildings and construction of a 10-story mixed use building.

Carroll Gardens Redevelopment Project, Brooklyn, NY: Managed a Remedial Investigation conducted under New York City's Voluntary Cleanup Program at an E-Designated site planned for redevelopment. The site was occupied by an automotive garage. Soil, groundwater and soil vapor sampling was performed under a NYC OER-approved work plan. The work included advancing six Geoprobe soil borings, installation and sampling four sub-slab vapor points, and three temporary well points. The site will be redeveloped as townhomes.

Laurel Center II, Reading, PA: Managed environmental assessment and remediation activities at a 19-acre brownfield site with a 150-year history of industrial operations. As early as the 1860's, Reading Tube Plant #1 was the site of heavy industrial activities. A total of 31 areas of concern were identified at the site during the first phase of investigations. Site characterization and remediation activities were coordinated with the Pennsylvania Department of Environmental Protection, and agency reviews were expedited as a result of the site's acceptance into the state's Brownfield Action Team program. Following thorough investigation of soil, groundwater and waste materials at the site, three areas were targeted for remediation, including remediation of soil impacted by PCB's and heavy metals, the removal of petroleum storage tanks and removal of hazardous waste from the former chrome-plating operation. Groundwater impacts at the site were addressed through a detailed analysis of containment fate-and- transport using both groundwater and surface water computer models. These modeling efforts demonstrated the elimination of the groundwater and surface water exposure pathways, eliminating the need for costly groundwater remediation. An Act 2 Release of Liability was granted by PADEP using both Statewide Health Standards and Site-Specific Standards. The site is currently planned for industrial reuse, including a waste-to-energy power generation facility.

The Goggle Works, Reading, PA: Managed the environmental assessment of an 11-acre brownfield site under Pennsylvania's Land Recycling Program ("Act 2"). The site covered several former industrial properties, including Willson Safety Products (a safety goggle manufacturer), Stelwagon Lumber, an iron foundry, and a hosiery mill. A Phase I Environmental Site Assessment was performed and a Baseline Environmental Investigation Workplan was submitted for Pennsylvania Department of Environmental Protection (DEP) approval. Site assessment activities were then performed in the seven areas of concern that were identified on the site. The site assessment activities included a geophysical investigation utilizing electromagnetic and ground penetrating radar methods, installation of nine groundwater monitoring wells, groundwater sampling and groundwater contour mapping, advancement of numerous soil borings and collection of soil samples. Also, an asbestos survey was performed on all buildings, and PCB-containing equipment was sampled and quantified. Due to shallow bedrock and the discovery of free product on groundwater, a soil vapor investigation was performed in two of the areas of concern to determine if vapor intrusion into buildings presented a health threat to building occupants. An Act 2 Final Report was submitted to PADEP proposing Site-Specific standards for petroleum constituents and chlorinated solvents in groundwater. On August 21, 2004, Governor Ed Rendell announced that the Goggle Works project was approved for $3 million in state funds to convert the site into an arts center. "The Goggle Works Center for the Arts" was built and includes a cafe, 40 artist studios, a film and performance theater, five galleries and a glass blowing center.

18th & Callowhill Streets Site, Philadelphia, PA: Managed site remediation project at a former transformer manufacturing facility. Site work included reconstruction of a concrete retaining wall, installation of temporary shoring to enable excavation to the property boundary while protecting the adjacent streets and utilities, excavation and disposal of approximately 1,000 tons PCB–contaminated

soil, and installation of HDPE cap. Managed health and safety concerns through an active public participation program, and secured a Release of Liability through Pennsylvania's Land Recycling Program.

Baldwin Locomotive Works, Eddystone, PA: Conducted site assessment activities under Pennsylvania's Land Recycling Program. Work included groundwater monitoring well installation, soil borings, a test pit investigation and preparation of a Remedial Operation & Maintenance Plan to address impacted soils encountered during redevelopment of the site. Conducted PCB testing in an electric substation containing 30 transformers and capacitors.

Scattered Sites, North and South Carolina: Managed the decommissioning of five bleach and dye facilities, including asbestos inspections and abatement, characterization and disposal of drummed waste materials, assessment and remediation of contaminated soil and groundwater (petroleum products and chlorinated solvents), and aboveground and underground storage tank removals.

Jefferies Knitting Mill, Albemarle, NC: Managed the decommissioning of a former bleach and dye facility. Provided management of approximately 200 drums of waste, including drum inventory, material characterization, consolidation, transportation and disposal. Conducted site assessment activities to delineate the extent of PCE in groundwater from former dry cleaning operation. Performed the removal of two 50,000 gallon #6 fuel oil USTs and off-site bioremediation of 600 tons of impacted soil. Conducted an asbestos inspection in preparation for future building demolition.

Pennsylvania Steel, Hamburg, PA: Managed environmental assessment activities at this site in pursuit of a Release of Liability under Pennsylvania's Land Recycling ("Act 2") Program. Historic industrial activities at the site included steel and stainless steel foundry operations, as well as truck body manufacturing. Investigated numerous areas of concern, including nine (9) underground storage tanks, an oil-water separator, and two (2) areas where foundry sand and slag were buried. Groundwater investigation activities, including installation of five (5) groundwater monitoring wells, aquifer testing, and fate-and-transport modeling were also performed. A Release of Liability was obtained under Statewide Health Standards for soil, and a Site-Specific Standard was established for naphthalene in groundwater utilizing the results of the Bioscreen fate-and-transport modeling that was performed. Other environmental investigation activities performed at the site included a comprehensive asbestos inspection, a radiological survey at a former non-destructive metal testing facility, and Johnson & Ettinger vapor intrusion modeling.

