SITE MANAGEMENT PLAN

for

45 COMMERCIAL STREET
BROOKLYN, NY 11222
NYSDEC BCP Site No. C224304

Prepared for:

H1H2 Owner LLC
535 Madison Avenue
New York, NY 10022

Prepared by:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision(s)	NYSDEC Approval Date

November 14, 2022
Langan Project No. 170229024

LANGAN

CERTIFICATION STATEMENT

I, Jason J. Hayes, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statues and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

SIGNATURE

11/10/2022
DATE

STATE OF NEW YORK
JASON JAMES HAYES
089491
LICENSED PROFESSIONAL ENGINEER
11/10

Jason J. Hayes, P.E.
NYS P.E. # 089491

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

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LIST OF ACRONYMS AND ABBREVIATIONS

AGV	Air Guideline Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BGS	Below grade surface
CAMP	Community Air Monitoring Plan
Cfm	Cubic feet per minute
CFR	Code of Federal Regulation
CHASP	Construction Health and Safety Plan
CMWP	Corrective Measures Work Plan
COC	Certificate of Completion
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
EE	Environmental Easement
el	Elevation
ESA	Environmental Site Assessment
EWP	Excavation Work Plan
FEMA	Federal Emergency Management Agency
HDPE	High-density polyethylene
HREC	Historical Recognized Environmental Condition
HVAC	Heating, ventilation, and air conditioning
IC	Institutional Control
µg/m3	Micrograms per cubic meter
NAVD88	North American Vertical Datum of 1988
NYCDOHMH	New York City Department of Health and Mental Hygiene
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OWS	Oil-water Separator
P.E. or PE	Professional Engineer
PBS	Petroleum Bulk Storage
PCE	Tetrachloroethene
PGW	Protection of Groundwater
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act

RE	Remedial Engineer
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIR	Remedial Investigation Report
RSO	Remedial System Optimization
RRU	Restricted Residential Use
SCG	Standards, Criteria and Guidelines
SCL	Soil Cleanup Level
SCO	Soil Cleanup Objective
SGV	Standards and Guidance Values
SMD	Submembrane Depressurization
SMP	Site Management Plan
SOE	Support of Excavation
SVOC	Semivolatile Organic Compound
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leachate Procedure
TOGS	Technical and Operational Series
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

GPL Development LLC, H Owner LLC, Greenpoint Landing Developers LLC, Greenpoint Storage Terminal LLC, and Greenpoint Landing Associates, L.L.C. entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on April 17, 2020 (Brownfield Cleanup Program [BCP] Site No. C224304) to investigate and remediate the 44,600-square-foot (±1.02 acre) site located at 45 Commercial Street (Brooklyn Tax Block 2472, Lot 70) in Brooklyn, New York (the site). On June 11, 2021, a BCA amendment was executed by the NYSDEC to add H1H2 Owner LLC, H1H2 GPL Owner LLC, and H1H2 Retail LLC as Volunteers. On July 18, 2022, a second BCA amendment was executed by the NYSDEC to reflect the transfer of site ownership in which HP H1H2 Housing Development Fund Company, Inc., became the nominal fee owner of the site and H1H2 Owner LLC became the equitable and beneficial owner of the site. On October 28, 2022, a third BCA amendment was executed by the NYSDEC to grant tangible property tax credit based upon the site's proposed redevelopment to 100% affordable housing.

The following provides a summary of the institutional and engineering controls required for the site, as well as the inspections, monitoring, maintenance, and reporting activities required by this Site Management Plan (SMP):

Site Identification	BCP Site No. C224304 45 Commercial Street, Brooklyn, New York
Institutional and Engineering Control Summary	
Institutional Controls:	• The property may be used for restricted-residential, commercial, and industrial use as defined in Part 375-1.8(g)
	• All Engineering Controls must be operated and maintained as specified in this SMP
	• All Engineering Controls must be inspected at a frequency and in a manner defined in this SMP
	• The use of groundwater underlying the site is prohibited without the necessary water quality treatment as determined by the New York State Department of Health and/or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the NYSDEC
	• Groundwater and other environmental or public health monitoring must be performed as defined in this SMP
	• Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP
	• All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP
	• Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP

Site Identification	BCP Site No. C224304 45 Commercial Street, Brooklyn, New York
Institutional Controls:	• Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP
	• Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement
	• The potential for vapor intrusion must be evaluated for any future buildings developed in the area within the IC boundary shown on figure 4 and any potential impacts that are identified must be monitored or mitigated
	• Vegetable gardens and farming in remaining soil on the site are prohibited
	• An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible
Engineering Controls:	• Site Cover System
	• Active Sub-Membrane Depressurization (SMD) System with waterproofing/vapor barrier

Inspection, Monitoring, Maintenance, and Reporting Schedule	
Inspections:	**Frequency:**
• Site Cover System	Annually
• SMD System	Annually
Monitoring:	**Frequency:**
• SMD System Vacuum Monitoring Points	Annually
Maintenance:	**Frequency:**
• Site Cover System	As Needed
• SMD System	As Needed
Reporting:	**Frequency:**
• Periodic Review Report (including sampling data)	Annually

Detailed descriptions of the above requirements are provided in this SMP.

1.0 INTRODUCTION

1.1 GENERAL

This Site Management Plan (SMP) is a required element of the remedial program for the property located at 45 Commercial Street, Brooklyn, New York (hereinafter referred to as the site). The site is enrolled in the New York State (NYS) Brownfield Cleanup Program (BCP) (BCP Site No. C224304), which is administered by the New York State Department of Environmental Conservation (NYSDEC).