Limestone Quarry, Perkiomenville, PA: Prepared an application for a modification of an existing mining permit, for deepening of the quarry by 100 feet. Performed a topographic survey of a sedimentation basin to demonstrate compliance with NPDES permit requirements.

Convenience Store, Lancaster County, PA: Removed 8,000 gallon gasoline UST and conducted a site characterization to delineate the extent of soil groundwater impact. Designed and installed a granular activated carbon pump-and-treat system, and secured NPDES permit for surface discharge of treated effluent. Conducted a fate-and-transport study to demonstrate attainment of Statewide Health Standards, and secured a release of liability through Pennsylvania's Land Recycling Program.

Woodruff Oil, Bridgeton, NJ: Managed the design and installation of a secondary containment upgrade at a bulk fuel storage facility, in order to comply with recent changes to aboveground storage tank regulations. The secondary containment upgrade included a high-density polyethylene (HDPE) liner. The project required the design of a special perimeter anchoring system due to the proximity of

adjoining structures. Site-specific designs for liner penetrations were necessary, due to the size, number and type of obstructions that were present (tanks, pipe supports, pump house, etc.).

Poultry Processing Facility, Lebanon County, PA: An emergency response firm responded to a release of sulfuric acid from an aboveground storage tank at a poultry processing facility (location confidential). After the emergency response firm completed the excavation of heavily impacted soil, a site assessment and risk assessment were performed under Pennsylvania's Act 2 guidance. Systematic random grid sampling was conducted, and a risk assessment was performed, which indicated that residual contaminants remaining in the soil were protective to human health and the environment. An Act 2 Release of Liability was granted by PADEP using a Site-Specific Standard.

Convenience Store, Downingtown, PA: Performed a site characterization in response to a release of gasoline from an underground storage tank system. Designed and managed soil vapor extraction and bioventing feasibility studies to evaluate the effectiveness of these technologies for remediation of gasoline-impacted soil. Prepared a Remedial Action Plan which was approved by the Pennsylvania Department of Environmental Protection, and designed a bioventing remediation system. Managed construction and operation of the remediation system.

Convenience Store, Lancaster County, PA: Performed a site characterization in response to a release of gasoline from an underground storage tank system. Designed and managed a soil vapor extraction feasibility study to evaluate the effectiveness of this technology for remediation of gasoline-impacted soil. Prepared a Remedial Action Plan which was approved by the Pennsylvania Department of Environmental Protection, and designed a dual-phase extraction remediation system, utilizing a liquid ring pump, an air stripper, and vapor phase carbon, to simultaneously remediate soil and groundwater. Managed construction and operation of the remediation system.

Convenience Store, Coatesville, PA: Performed a remedial alternatives analysis for treatment of gasoline-contaminated groundwater. Selected an innovative design – a Trickling Filter Bioreactor – over more traditional technologies such as granular activated carbon and air strippers. Designed and installed the remediation system, and secured NPDES permit for the system's discharge. Performed monthly system maintenance, discharge monitoring and reporting. Operational cost savings of $80,000 to $100,000 per year was realized.

Berks Landfill Superfund Site, Spring Township, Berks County, PA: Performed a waste volume analysis for a PRP group. Historical aerial photographs and topographic mappings of the landfill site were reviewed in order to determine the method of landfill construction, and to estimate the depth of buried waste. A grid was overlaid on the waste disposal areas, and the total volume of waste was calculated based on estimated depth of waste at each grid point. A summary report was submitted to the PRPs' attorneys for Superfund litigation defense.

Cambridge-Lee Industries, Reading, PA: Obtained discharge approvals from Pennsylvania DEP and Delaware River Basin Commission (DRBC) for a proposed copper tube manufacturing facility. The project involved revisions to an existing NPDES permit and submitting a TDS Waiver Request to DRBC in order to discharge high concentrations of total dissolved solids from a water pre-treatment facility. The TDS Waiver Request included a stream assimilation study that demonstrated that the proposed high-TDS discharge would not result in unacceptable TDS background concentrations in the receiving stream under low-flow (Q7-10) conditions.

Principal Consultant

Cougle's Recycling, Hamburg, PA: Served as an expert witness for the defense (Cougle's Recycling). The Pennsylvania Department of Environmental Protection alleged that the facility was in violation of waste management regulations by storing municipal waste longer than permitted. Defendant successfully demonstrated to the Environmental Hearing Board that the stored recyclable materials were in fact not waste under Pennsylvania waste management regulations that the charges were dismissed.

Publications and Presentations

Cinelli, J.P., "Applied Storm Water Management for Small Watersheds," presented at Penn State Great Valley, Fall 1999.

Cinelli, J.P., "Ask a Lawyer," Served as a panel member for Berks County Bar Association's television program covering underground storage tank and water quality regulations, 1997 and 2007.

Cinelli, J.P., "Environmental Assessment and Pennsylvania's Land Recycling Program" presented at lending institutions, bench-bar association conferences, and realtor training seminars.

Cinelli, J.P., "Understanding Environmental Regulations," presented at Berks Chamber of Commerce, 2000.

Cinelli, J.P., "Ex-Situ Remediation of MTBE-Contaminated Groundwater Using a Trickling Filter Bioreactor", 2004.

Cinelli, J.P., "Spill Prevention, Control and Countermeasure Regulations," presented at the Pennsylvania Chamber of Business and Industry's Environmental Laws & Regulations Conference, 2006, 2007, and 2011 and National Society of Professional Engineer's Annual Conference, 2007.