GPL Development LLC, H Owner LLC, Greenpoint Landing Developers LLC, Greenpoint Storage Terminal LLC, and Greenpoint Landing Associates, L.L.C. (the "Volunteers") entered into a Brownfield Cleanup Agreement (BCA) on April 17, 2020 with the NYSDEC to investigate and remediate the 44,599-square-foot site during redevelopment. On June 11, 2021, a BCA amendment was executed to add H1H2 Owner LLC, H1H2 GPL Owner LLC, and H1H2 Retail LLC as Volunteers. On July 18, 2022, a second BCA amendment was executed to reflect the transfer of site ownership. HP H1H2 Housing Development Fund Company, Inc., became the nominal fee owner of the site and H1H2 Owner LLC became the equitable and beneficial owner of the site. On October 28, 2022, a third BCA amendment was executed to grant tangible property tax credit based upon the site's proposed redevelopment to 100% affordable housing.

After the remedy described in the March 22, 2021 Remedial Action Work Plan (RAWP) was completed and a Track 4 cleanup was achieved, contamination was left in the subsurface (herein referred to as remaining contamination). Institutional Controls (ICs) and Engineering Controls (ECs) were incorporated into the site remedy to control exposure to remaining contamination and to protect public health and the environment. An Environmental Easement (Appendix A) granted to the NYSDEC, and recorded with the NYC Office of the City Register, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished, in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. This plan was approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP details the implementation procedures for ICs and ECs required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC). Failure to comply with this SMP is also a violation of the ECL, Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 375, and the BCA (Index No. C224304-03-20; Site No. C224304) for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix B.

This SMP was prepared by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan), on behalf of the Volunteers, in accordance with the requirements of NYSDEC DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 3, 2010, and guidelines provided by the NYSDEC. This SMP addresses the means for maintaining the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 REVISIONS

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. The NYSDEC can also make changes to the SMP or request revisions from the remedial party. Revisions will be necessary upon, but not limited to, the following:

1. A change in media monitoring requirements,
2. Upgrades to or shut-down of a remedial system,
3. Post-COC removal of remaining contamination, or
4. Other significant changes to the site conditions.

In accordance with the Environmental Easement, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is maintained in its files.

1.3 NOTIFICATIONS

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC DER-10 for the following reasons:

1. 60-day advance notice of any proposed changes in site use cited under the terms of the BCA, 6 NYCRR Part 375, and/or ECL.
2. 7-day advance notice of any field activity associated with the remedial program.
3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (EWP) (Appendix C). If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above-mentioned 60-day advance notice is also required.
4. Notice within 48-hours of any damage or defect to the foundation, structures, or EC(s) that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
5. Notice within 48 hours of any non-routine maintenance activities.

6. Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of ECs, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
7. Follow-up status reports describing and documenting actions taken to respond to any emergency event requiring ongoing responsive action and to restore the effectiveness of the ECs within 45 days.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

8. At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/remedial party has been provided with a copy of the BCA and all approved work plans and reports, including this SMP.
9. Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1.3 below includes contact information for the above notification. The information in this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

Table 1.3: NYSDEC Notification Contact Information*

Name	Contact Information	Required Notification**
Ruth Curley, NYSDEC Project Manager	Telephone: (518) 402-9480 Email: ruth.curley@dec.ny.gov	All Notifications
Douglas MacNeal, Regional Remediation Engineer	Telephone: (518) 402-9684 Email: douglas.macneal@dec.ny.gov	All Notifications
Kelly Lewandowski, Chief - Site Control Section	Telephone: (518) 402-9569 Email: Kelly.lewandowski@dec.ny.gov	Notifications 1 and 8
Eamonn O'Neil, New York State Department of Health (NYSDOH) Project Manager	Telephone: (518) 402-7877 Email: eamonn.oneil@health.ny.gov	Notifications 4, 6, and 7

* Notification contacts are subject to change and will be updated as necessary.

** Numbers in this column reference the numbered bullets in the notification list in this section.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 SITE LOCATION AND DESCRIPTION

The site is located at 45 Commercial Street in Brooklyn, New York (identified on the Brooklyn Borough Tax Map as Block 2472, Lot 70 and is about 44,600 square feet (±1.02 acres) in area. The site is bounded by a mixed-use residential and commercial building (1 Bell Slip a/k/a, Parcel H3) to the north; a NYC Transit Authority parking lot (65 Commercial Street) to the east; Commercial Street to the south; and Bell Slip (a private roadway) followed by two mixed-use residential and commercial buildings 37 Blue Slip (a/k/a, Parcel G1) and 21 Commercial Street (a/k/a, Parcel G2) to the west. The boundaries of the site are described in the metes and bounds site description provided in the Environmental Easement, which is included as Attachment A. A Site Location Map and Site Plan are included as Figures 1 and 2, respectively. The owner of the site parcel at the time of issuance of this SMP is H1H2 Owner LLC.

2.2 PHYSICAL SETTING

2.2.1 Land Use

The Site, when complete, will consist of a mixed-use residential and commercial building with) ground floor retail and residential units above... The site is in R6 and R8 residential districts with a partial C2-4 commercial use overlay. Mixed-use residential, commercial, and light industrial buildings characterize the surrounding area.

The following is a summary of the adjoining and surrounding properties:

Direction	Adjoining and Adjacent Properties			Surrounding Properties
	Block No.	Lot No.	Description	
North	2472	200 & 475	New 31-story mixed-use residential and commercial building (1 Bell Slip a/k/a Parcel H3)	Newtown Creek
East	2472	425	NYC Transit Authority Parking Lot, 65 Commercial Street	Vacant lot, mixed-use residential and commercial buildings, residential buildings
South	Commercial Street			Vacant lots, mixed-use residential and commercial buildings, industrial and manufacturing buildings

Direction	Adjoining and Adjacent Properties			Surrounding Properties
	Block No.	Lot No.	Description	
West	Bell Slip			Mixed-use residential and commercial buildings: 21 Commercial Street and 7 Bell Slip

2.2.2 Geology

According to United States Geological Survey (USGS) "Bedrock and Engineering Geology Maps of New York County, and parts of Kings and Queens Counties, New York, and parts of Bergen and Hudson Counties, New Jersey", bedrock stratigraphy in the area consists of Ravenswood Granodiorite and Hartland Formation. Ravenswood Granodiorite typically consists of medium- to dark-gray, sillimanite-garnet-pink microcline-plagioclase-biotite-muscovite-quartz and biotite-hornblende-orthoclase layered gneiss. The Hartland formation typically consists of gray sillimanite-garnet-microcline gneiss and fine-grained biotite-muscovite-quartz schist interlayered with quartz-plagioclase-muscovite pegmatite, hornblende amphibolite, and coarse granoblastic-textured amphibolite gneiss. Bedrock was not encountered during the investigation or previous environmental investigations conducted at the site; bedrock was also not encountered during below grade site development activities. Bedrock was encountered during a geotechnical investigation at the site at about 50 to 65 feet below grade surface (bgs).

Based on findings from the Remedial Investigation (RI), completed by Langan in May 2020, the subsurface profile generally consists of historic fill overlying light- to dark-gray clay with varying amounts of silt, peat, sand, and shells. Historic fill thickness was generally measured to vary between 13 and 20 feet. The fill generally consists of gray to black fine-grained sand with varying amounts of gravel, silt, clay, brick, concrete, glass, coal ash, slag, wood, and coal. These investigation findings were confirmed in the field during site remediation.

2.2.3 Hydrogeology

Based on data collected during the May 2020 RI, the depth-to-groundwater is between 8.55 and 10.54 feet bgs and flows to the west towards the confluence of Newtown Creek and the East River. Given the proximity of the site to the East River, groundwater is expected to experience some level of tidal influence; however, tidal influence was not studied or quantified as part of previous environmental investigations. Private and public water supply wells are not located in the vicinity of the site.

2.3 INVESTIGATION AND REMEDIATION HISTORY

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the site. Full titles for each of the reports referenced below are provided in Section 8.0 (References).

2.3.1 Site History

Coal and lumber storage were the primary uses of the site for more than 100 years from the late 1800s until about 1980, when the lumber yard operations were phased out and the owner (Lumber Exchange Terminal, Inc.) began to lease the site to tenants for heavy construction equipment, materials, and machinery storage. The site was most recently used as a staging area for construction trailers and equipment for the redevelopment of the adjoining Parcel H3. Prior to remediation, the site was covered by concrete and/or asphalt pavement and used for vehicle parking.

2.3.2 Previous Environmental Reports

The investigations listed below describe original site conditions prior to implementation of the remedy and were performed to characterize the nature and extent of contamination and to confirm environmental conditions and subsurface geology to develop remediation and mitigation strategies for the site.

1. *Phase I Environmental Site Assessment Report – Greenpoint Lumber Yard, Brooklyn, New York, prepared by AKRF, Inc. dated July 2001*
2. *Supplemental Subsurface (Phase II) Investigation Report – Greenpoint Lumber Yard, Brooklyn, New York, prepared by AKRF, Inc. dated April 2004*
3. *Remedial Investigation Report – Parcels D1, D2, E3, F, G, and H, prepared by Langan, dated May 19, 2014*
4. *Subsurface Investigation – 45 Commercial Street, performed by Langan, dated September 2019*
5. *Remedial Investigation Report – 45 Commercial Street, prepared by Langan, dated October 29, 2020*

Phase I Environmental Site Assessment Report – Greenpoint Lumber Yard, Brooklyn, New York, prepared by AKRF, Inc. (July 2001)

AKRF, Inc. was retained by Park Tower Realty Corporation to perform an Environmental Site Assessment (ESA) of a 21-acre former lumber yard (including lands underwater) in the Greenpoint neighborhood of Brooklyn, New York. The site is included in the upland acres that comprise the former lumber yard.

The Phase I ESA concluded that releases of petroleum or hazardous substances may be present on the former lumber yard (including the site) as the result of historical uses of the site and surrounding area. Several 55-gallon drums of lube oil and car maintenance activities (minor auto repairs, truck washing, and tire changes) were observed at the site during the site reconnaissance.

Supplemental Subsurface (Phase II) Investigation Report – Greenpoint Lumber Yard, Brooklyn, New York, prepared by AKRF, Inc. (April 2004)

This investigation included the completion of two soil borings and one groundwater monitoring well, and collection of four soil samples and one groundwater sample within the site boundary. Soil samples were analyzed for VOCs, SVOCs, polychlorinated biphenyls (PCB), pesticides, and target analyte list (TAL) metals. Groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals.

1. Historic fill was identified in both borings completed at the site and was composed of varying amounts of sand, silt, and gravel with brick, coal, concrete, slag, and wood. Historic fill was observed immediately below the asphalt and concrete cap to boring termination depths of about 10 to 15 feet bgs.
2. No VOCs exceeded the NYSDEC Unrestricted Use (UU) or Restricted Use Restricted-Residential (RURR) Soil Cleanup Objectives (SCO).
3. Seven SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and ideno(1,2-c,d)pyrene) exceeded the UU and/or RURR SCOs in soil. Total SVOCs were detected at a maximum concentration of 49.55 milligrams per kilogram (mg/kg). Total PCBs exceeded the UU SCO in a soil sample collected from the 0.5- to 2-foot interval in the northern part of the site. Two pesticides, 4,4'-DDD and 4,4'-DDE, exceeded the UU SCOs in soil samples collected from the 0.5- to 2-foot interval in the southern part of the site. Metals (including copper, lead, mercury, nickel, and/or zinc) exceeded the UU and/or RURR SCOs in all soil samples with the exception of one soil sample collected from the 8- to 9-foot interval in the northern part of the site. VOCs, SVOCs, PCBs, and pesticides were not detected in the groundwater sample collected from in the southern part of the site.
4. Three metals (iron, manganese, and sodium) exceeded the NYSDEC Standards and Guidance Values (SGV) for Class GA water at total and dissolved concentrations in the southern part of the site.

Remedial Investigation Report – Parcels D1, D2, E3, F, G, and H, Brooklyn, NY, prepared by Langan (May 19th, 2014)

This investigation was prepared in consultation with the OER to satisfy E-Designation requirements for six parcels of the Greenpoint Landing Development Property and included the completion of one soil boring and groundwater monitoring well and one soil vapor point, and collection of three soil samples, one groundwater sample, and one soil vapor sample in the eastern part of the site. Additional data were collected on other parcels that comprise the Greenpoint Landing development property. Soil samples were analyzed for VOCs, SVOCs, PCBs, pesticides, and TAL metals. Groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals.