Cinelli, J.P., "Stormwater Pollution Prevention Plans and Best Management Practices", Audio Conference provided through Progressive Business Conferences, 2006, 2007, 2012, 2013, 2014, 2015 and 2016.

Cinelli, J.P., "Pennsylvania Industrial Stormwater Permitting and Recent Regulatory Changes," presented at the Pennsylvania Chamber Environmental Conference Series, 2016.

Contributing author, "2008/2009 Guidebook on Complying with Pennsylvania Environmental Laws and Regulations", Pennsylvania Chamber of Business and Industry.

DAVID S. COYNE, M.S., QEP
Principal, Chief Operations Officer

PROFESSIONAL PROFILE

Qualifications Summary

- *Over 32 years of experience in environmental management consulting for land development, private industry, and government.*
- *Managed multi-phase environmental investigations, remedial programs, and monitoring programs for various industrial/commercial clients at over 100 facilities throughout the eastern U.S. and the Caribbean*
- *Managed over 1,000 real estate due diligence and advisory projects for private industrial, commercial and residential developers*
- *Designed and managed water resources projects including stormwater management, sewer planning, wastewater disposal feasibility, open-channel flow and dam breach modeling projects at sites throughout Pennsylvania*
- *Performed ongoing environmental compliance and permitting services for stormwater, industrial pretreatment, wastewater, and contingency planning for industrial clients throughout the eastern United States*
- *Committee Member of ASTM E50 for development of Phase I ESA Standard E1527-13 and related environmental assessment standard practices*
- *Provided expert witness and litigation support services to counsel for contaminant issues associated with land development.*

Fields of Competence

Mr. Coyne has over thirty-two years of managerial and technical project experience in the performance of groundwater and soil assessments, investigations, and remedial programs, as well as water resources and surface water studies for industrial and commercial clients throughout the eastern United States and the Caribbean. Mr. Coyne's professional area of expertise is in real estate environmental advisory services, including complex due diligence evaluations and environmental decision making for industrial or commercial property transactions. Mr. Coyne also has advanced academic and professional experience in water resources engineering, stormwater management, surface water and watershed modeling systems, dam breach flow analyses, and urban stormwater design. He has also authored magazine articles and short publications related to the application of transactional due diligence within the real estate market, emerging regulatory trends and standards development, and the key elements of successful stormwater management for land development projects.

Mr. Coyne is an Adjunct Professor in Villanova University's Department of Geography and The Environment. Mr. Coyne is also the Creator, Host and Writer of the *Environmental Experts Radio* Podcast, and has been a contributor to The Zweig Letter, authoring articles on technical and business operations within the architecture, engineering and construction (AEC) industry. Mr. Coyne is also a contributor to *Hidden City Philadelphia*, authoring stories of lesser-known landmarks significant to the history of the City of Philadelphia.

Credentials

Institute of Professional Environmental Practice (IPEP) Qualified Environmental Professional (QEP)

M.S. Water Resources and Environmental Engineering, Villanova University (2000)

Post-Graduate Certificate, Urban Water Resource Design, Villanova University (2001)

B.A. Earth/Environmental Science, Boston University (1992)

Training and Associations

American Society for Testing and Materials (ASTM) Member, Committee E50 (Environmental Assessments)

Associate Member, American Society of Civil Engineers (ASCE)

Former Board Member, Schuylkill River Greenway Association (SRGA)

OSHA 40-Hour Hazwoper and Worker Supervisory Training

Media

Creator, Host and Writer, *Environmental Experts Radio* Podcast 2018-Present

Writer, *The Zweig Letter* 2017-2020 (www.zweiggroup.com)

Contributing Writer, *Hidden City Philadelphia* (www.hiddencityphila.org)

Key Projects

Real Estate and Transactional Due Diligence

Key client manager and project leader for environmental consulting, advisory and due diligence services for several major eastern US lending institutions, commercial and residential developers, investment trusts, and civil engineering firms. Services include ESAs and other due diligence assessments, soil and groundwater investigations, specialized technical or regulatory reviews, land development feasibility studies, and other advisory services real estate decision making. Performed or managed over 1,000 Phase I assessments, real estate transaction screens, and preliminary assessments at commercial, residential, and industrial facilities, and development tracts throughout the eastern United States.

Hospital Complex Portfolios, Philadelphia, Pennsylvania*:* Managed and supervised the comprehensive environmental assessment process for two separate health care system acquisitions spanning two years, which involved a total of 12 hospital complexes and 35 separate professional health care properties. Subsequent to the environmental assessment tasks, evaluations of site impacts and potential exposure pathways were performed through targeted site investigations. The findings of Liberty's studies were incorporated into a schedule of environmental conditions within an asset purchase agreement totaling over e acquisition agreements, which involved over $100 million in asset transfers.

Former Industrial Protective Wear Manufacturer, Warrington, Pennsylvania: Designed and executed a comprehensive soil and groundwater investigation at the subject property on behalf of a prospective purchaser, to further evaluate a potential on-site source of chlorinated solvent impacts. The work uncovered a previously unidentified on-site source of groundwater impact and a complex soil-to-groundwater transport mechanism below the site. These observations resulted in the seller's agreement to remediate the site to Act 2 Standards as part of the purchase agreement.

Motel Complex, West Reading, Pennsylvania: Managed and performed due diligence ESA and Phase II site investigations at a motel complex slated for redevelopment by the County of Berks. Work included evaluation of options for the demolition of existing structures, asbestos-containing materials management, waste materials characterization and placement of on-site fill material. Outcomes of the project also included considerations of remedial options under Pennsylvania's Act 2 (Land Recycling Program) for various site re-use options.