Historic fill identified in the soil boring was composed of varying amounts of sand, silt, gravel, and clay with ash, coal, and concrete and was observed directly below the concrete cap to a depth of about 10 feet bgs. Historic fill was underlain by native soil composed of varying amounts of sand, silt, and clay to a boring termination depth of about 15 feet bgs.

1. No VOCs were detected above the UU or RURR SCOs. Eight SVOCs (3-methylphenol/4-methylphenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and/or ideno(1,2,3-cd)pyrene) exceeded the UU and/or RURR SCOs in one or more soil samples. Total SVOCs were detected at a maximum concentration of 219.16 mg/kg in a sample collected from the 0- to 2-foot interval. Five metals (arsenic, copper, lead, mercury, and zinc) exceeded the UU SCOs in one or more soil samples; lead also exceeded the RURR SCO in soil samples collected from the 3- to 5-foot depth interval. Pesticides and herbicides were not detected in soil samples.
2. VOCs and SVOCs were not detected above the NYSDEC SGVs. PCBs, pesticides, and herbicides were not detected in groundwater. Four metals (iron, magnesium, manganese, and sodium) exceeded the NYSDEC SGVs at total and dissolved concentrations.
3. Thirteen petroleum, ketone, and/or solvent-related VOCs (including 2,2,4-trimethylpentane, 2-butanone, acetone, benzene, carbon disulfide, chloromethane, cyclohexane, heptane, n-hexane, p- & m-xylene, propylene, toluene, and trichlorofluoromethane) were detected in soil vapor; however, no NYSDOH standards or guidance values exist for these compounds.
4. One soil vapor sample was evaluated using the NYSDOH Guidance for Evaluating Soil Vapor Intrusion. The NYSDOH Guidance document contains Decision Matrices that evaluate eight VOCs – carbon tetrachloride, TCE, cis-1,2-

dichloroethene, 1,1-dichloroethene, tetrachloroethene (PCE), 1,1,1-trichloroethane, methylene chloride, and vinyl chloride. None of the 8 VOCs were detected. The NYSDOH Guidance also include Air Guideline Values (AGV) for three VOCs (methylene chloride, PCE, and TCE); none of these compounds were detected in the soil vapor sample.

September 2019 Subsurface Investigation – 45 Commercial Street, performed by Langan

This investigation was performed on the site only (no other Greenpoint Landing development property) for the purpose of BCP eligibility, and included the completion of 15 soil borings and collection of 32 soil samples (including QA/QC samples). Soil samples were analyzed for VOCs, SVOCs, and TAL metals. NYSDEC Analytical Services Protocol (ASP) Category B deliverables were provided by Alpha Analytical, LLC, an Environmental Laboratory Approval Program (ELAP) certified laboratory. Analytical data was validated by a Langan validator in accordance with United States Environmental Protection Agency (USEPA) and NYSDEC validation protocols.

1. Historic fill identified in the soil borings was composed of varying amounts of sand, silt and gravel, with ash, asphalt, coal, concrete, wood, and slag and was observed directly below the concrete and asphalt cap to depths ranging from about 6 to 15 feet bgs (deepest soil boring termination depth). Native soil, composed of grayish brown to tan fine sand with trace silt, was encountered at depths between about 6 to 13.5 feet bgs in four of the twelve soil borings. Native soil was not encountered in eight soil borings.
2. Two VOCs (acetone and total xylenes) exceeded the UU but not the RURR SCOs in one or more soil samples.
3. Nine SVOCs (3- and 4-methylphenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene) exceeded the UU and/or RURR SCOs in one or more soil samples. With the exception of 3- and 4-methylphenol and naphthalene, all SVOCs were detected in at least one boring at concentrations exceeding the RURR SCOs.
4. Seven inorganics (including arsenic, trivalent chromium, copper, lead, mercury, nickel, and zinc) exceeded the UU and/or RURR SCOs in one or more soil samples. Of these inorganics, arsenic, copper, lead and mercury were detected at concentrations exceeding the RURR SCOs in one or more soil samples.
5. A spill was reported to NYSDEC (Spill No. 1906491) based on field observations and review of analytical data that identified staining, odors and photoionization

detector (PID) readings and the detection of petroleum related compounds (total xylenes and naphthalene) in soil.

2020 RIR – 45 Commercial Street, prepared by Langan (October 29, 2020)

The BCP Remedial Investigation (RI) included the completion of a geophysical survey and the advancement of 17 soil borings, installation of six permanent groundwater monitoring wells, and installation of five soil vapor points, and the collection of 38 soil samples, 8 groundwater samples, and 6 soil vapor samples (including QA/QC samples). NYSDEC Analytical Services Protocol (ASP) Category B deliverables were provided by Alpha Analytical, LLC, an Environmental Laboratory Approval Program (ELAP) certified laboratory. Analytical data was validated by a Langan validator in accordance with United States Environmental Protection Agency (USEPA) and NYSDEC validation protocols. Findings from the RIR are summarized as follows:

1. Stratigraphy: A historic fill layer was observed from surface grade to depths ranging from about 13 to 20 feet bgs (deepest sample collected), and consisted of gray to black fine-grained sand with varying amounts of gravel, silt, clay, brick, concrete, glass, coal ash, slag, wood, and coal. The fill layer is underlain by native soils consisting of light- to dark-gray clay with varying amounts of silt, peat, sand, and shells. Bedrock was not encountered during the RI or previous environmental investigation conducted at the site. Bedrock was encountered on the site during a geotechnical investigation at about 50 to 65 feet bgs.
2. Hydrogeology: Groundwater was observed at depths between 8.55 and 10.54 feet bgs with elevations ranging from el. 2.82 to 3.28 feet during synoptic groundwater level measurements collected from six wells during the RI. Groundwater was calculated to flow to the west towards the confluence of Newtown Creek and the East River.
3. Historic Fill Quality: Historic fill contains contaminants including SVOCs and metals above the UU and/or RURR SCOs, including hazardous concentrations of lead. The presence of these compounds in soil may be related to historic fill or to historical site uses as a lumber yard and for storage of treated wood.
4. Petroleum-Impacted Soil and Groundwater:
   a. Soil - Petroleum impacts, evidenced by odors, staining, PID readings above background levels, and/or analytical data, was identified in two soil borings above the groundwater table and in ten soil borings from below the groundwater table to a clay confining layer (about 12.5 and 18 feet bgs) in the northern part of the site.
   b. Groundwater - No petroleum-related VOCs were identified above SGVs in groundwater.

c. The residual petroleum contamination identified in the lower parts of the historic fill layer across about half of the site is attributed to a historic petroleum release and associated with Spill No. 1906491.

5. CVOCs in Groundwater - One detection of chlorinated VOC, 1,2-dichloroethane identified above SGVs may be related to the former NuHart Plastic Manufacturing Facility (State Superfund Site #224136).
6. Emerging Contaminants in Groundwater: Per- and Polyfluoroalkyl Substances (PFAS) in groundwater were detected above the guidance values set forth in the NYSDEC Part 375 Remedial Programs Guidelines for Sampling and Analysis of PFAS (June 2021). 1,4-dioxane was detected below the drinking water maximum contaminant level (MCL) 1,4-dioxane adopted by New York State for public water systems (July 2020). No source of PFAS or 1,4-dioxane was identified on site. The source of PFAS and 1,4-dioxane is unknown.
7. Soil Vapor Impacts: Petroleum-related and chlorinated VOCs were identified in soil vapor samples across the site. The source of petroleum-related VOCs may be related to an on-site source. The source of chlorinated VOCs may be related to the former NuHart Plastic Manufacturing Facility (State Superfund Site #224136).

2.4 REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAO) as listed in the Decision Document dated April 2021 are as follows:

Media	RAOs for Public Health	RAOs for Environmental Protection
Soil	• Prevent ingestion/direct contact with contaminated soil. • Prevent inhalation exposure to contaminants volatilizing from soil.	• Prevent migration of contaminants that would result in groundwater contamination.
Groundwater	• Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards. • Prevent contact with, or inhalation of volatiles, from contaminated groundwater.	• Remove the source of groundwater contamination.
Soil Vapor	• Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the site.	

2.5 REMAINING CONTAMINATION

2.5.1 Soil

Historic fill that was not removed during remedial excavation remains beneath the site cover system. Documentation endpoint soil samples indicate that remaining contamination consists of soil contaminated with SVOCs, inorganics/metals, and PFOA exceeding the Track 4 SCOs, which are listed in Table 1. Of the 65 documentation soil samples collected, 54 samples exhibit SVOCs and/or inorganics/metals at concentrations exceeding the Track 4 SCOs. The highest values include arsenic (82.5 mg/kg) at EP-05, lead (3,750 mg/kg) and barium (1,360 mg/kg) at EP-06, lead (1,820 mg/kg) at EP17, total SVOCs (652.16 mg/kg) at EP-28 (duplicate), lead (3,720 mg/kg) at EPSW01, and PFOA (0.00202 mg/kg) at EPSW10. Exposure to these materials is and will be prevented by the site cover system installed under the Track 4 cleanup (Section 3.3.1).

A summary of the analytical results for documentation soil samples is presented in Table 2. Analytical results for samples exceeding the Track 4 SCOs are presented in Table 3. Documentation soil sample locations are shown on Figure 3.

2.5.2 Groundwater

Groundwater sampling results from the RI performed prior to implementation of the RAWP indicated the presence of VOCs and total and dissolved metals in site groundwater. PFAS were also detected above the June 2021 NYSDEC PFAS Guidance Values. Concentrations exceeding the NYSDEC SGVs or June 2021 NYSDEC PFAS Guidance Values are listed below:

1. 1,2-dichloroethane was detected at 1 µg/L in monitoring well MW16, above the NYSDEC SGV of 0.6 µg/L . No other VOCs exceeded the NYSDEC SGVs.
2. Total manganese exceeded the NYSDEC SGV of 300 µg/L in 6 of 7 groundwater samples, including a maximum concentration of 924 µg/L in monitoring well MW18 (duplicate). Dissolved manganese also exceeded the NYSDEC SGV of 300 µg/L in 5 of 7 groundwater samples, including a maximum concentration of 934 µg/L in monitoring well MW18 (duplicate).
3. PFAS compounds, including perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluoropentanoic acid (PFPeA), and perfluorohexanoic acid (PFHxA), exceeded PFAS Guidance Values in 7 of 7 groundwater samples. PFOA was detected above the recommended guidance of 10 ng/L in monitoring wells MW13, MW13N, MW16, MW18, MW19, and MW22, with a maximum concentration of 170 ng/L in monitoring well MW18. PFOS was detected above the recommended guidance of 10 ng/L in monitoring well MW18 at a concentration of 25 ng/L. PFPeA was detected above the recommended guidance of 100 ng/L in monitoring wells MW18 and MW19 with a maximum concentration of 190 ng/L in monitoring well MW19. PFHxA was detected above the recommended guidance of 100 ng/L in monitoring well MW19 at a concentration of 120 ng/L. Total PFAS was detected above the recommended guidance of 500 ng/L in MW19 only, at 505 ng/L.

Exposure to remaining groundwater contamination is and will be prevented by a groundwater use restriction (Section 3.2).

2.5.3 Soil Vapor

Soil vapor sampling results from previous environmental investigations (before remediation) indicate the presence of several VOCs, including chlorinated VOCs and petroleum-related VOCs, in soil vapor. No concentrations exceeded the NYSDOH AGVs or minimum soil vapor concentrations recommending mitigation as set forth in the NYSDOH October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 GENERAL

Since remaining contamination exists at the site, ICs and ECs are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision with approval by the NYSDEC project manager. This plan provides:

1. A description of all IC/ECs on the site;
2. The basic implementation and intended role of each IC/EC;
3. A description of the key components of the ICs set forth in the Environmental Easement;
4. A description of the controls to be evaluated during each required inspection and periodic review;
5. A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the EWP (as provided in Appendix C) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
6. Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC project manager.