Mushroom Production Facilities, Temple, Pennsylvania: Managed and performed environmental site assessments and subsequent site investigation activities at seven mushroom production facilities on behalf of a prospective purchaser of the site. The tasks included the removal of several USTs and

associated subsurface assessments, as well as investigative tasks. The findings of the assessments were used to develop various remedial strategies and associated cost estimates.

Former Vacuum Pump Manufacturing Complex, City of Philadelphia, Pennsylvania: Performed a comprehensive series of due diligence evaluations at a vacant, 200,000-square foot former vacuum pump manufacturing complex on behalf of a prospective purchaser, which planned the site for re-use as an industrial assembly facility. The evaluations included standard ASTM-defined Phase I ESA tasks, as well as additional planning and evaluation activities including Act 2 planning and remedial scope reviews.

Farm Dump Investigation and Removal, Coopersburg, Pennsylvania: Planned, coordinated and executed studies of a 600-ton (250-cubic yard) dump site in an abandoned quarry pit at a farm tract proposed for residential development. The investigation of the dump included the evaluation of naturally-occurring, elevated arsenic concentrations in weathered bedrock. The project culminated in the excavation and removal of the deposited debris, which included coordination with DEP and permitted disposal facilities, segregation of materials, and proper disposal of three separate waste steams.

Bank Branch Acquisitions, 84 Sites, Pennsylvania and New Jersey: Managed a series of due diligence assessments and follow-up site investigations at a set of bank properties in ten Pennsylvania and New Jersey counties surrounding Philadelphia. The properties were evaluated on behalf of a prospective purchaser of the sites as a single portfolio, resulting from the merger of two large Eastern US lending institutions. Additional due diligence evaluations subsequent to the initial assessments included asbestos surveys and soil and groundwater investigations.

Planned Golf Course and Residential Development, Lederach, Pennsylvania: Managed due diligence site assessments and site investigation activities for a set of five agricultural parcels totaling approximately 500 acres, which were planned for a golf course and residential development complex. Project tasks included Phase I environmental site assessments with subsequent ESA and parcel add-on assessments as well as soil and groundwater investigations at identified potential areas of concern, including agricultural chemicals application, farm dumps, and underground storage tanks (USTs).

Industrial Waste Landfill, Quakertown, Pennsylvania: Performed a Phase I environmental site assessment that resulted in the identification of a previously-unidentified, large-volume industrial waste landfill within a wooded area on an active farm property. The operation had been suspected and searched for by EPA and DEP officials based on anecdotal evidence in prior years but had not been previously located or investigated. The assessment was performed on behalf of a prospective purchaser, which used the newly discovered information to exercise its termination clause in the agreement of sale. Subsequent studies by the EPA have resulted in the designation of this facility as a National Priority List (NPL) site.

Agricultural Soils Evaluations, Various Counties, Pennsylvania: Designed and performed a cost-effective screening evaluation for the presence of residual concentrations of agricultural chemicals in shallow soils at farm and orchard tracts in several Pennsylvania counties, including Chester, Bucks, Montgomery, Berks, Lancaster, Lehigh, Northampton, Schuylkill, Franklin, and York. The investigations were performed in conjunction with other real estate due diligence activities at farm

tracts planned for residential development. At certain sites, the screening investigations were followed by comprehensive, vertical delineations of specific agricultural contaminants (arsenic, lead, and specific organochlorine pesticides and chlorinated herbicide compounds).

Former Glass Manufacturing Complex, Glassboro, New Jersey: Managed and completed a comprehensive Phase I assessment for a large former glass manufacturing complex undergoing planned industrial redevelopment. Performed additional assessment services pertaining to former and ongoing remedial activities as part of New Jersey's ISRA program requirements.

Development-Phase or Industrial Compliance and Permitting

Wetlands and Stream Mitigation Area Monitoring, Berks Park 78 Project, Bethel Township, Berks County, Pennsylvania: Liberty was retained to perform the mitigation area monitoring tasks for compensatory wetland and stream mitigation tasks required as part of the approved DEP/USACE Joint Permit at the Berks Park 78 development tract. The compensatory and mitigation activities included the restoration of previously-drained wetlands and reconstruction of stream channels had been impounded by farm ponds. Liberty supervised and monitored the mitigation activities during the entire period of construction, and remains responsible for monitoring and DEP/USACE reporting of the mitigation conditions on a semiannual and annual basis. The scope of work has also included the completion of a post-construction as-built report, regular agency correspondence and project updates to DEP and USACE on behalf of the project's general contractor and the county's Industrial Development Authority.

Automobile Manufacturer, Spring Hill, Tennessee: Conducted studies, regulatory reviews, calculations and reports as part of a Combined Wastestream Formula (CWF) Technical Reporting Package at a major automobile manufacturing and assembly plant. The project included the determination of the regulatory applicability for various process-related wastestreams, and the categorical limits defined by 40 CFR Parts 431 though 438. New effluent limits for several permitted wastestreams were established as a result of the CWF calculations.

Office Products Manufacturing Facilities, Southern and Eastern U.S: Reviewed and evaluated environmental management and compliance data for a chain of seven manufacturing facilities located in the southern and eastern United States (Kentucky, Texas, South Carolina, North Carolina and Oklahoma). Reviews included auditing of each facility's complete environmental management systems, record-keeping practices, permit conditions, and compliance status. The audit was used in concert with a series of environmental due diligence projects for the facilities prior to a divestment of assets that included the manufacturing facilities.