3.2 INSTITUTIONAL CONTROLS

A series of ICs are required by the Decision Document to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the site to restricted-residential, commercial, and industrial uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundary is shown on Figure 5. These ICs are:

1. The property may be used for restricted-residential use as described in 6 NYCRR Part 375-1.8(g)(2)(ii), commercial use as described in 6 NYCRR Part 375-1.8(g)(2)(iii), and industrial use as described in 6 NYCRR Part 375-1.8(g)(2)(iv);
2. All ECs must be operated and maintained as specified in this SMP;
3. All ECs must be inspected at a frequency and in a manner defined in the SMP;

4. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the NYSDEC;
5. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
6. Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
7. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP and the EWP;
8. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
9. Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
10. Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
11. The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundary noted on Figure 4, and any potential impacts that are identified must be monitored or mitigated; and
12. Vegetable gardens and farming in remaining soil on the site are prohibited.
13. An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

3.3 ENGINEERING CONTROLS

3.3.1 Site Cover System

Exposure to remaining contamination at the site is prevented by a site cover system as follows:

1. Building footprint – minimum 12-inch-thick concrete slab
2. Northern courtyard – minimum 2-inch-thick concrete slab or minimum of 2 feet of imported virgin quarry stone
3. Eastern courtyard – minimum of 2 feet of imported virgin quarry stone

4. Southern courtyard – minimum 2-inch-thick concrete slab or minimum of 2 feet of imported virgin quarry stone

A physical demarcation layer consisting of orange snow fencing was placed above remaining contamination before the placement of virgin quarry stone in areas outside of the building footprint to serve as a visual indicator if the backfill cover is penetrated in the future. The locations of the site cover system and details are shown on Figures 6A and 6B, respectively.

The Excavation Work Plan (EWP) provided in Appendix C outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed. Procedures for the inspection of the cover system are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendix E. Any disturbance of the site cover system must be overseen by a qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

The site cover system will be maintained to allow for restricted-residential use of the site. Any future site redevelopment must maintain or repair the existing cover system. Cover soil brought to the site will meet the SCOs as set forth in 6 NYCRR Part 375-6.7(d) (i.e., the lower of PGW SCOs or RURR SCOs). Should the building foundations or building slabs be removed in the future, a cover system consistent with the requirements outlined in the Decision Document will be placed in any areas where the upper two feet of newly exposed surface soil exceed the RURR SCOs.

3.3.2 Sub-Membrane Depressurization System

An active SMD system with a waterproofing/vapor barrier was installed beneath the building's concrete slab to mitigate potential soil vapor intrusion into the occupied building. The SMD system was designed in accordance with New York City Mechanical Code MC 512 Sub-Slab Exhaust Systems, New York City Local Law 2009/071, USEPA document EPA/625/R-92/016 for the Sub-Slab Depressurization of Large Buildings and Schools (1994), and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006), with updates (SVI Guidance). SMD systems create depressurized (low vacuum) fields beneath the floor slabs by extracting sub-slab air with a blower mounted on the roof of the building. The low vacuum fields create a negative pressure gradient and divert potentially-impacted vapors beneath the building to the atmosphere above the rooftop of the building, thereby mitigating the potential for vapor intrusion.

The SMD system includes a network of horizontal perforated piping set in the middle of a gas permeable gravel layer beneath a waterproofing/vapor barrier membrane and the building slab. The horizontal piping consists of 4-inch-diameter, slotted, polyvinyl chloride (PVC) vapor collection piping wrapped with a polyester filter sleeve. The gas permeable layer consists of a minimum 8-inch-thick layer of 3/4-inch gravel installed beneath the slab. The waterproofing/vapor barrier system consists of GCP Applied Technologies (GCP) PREPRUFE 300R Plus (46-mil) and GCP PREPRUFE 160R Plus (26-mil) membranes beneath three mat slab areas and Stego Wrap Vapor Barrier (20-mil) membrane beneath the remainder of the building slab.

Above-grade components of the SMD system (including the riser pipes, blowers, vacuum pressure monitoring points, and related accessories/monitoring devices) are being installed during building construction. The blowers will be located on the roof. The system will be equipped, at a minimum, with a visual alarm placed in a building maintenance office on the first floor to notify of a system failure. After the building is completed and before building occupancy, initial system start-up testing (SMP Section 5.3.1) will be performed to verify that all components are installed, and that the system is operating within design parameters. PE-certified as-built drawings of the completed SMD system will be submitted as an SMP modification to NYSDEC within 3 months of system start-up.

Operation of the active SMD system will not be discontinued without written approval by the NYSDEC and NYSDOH project managers. A proposal to discontinue the SMD system may be submitted by the Volunteer (or its successors) based on confirmatory data that justifies such request. The SMD system will remain in-place and operational until permission to discontinue its use is granted in writing by the NYSDEC project manager in consultation with the NYSDOH project manager.

Procedures for operating and maintaining the SMD system are documented in the Operation and Maintenance Plan (SMP Section 5.0). As-built drawings and supporting documents are included in Appendix H.

3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered complete when monitoring indicates that the remedy has achieved the RAOs identified by the Decision Document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.3.3.1 Site Cover System

The site cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

3.3.3.2 SMD System

The active SMD system will not be discontinued unless prior written approval is granted by the NYSDEC and NYSDOH project managers. In the event that monitoring or new sampling data indicates that the active SMD system may no longer be required, a proposal to discontinue the SMD system will be submitted by the remedial party to the NYSDEC and NYSDOH project managers. If approved to turn off the active blowers, the system will be modified for passive operation.

4.0 MONITORING AND SAMPLING PLAN

4.1 GENERAL

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy and may be revised with the approval of the NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management are included in the Quality Assurance Project Plan (QAPP) provided in Appendix F.