Electronics and Precision Machine Manufacturing Facility, Allentown, Pennsylvania: Responsible for industrial wastewater permitting and compliance services for a manufacturer of precision mail sorting machines for four years as an ongoing project. Compliance services have included reviewed and coordination of sanitary sewer pretreatment permit documents, preparation of Spill Prevention and Control Plans and Toxics Management Plans, and other related services (client representation and advocacy) as part of Borough and State industrial permit compliance efforts.

Metal Products Manufacturer, West Chester, Pennsylvania: Responsible for a series of annual industrial compliance auditing and permitting tasks as part of federal and state reporting requirements.

Project tasks include stormwater management, sampling, reporting and permit inspections, and waste generation and materials inventory reporting tasks. Responsibilities have also included ongoing consultative auditing and general industrial permitting oversight.

Multiple Industrial Facilities, Eastern U.S.: Performed environmental compliance audits in concert with Environmental Site Assessments for due diligence purposes at more than 50 industrial facilities throughout the mid-Atlantic and northeastern U.S. Projects typically included a review and evaluation of facility permitting programs; internal environmental management (i.e. communication and training) systems; waste generation, tracking and removal systems; and specific reporting practices as they apply to local, state and federal regulatory requirements for each facility.

Site Investigation and Remediation

Performed comprehensive investigative and remedial services, including Pennsylvania Act 2 and New Jersey ISRA programs, at industrial and commercial properties throughout the Mid-Atlantic region. These included over 150 site investigations and cleanups at sites in connection with property transaction assessments, remedial investigations, and baseline/preliminary assessments throughout the northeastern United States, Puerto Rico, and the U.S. Virgin Islands. Managed multi-phase remedial programs and monitoring programs for a large-scale petrochemical contract involving over 50 facilities in the mid-Atlantic U.S. region.

Gasoline Station and Convenience Market, City of Reading, Pennsylvania: Designed and constructed a high-vacuum, high-volume soil vapor extraction (SVE) system at an active gasoline station with gasoline impacts affecting soils within the unsaturated zone. The treatment system was designed to remediate soils within two discrete zones of impact (shallow and deep), with design elements which allowed for isolated treatment both vertically and horizontally within each zone. The system construction included the required permitting, zoning approvals, electrical and other infrastructure improvements.

PennDOT Bridge Cleanup Site, Upper Saucon Township, Lehigh County, Pennsylvania: As a PennDOT Qualified Consultant and Team Member for a District 5 Services Agreement, prepared a set of specifications for the characterization, removal and off-site disposal of two primary waste streams at an accident site on I-78 that had caused structural damage to a bridge overpass. Project work included detailed guidance for management of diesel fuel-impacted solid wastes and pressure cleaning washwaters in accordance with PennDOT guidance, DEP Waste Management Regulations, and other applicable statues and policies. Liberty's specifications were used to plan and guide repair work performed at the site in July 2015.

Wire Manufacturing Facilities, Plainfield and Piscataway, New Jersey: Conducted Preliminary Assessments (PAs) and Site Investigations (SIs) at two active wire plating facilities as part of planned facility closures, in accordance with New Jersey ISRA program requirements. Projects included identification of areas of concern, subsequent site investigation of potential subsurface chemical impacts, and PA/SI reporting under ISRA.

Former Scrap Metal Recycling Yard, Trenton, New Jersey: Conducted a comprehensive Remedial Investigation and Remedial Action at a former recycling yard planned for redevelopment, under the New Jersey Voluntary Cleanup Program. Project activities included delineation of metals and volatile

organics impact to soils, as well as excavation of areas of impacted material, subsurface piping, and buried demolition debris. Project resulted in the determination of "No Further Action" from the NJDEP, which allowed for the sale of the property.

UST/AST System Projects, Multiple Sites: Managed more than 25 underground and aboveground storage tank (UST and AST) system removal projects, including regulatory compliance monitoring and reporting.

Chlorinated Solvent Impact Site, West Springfield, Massachusetts: Managed remedial system design, construction and operation at a former dry cleaning facility where chlorinated solvent impact to groundwater had occurred. System components included soil vapor extraction of chlorinated solvents in soil and groundwater resulting from prior dry cleaning operations. Also, performed remedial system operations and upgrades, installed deep bedrock wells for expanded groundwater delineation, and provided oversight of indoor air monitoring of nearby structures and risk-based attenuation estimation.

Multiple Development Tracts, Chester, Bucks, Berks and Montgomery Counties, PA: Performed and managed several test pit and soil boring investigations of potential or suspected areas of waste deposition, hydrocarbon impact, chemical storage, and other potential issues of concern at multiple planned development sites. Performed services as part of additional investigation requirements stemming from prior initial Phase I assessments.

Former Aggregate Processing Site, Fort Washington, Pennsylvania: Managed a Pennsylvania Land Recycling Program (Act 2) project for a former industrial site planned for multi-use redevelopment as a regional rail parking facility and commercial complex. The project included the oversight of UST system removals and impact investigations, impacted soil removals, comprehensive soil and groundwater site investigations, and demonstration of attainment under regulatory program guidelines. Project work resulted in the receipt of an Act 2 Release of Liability for the site.

Former Service Station/Retail Gasoline Facility and Adjacent Properties, St. Thomas, U.S. Virgin Islands: Planned and conducted multiple phases of field investigation activities for potentially responsible parties (PRPs) associated with an EPA-mandated regional aquifer investigation involving chlorinated solvent impact to groundwater. Performed bedrock coring and well installation, aquifer testing, comprehensive groundwater monitoring program, UST system removals, and remedial design.