This Monitoring and Sampling Plan describes the methods to be used for:

1. Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
2. Monitoring for soil vapor intrusion for any new building constructed at the site;
3. Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
4. Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

To adequately address these methods, this Monitoring and Sampling Plan provides information on:

1. Sampling locations, protocol, and frequency;
2. Designed monitoring systems;
3. Analytical sampling program requirements; and
4. Annual inspection and periodic certification.

Reporting requirements are described in SMP Section 7.0.

4.2 SITE-WIDE INSPECTION

Site-wide inspections will be performed at a minimum of once per year. These periodic inspections must be conducted when the ground surface is visible (i.e., no snow cover). Site-wide inspections will be performed by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a QEP or PE. Modification to the frequency or duration of the inspections will require approval from the NYSDEC project manager. Site-wide inspections will also be performed after severe weather conditions that may affect ECs. During these inspections, an inspection form (Appendix G – Site Management Forms) will be completed. The form will compile sufficient information to assess the following:

1. Compliance with all ICs, including site usage;

2. Condition and effectiveness of ECs;
3. General site conditions at the time of the inspection;
4. Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
5. Documentation (HASP, CAMP, SMP, etc.) is available on-site; and
6. Site records are up-to-date.

A comprehensive site-wide inspection of all remedial components installed at the site will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report (PRR). The inspections will determine and document whether:

1. The ECs continue to perform as designed;
2. The ECs continue to protect human health and the environment;
3. The ECs comply with requirements of this SMP and the Environmental Easement;
4. Remedial performance criteria has been achieved; and
5. Site records are complete and up-to-date.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within five days of the event to verify the effectiveness of the ICs/ECs by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a QEP or PE. Written confirmation must be provided to the NYSDEC within seven days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. Responsibilities of the owner and other remedial parties are described in Appendix D.

4.3 ENGINEERING CONTROL MONITORING AND INSPECTIONS

4.3.1 Site Cover System

The site cover system provides a physical barrier to prevent exposure of contaminated soil/fill to sensitive receptors. Monitoring of the site cover system by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a QEP or PE will be performed at a minimum of once per year and following any severe weather or other such conditions that could affect the site cover system. Unscheduled inspections may take place when a suspected failure of the cover system has been reported or an emergency occurs that is deemed likely to affect the cover system. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

During these inspections, an inspection form will be completed as provided in Appendix G - Site Management Forms. The inspection requires sufficient information to certify the integrity of all elements of the cover system and should document any site cover disturbances. Any damage to the site cover identified during the inspection will be repaired in kind and in compliance with this SMP.

The waterproofing/vapor barrier cannot be visually inspected without compromising the concrete building slab. The membrane will be repaired following any intrusive work that extends below the membrane in accordance with the manufacturer specifications.

4.3.2 SMD System

Monitoring of the SMD system will be performed annually to evaluate whether the system is operating within design parameters. A visual inspection of the system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SMD system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SMD system components to be monitored include, but are not limited to, the components detailed in Table 4.3.2 below.

Table 4.3.2: Remedial System Monitoring Requirements and Schedule

SMD System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Vacuum Monitoring Points	Vacuum Pressure	-0.01 inches of water column (minimum)	Annual
Vacuum Gauges	Vacuum Pressure	-30 inches of water column (maximum)	Annual
Exhaust Points	Motor Operation and Air Flow Direction	N/A	Annual
Remote Alarm System	Functionality & Integrity	N/A	Annual
Exposed Riser Piping	Functionality, Integrity, and Labeling	N/A	Annual
Vacuum Blowers	Functionality & Integrity	N/A	Annual

Sampling of the SMD system effluent is not required based on concentrations of VOCs identified in soil vapor samples collected as part of the RI performed by Langan. A complete list of components to be inspected is provided in the inspection checklist, provided in Appendix G – Site Management Forms. If system parameters are not within their specified operation range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, immediate maintenance and repair is required in accordance with the Operation and Maintenance Plan.

4.4 POST-REMEDIATION MEDIA MONITORING AND SAMPLING

4.4.1 SMD System Vacuum Field Monitoring

A network of vacuum monitoring points (VMP) was installed to monitor on-site soil vapor conditions. Table 4.4.2 – Vacuum Monitoring Point Construction Details, summarizes the vacuum monitoring point identification number, location, and depth for each monitoring point.

Table 4.4.2 – Vacuum Monitoring Point Construction Details

VMP ID	Latitude			Longitude		
	Deg	Min	Sec	Deg	Min	Sec
VP-1	40	44	11.8104	73	57	29.6424
VP-2	40	44	13.128	73	57	30.8772
VP-3	40	44	13.0416	73	57	29.8044
VP-4	40	44	13.7148	73	57	29.7288
VP-5	40	44	12.498	73	57	28.3464

Vacuum monitoring point locations and vacuum monitoring point construction details are provided in Appendix H.

The NYSDEC will be notified prior to repair or decommissioning of any vacuum monitoring points for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR. Vacuum monitoring point decommissioning without replacement will be done only with the prior approval of the NYSDEC. Vacuum monitoring points that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The inspection frequency, as discussed in Section 4.3.2, may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC. Deliverables for the SMD system monitoring are specified in Section 7.0 (Reporting Requirements).

4.4.3 Monitoring and Sampling Protocol

All sampling protocols and activities will be recorded in accordance with the QAPP and recorded on the Site Management Forms provided in Appendix G. Other observations will be noted on the appropriate sampling log.

5.0 OPERATION AND MAINTENANCE PLAN FOR SMD SYSTEM

5.1 GENERAL

This Operation and Maintenance (O&M) Plan provides a brief description of the measures necessary to operate, monitor, and maintain the mechanical components of the SMD system. This O&M Plan:

1. Includes procedures for SMD system start-up and testing;
2. Includes the procedures necessary to allow individuals unfamiliar with the site to operate and maintain the SMD system.
3. Will be updated periodically to reflect changes in site conditions or the manner in which the SMD system is operated and maintained.

Routine inspection and maintenance of the SMD system is the responsible of the property owner and/or building management.