Airport Bulk Fuel Terminal, San Juan, Puerto Rico: Planned and conducted field soil and groundwater impact investigation activities as part of a multi-phase investigation associated with hydrocarbon impact. Installed temporary soil and groundwater monitoring points, and performed soil sampling, field screening, and well-point aquifer testing.

Chemical Manufacturing Lagoon Site, Ambler, Pennsylvania: Managed and conducted a soil and groundwater assessment on a site associated with suspected chemical impact from an adjacent pesticide/herbicide manufacturing plant. Identified potential impact pathways and issues of concern, and conducted a comprehensive soil investigation with analysis for multiple chemical parameters, identified and installed groundwater monitoring wells, and coordinated and communicated with local community organizations.

Former Railcar Manufacturing Complex, Wilmington, Delaware: Managed and completed a comprehensive soil and groundwater investigation and remediation project at a former railcar manufacturing facility located within a waterfront industrial area. Scope of work included expanded Phase I assessments, a comprehensive Phase II soil and groundwater investigation, and subsequent removal of hydrocarbon-impacted soils from the site.

Former Commercial Dairy and Farm Complex, Montgomeryville, PA: Managed and completed a multiple-phase assessment and remedial project at a 180-acre former dairy farm complex planned for commercial and residential development. Performed multiple stages of assessment reporting for lending purposes, identified areas of concern, oversaw removal of UST systems and subsequent soil remediation, groundwater well installation, soil bioremediation, and the removal of a 2,000-cubic yard farm dump.

Stormwater Design and Surface Water Modeling

Golf Course Reservoir, Upper Dublin, Pennsylvania: Conducted an evaluation of the flood flow in the event of a theoretical failure of a 5-acre reservoir located on a golf course, directly upstream of several dozen new residences. The project was completed as part of a hazard evaluation on behalf of the Upper Dublin Township and the PADEP, and involved the modeling of various breach scenarios and the downstream flow effects using numerical and computational methods, including the HEC-1 and HEC-RAS models. The results were presented to the PADEP and used to develop a plan for the removal of the reservoir through a controlled breach and streambank reconstruction.

Scouting Camp Dam Site, Pike County, PA: Conducted a Hazard Potential Evaluation on a 20-acre dammed lake. The project was conducted as part of the structures' permitting requirements under the PADEP Division of Dam Safety, on behalf of a large private institutional owner. The project included the delineation of the drainage area and the development of unit hydrographs to estimate typical and theoretical maximum precipitation inputs to the lake. Development of the watershed hydrological parameters included the use of the HEC-HMS modeling package. Using a series of precipitation events, theoretical breach scenarios were also modeled using the HEC-1 computational model to determine the downstream flooding effects of a dam break or overtopping under a range of conditions. The results were used to plan future dam improvements and management plans under the permitting program requirements.

Stormwater Infiltration Evaluations, Various Counties, Pennsylvania: Designed and managed in-situ, quantitative field testing for stormwater infiltration rates at commercial and residential development tracts in several Pennsylvania counties, including Chester, Montgomery, Berks, Schuylkill, and Delaware. Projects consisted of the measurement of vertical permeability at the location and depth of planned stormwater management features such as infiltration basins and subsurface seepage beds. Testing was performed in accordance with DEP's Stormwater Best Management Practices (BMP) Manual, and were incorporated into stormwater management designs for each facility.

Vacant Farm Tracts, Chester and Bucks Counties, Pennsylvania: Designed and managed field evaluations of soil suitability for wastewater application at several farm tracts in Chester and Bucks counties, planned for residential development. Project work included on-site field screening for general soil suitability, limiting zones, bedrock depth, and water table conditions. Testing was

performed in accordance with DEP's Chapter 73 requirements for on-lot sewage systems, and the results of the evaluations were included in the due diligence planning for sewerage feasibility at each site.

Materials Recycling Facility, Hamburg, Pennsylvania: Managed a sewer connection feasibility evaluation and preliminary design project for a recycling client as part of a plan to phase out an on-site sanitary septic system and to eliminate the need for containerization and off-site disposal of collected wash waters. Project tasks include the evaluation of various public sewer tie-in configurations and associated costs, regulatory reviews and local municipal authority coordination, and the development of preliminary designs for on-site pretreatment and lateral tie-ins with existing infrastructure.

Expert Witness and Litigation Support

Gasoline Impacts, Residential Development Tract, St. Louis County, Missouri: Provided Expert Witness review, evaluation, summary letters and pre-trial testimony on behalf of plaintiff's counsel for a matter involving the discovery of gasoline-contaminated soil at a residential development tract during construction. Work involved evaluation of environmental site assessment procedures and adherence to current industry standards (ASTM Standard Practice E1527-13), and discussions of likely contaminant sources, in support of mediation and/or trial in late 2019.

Arsenic Impacts, Former Commercial Greenhouse, Chester County, Pennsylvania: Performed site characterizations and subsequent litigation support in the form of expert services on behalf of plaintiff and counsel for a matter involving arsenic impacts at a former commercial greenhouse planned for residential development. Work involved reviews of prior environmental investigations, analysis of arsenic impact patterns, evaluation of remedial alternatives and associated costs in preparation for trial action in late 2019.

Publications and Presentations

Media Productions, 2018-2021:

Environmental Experts Radio Podcast (Creator, Host and Writer)
Media Outlets: Apple Podcasts, Spotify, iHeartRadio, Himalaya, All Podcast Aggregator Applications
Libsyn URL: *https://environmentalexpertsradio.libsyn.com*

Web and Printed Publications, 1999-2021:

- Catalyst Magazine, Spring 2015; One Size Doesn't Fit All: Evaluating Alternate Forms of Environmental Due Diligence

Web Articles for Liberty Environmental, Inc. (www.libertyenviro.com):

- Information Overload! Why the Definition of 'Reasonably Ascertainable' is Changing Rapidly in Due Diligence
- Do You Like a Good Story? Tackling the Unknowns in Environmental Assessments
- Digging Up The Past: What Truly Defines a Historical Recognized Environmental Condition?
- Running the Environmental Gauntlet: Can Your Site Emerge from the Government-Guaranteed Lending Review Process?
- Recent City of Philadelphia Contractor Safety Requirements: Can They Affect Environmental Projects?

- The Value of Going It Alone in Assessment Reconnaissance
- Sizing Up The Impacts: Pennsylvania's New Aquatic Resource Compensation Protocol
- Sources of Public Funds for Environmental Assessments and Cleanups
- Environmental Insurance Products vs. Traditional, Professional Due Diligence
- Waste Management Issues and Phase I ESAs
- Phase I Updates As Valuable but Inexpensive Refinancing Tools
- Addressing Agricultural Chemicals in Property Assessments

Web Articles for The Zweig Letter (www.zweiggroup.com):

- February 2019, 'The Business of Burgers: Lessons The AEC Industry Can Learn from Fast Food'
- May 2019, 'Growing Apart Together: How the Future AEC Workspace will be Flexible, but More Connected Than Ever'
- October 2019, 'The Delicate Art of Managing Expectations'

Web Articles in Hidden City Philadelphia (www.hiddencityphila.org):

- January 2018, 'The Vanishing of Northeast Village'
- May 2018, 'Take Me Up to the Ballgame: Rediscovering the Bleacher Houses of North 20th Street'

Courses, Presentations and Lectures, 2016-2023

- *Applied Environmental Science*, Villanova University Department of Geography and The Environment Course GEV 4350-8003; Course Creator and Adjunct Professor; Fall 2022-Present
- *Environmental Project Management*, Villanova University Department of Geography and The Environment Course GEV 4350-7250; Course Creator and Adjunct Professor; Spring 2023-Present
- *Introduction to Environmental Sustainability Studies*, Villanova University Department of Geography and The Environment Course GEV 3001; Adjunct Professor; Fall 2021-Spring 2022
- *PFAS: The History and Environmental Impacts of an Emerging Contaminant Class*; Villanova University Department of Geography and the Environment Colloquium Series, Villanova University, June 2021
- *Integrated Environmental Planning for the New Decade,* Pennsylvania Association of Environmental Professionals (PAEP) 2020 Annual Conference, October 2020
- *Changes in Environmental Assessment for Pennsylvania Chapter 105 Waterways Permitting*, Pennsylvania Association of Environmental Professionals (PAEP) 2018 Annual Conference
- *The Science of Stormwater*, Stormwater Management 2016, American Institute of Architects (AIA) Continuing Education System (CES) Seminar
- *Technical and Professional Writing*, Guest Lecture, Penn State Berks Professional Writing Program 2017-2018
- *Selling in a Knowledge Economy*, Guest Lecture, Drexel University 2016-2017

Project Scientist II

Qualifications Summary:

- *Preparation of PADEP Act 2 Reports*
- *Completion of Regulated UST and AST Closures*
- *Completion of associated field work for PADEP and NYCOER submittals*
- *Experienced in impacted soil identification and sampling techniques.*
- *Experienced in groundwater monitoring well installations and various groundwater sampling techniques.*
- *Experienced in aquifer testing methods and evaluation using Aqtesolv software.*
- *Performance of Phase II Site Investigation Field Services*
- *Experienced in Phase II Endangered Bog Turtle Identification Surveys*
- *Experienced with installation and maintenance of remedial systems.*
- *Technical experience with ArcGIS products, Microsoft Office Suite, Surfer, AutoCAD*

Fields of Competence

Mr. Yekel is a geologist and GIS/CAD technician with 5 years of experience in environmental consulting. His responsibilities include preliminary assessments, site characterization activities, remedial design, remediation, underground and aboveground storage tank closures, and various other geologic evaluations. As a GIS/CAD technician, he has produced maps, figures, and graphics for multiple large regulatory submittals to the PADEP and NYCOER. His GIS and CAD work has supported Liberty's site characterization, remediation, and regulatory compliance groups.

Credentials

Bachelor of Science, Geoscience - Geology Track, West Chester University (2019)
Bachelor of Art, Geography - Geographic Information Systems, West Chester University (2019)

Training and Associations

OSHA HAZWOPER 40-Hour Certification, PA (2023)
OSHA 30-Hour Construction Training, NY (2019)

Key Projects

Site Characterization and Remediation

PFAS Investigation
Dye and Bleach Textile Facility, Shoemakersville, Berks County, PA;
Served as the lead project scientist for the investigation of PFAS impacted process wells located at an active textile facility. Project included installation of monitoring wells and collection of soil and groundwater samples to analyze for the emerging contaminate, PFAS. He led the research and implementation of PFAS-free procedures to install monitoring wells, collect soil and collect groundwater samples for the project.

Project Scientist II

Petroleum Site Characterization
Former AST Bulk Fuel Facility, Manheim Township, Lancaster County, PA;
Following removal of multiple large ASTs, served as the lead project scientist to characterize impacts discovered during the AST removal. Tasks included monitoring well installation and sampling, soil screening, logging, and sampling, waste disposal, SPL removal and reporting. As a part of the reporting for this site, a non-use aquifer request was submitted to the DEP, which involved conducting a door-to-door survey of surrounding parcels and review of property records to determine water use.

Historic Fill Delineation,
Former Chocolate Factory, Lititz Borough, Lancaster County, PA;
Served as the lead project scientist to delineate the extent of historic fill surrounding a former rail spur at a former chocolate factory. The site was subdivided and redeveloped into multiple residential condominiums. Tasks included soil screening and logging, soil sampling, clean fill testing and SPLP testing.

Former Bulk Fuel Facility
Fawn Grove, York County, PA
Serving as the lead project scientist for a former bulk fueling facility in York County, PA. Impacts from the former fueling facility have impacted multiple nearby residential drinking water wells. Tasks include scheduling and coordination of multiple different residential properties to perform quarterly monitoring well and drinking water well sampling and point-of-entry-treatment system maintenance. Also completes the quarterly reporting to the DEP and quarterly letter updates to the impacted property owners.

Former Gas Station and Convenience Store
Dover Township, York County, PA;
Serving as the lead project scientist for an active site remediation project at a former gas station in York County PA. Tasks include scheduling and performing quarterly groundwater monitoring and sampling, quarterly progress report preparation, aquifer testing and evaluation, and remedial actions, such as excavations and chemical injections.

Former Gas and Service Station
Covington Township, Lackawanna County, PA
Serving as the lead project scientist for an active site remediation project at a former gas station in Lackawanna County PA. Tasks include scheduling and performing quarterly monitoring well and drinking water well sampling, point-of-entry-treatment system maintenance, and quarterly reporting.

Residential Heating Oil Release
Cumuru Township, Berks County, PA
Assisted with the installation of a pneumatic operated separate phase layer recovery system to extract No. 2 Fuel Oil from monitoring wells at a residential property that was released during an underground tank removal. Tasks include system maintenance and monitoring, SPL recovery, quarterly groundwater sampling and waste disposal coordination. Also assisted in preparation of the remedial investigation report, clean-up plan and final report.

Project Scientist II

Former Industrial Textile Cleaner
New Rochelle, New York, NY:
Assisted with the installation of an active sub-slab depressurization system in the basement of a former industrial cleaner due to above NYSDOH standard levels of indoor air contaminants. Oversaw soil and concrete excavation and the installation of vapor pits, as well as aided in the installation of a vapor extraction fan to remove vapors from site and collect air samples once the system was installed.

Former Industrial Paint Manufacturer
City of Reading, Berks County, PA;
Assisted with the site characterization and remediation of a large brownfield site in Reading, PA. Tasks included soil screening, logging, and sampling, deep bedrock monitoring well installation, groundwater sampling and soil vapor extraction well installation.

Historic Fill Delineation Dump Site
Farmers Market, Ontelaunee Township, Berks County, PA;
Served as the lead project scientist to delineate the extent of historic fill at a farmers' market in Berks County PA. Also assisted in determining the extent of the hard cap to be installed over the historic fill materials.

Clean Fill Testing and Determination
Former Asphalt Plant, Lancaster, Lancaster County, PA;
Completed clean fill testing for a construction firm to determine if soils can be reused as clean fill in accordance with PADEP's fill policy. Tasks including the advancement of test pits, soil sampling and screening, and mapping and reporting of results.

PA Storage Tank Cleanup Program

AST Closures & Reporting Services
Former Bulk Fuel Facility, Manheim Township, Lancaster County, PA;
Served as the lead project scientist for the removal of multiple large ASTs at a former bulk fueling facility in Lancaster County, PA. Tasks included observation and documentation of tank removal activities, soil screening, sampling, well installations, groundwater sampling and associated field work to complete an AST Closure report to submit to the PADEP. Following removal of ASTs, site characterization occurred to delineate and observe impacts related to the former ASTs.

UST Closure and Reporting Services
Historic Residential Condos, Lancaster, Lancaster County, PA:
Served as the lead project scientist for the removal of one regulated and one unregulated underground storage tank at a historic residential property near Lancaster City. Completed the soil screening, sampling, report, and necessary documentation to prepare a submittal to the PADEP.

Project Scientist II

Other Environmental Projects

SSDS and SVE Remediation Design
Borough of Queens, New York, NY;
Aided professional engineers and professional geologists to design and implement a sub-slab depressurization system and soil vapor extraction system for a multi-story condominium building in New York City. Primary tasks include CAD and GIS drafting and correspondence with on-site personnel to collect measurements and details for the plan sheets.

Stormwater Basin, Remedial Wetland Design
Mulch/Landscape Products Facility, East Drumore Township, Lancaster County, PA;
Aided professional engineers and wetland professionals to design a remedial wetland for a stormwater retention basin at a mulch facility in Lancaster County. Primary tasks included CAD and GIS drafting based on surveyed measurements collected in the field.

Former Warehouse Phase II
Swatara Township, Dauphin County, PA;
Conducted a Phase II investigation at a former warehouse near Harrisburg PA. Tasks included soil logging, screening, and sampling, installation of temporary wells and reporting.

Regulated Waters Delineation
Proposed Warehouse Project, Dauphin County, PA: Aided a 3-person team to delineate wetlands and watercourses on a 250-acre site, containing 28 wetlands and 17 watercourses. The project is currently in the design phase and will be developed into a warehouse and logistics center.