5.2 REMEDIAL SYSTEM PERFORMANCE CRITERIA

The SMD system, once fully constructed, will consist of two blowers connected to a sub-slab pipe network. The blowers will be Airtech model 3BA1430-7AT16 or approved alternates. The blowers will be operated in accordance with manufacturer's specifications and recommendations. The minimum required flow rate of each blower is as follows:

1. Blower A: 85 standard cubic feet per minute (scfm) at 26 inches of water vacuum.
2. Blower B: 86 scfm at 24 inches of water vacuum.

5.3 OPERATION AND MAINTENANCE OF THE SMD SYSTEM

The following sections provide a description of the O&M of the SMD system, which is based on the NYSDOH Guidance and USEPA Guidance Document EPA/625/R-92/016 for the Sub-Slab Depressurization of Large Buildings and Schools (1994). Manufacturer cut-sheets and as-built drawings for the SMD system are provided in Appendix H.

<u>5.3.1 System Start-Up and Testing</u>

Prior to initial SMD system start-up, all accessible SMD components will be inspected. The equipment will be started in accordance with the manufacturer's recommendations. System testing for the initial start-up will be performed as follows:

1. While the system is operating, smoke tubes will be used to check for leaks through concrete cracks, floor joints, and at exposed above-grade piping connections associated with the lowest-level slab. Any leaks identified will be properly sealed.

2. The blower-malfunction warning device will be tested.
3. Vacuum gauges and active blower exhaust ports on the blower assemblies will be checked to ensure that they are operating within design requirements.
4. Airflow rates will be measured through the sample ports with a TSI VelociCalc meter to document that airflow within the system is consistent with design calculations.
5. Vacuum pressure will be measured at the vacuum monitoring points with a TSI VelociCalc meter to verify pressure field extension and at the blower to document that vacuum conveyance is consistent with the design calculations.
6. The building's heating, ventilation, and air conditioning (HVAC) system will be operating under normal conditions.

The system testing described above will be conducted during the initial system start-up and if, in the course of the SMD system lifetime, significant changes are made to the system and the system is restarted.

5.3.2 Routine SMD System Operation and Maintenance

The SMD system and its vacuum blowers will operate continuously after the initial start-up in accordance with appropriate design specifications and parameters, the manufacturer's operation manual, and SMP requirements.

Routine equipment maintenance is the responsibility of building management. The blower assembly and its appurtenances shall be inspected at the interval specified in the manufacturer's operation manual. Routine equipment maintenance may include, but is not limited to, replacing the blower motor or other parts, replacing vacuum pressure gauges, replacing/cleaning air filters, and testing the remote alarm system.

If any technical difficulties or non-optimal operating conditions are encountered with the SMD system, the property owner and/or building management shall complete any necessary modifications or repairs to the system to bring the system into compliance with appropriate design specifications and parameters. The remedial party, NYSDEC and NYSDOH shall be notified of any significant modifications or repairs that are planned.

5.3.3 Non-Routine SMD System Operation and Maintenance

Non-routine maintenance may also be required during SMD system operation, including the following situations:

1. If the building's owner or maintenance staff report that the alarm device indicates the SMD system is not operating properly;
2. The SMD system becomes damaged; or

3. The building has undergone renovations that may reduce the effectiveness of the SMD system.

The NYSDEC will be informed within 24 hours upon discovery of SMD system failure. Repairs or adjustments will be made to the system as appropriate and as per manufacturer guidelines, within 15 days of the equipment failure, or whenever possible (i.e., pending availability of parts). If necessary, the system will be redesigned and restarted. Activities conducted during non-routine maintenance visits will vary.

5.3.4 System Performance Monitoring

Performance monitoring will be conducted by the Remedial Engineer (RE) or an individual under the supervision of the RE to document the effectiveness of the SMD system at the following milestones/intervals:

4. At the commissioning event and start-up inspection
5. Annually, concurrent with the annual site inspections
6. After any severe weather or other emergency conditions (natural disasters and/or fires) that has or may have damaged the system (if necessary)
7. After any significant repairs and/or modifications

Performance monitoring will include the similar procedures listed for the commissioning and startup inspection as stated in Section 5.3.1.

5.3.5 SMD System Monitoring Devices and Alarms

The SMD system has a warning device to indicate that the system is not operating properly. The alarm will be labeled as part of the vapor mitigation system and will direct staff to notify the appropriate parties listed in this SMP. In the event that the warning device is activated, applicable maintenance and repairs will be conducted and the SMD system will be restarted. Operational problems will be reported to NYSDEC within 24 hours as noted in 5.3.3 and will also be included, along with corrective actions, in the Periodic Review Report to be prepared for that reporting period.

6.0 PERIODIC ASSESSMENTS AND EVALUATIONS

6.1 CLIMATE CHANGE VULNERABILITY ASSESSMENT

Increases in the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns, and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial system(s). Vulnerability assessments provide information so that the site and associated remedial systems are prepared for impacts associated with the increasing frequency and intensity of severe storms/weather events and associated flooding. This section briefly summarizes the vulnerability of the site and ECs to severe storms/weather events and associated flooding.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Panel 3604970202G (revised December 5, 2013), most of the Subject Property is located in Zone X, which is defined as 0.2% annual chance flood areas. A portion of the site is located in Zone AE, which is subject to inundation by the 1% annual chance flood. The potential for floods at the site is moderate to low.

The SMD system receives electrical service from Consolidated Edison, Inc. (ConEd). A power loss and/or dips/surges in voltage during a severe weather event, including lightning strikes, may impact the SMD equipment and operations. The SMD system control panel will shut down the system in the event of a dip or surge in voltage. Continued mitigation for soil vapor intrusion is anticipated to be maintained by the waterproofing/vapor barrier membrane until power is restored.

Site erosion is not expected during severe weather or precipitation events because soil will be covered with vegetation or hardscaping (concrete, brick pavers, or stabilized decomposed granite). The building footprint protects the SMD system from extreme wind conditions and stormwater watershed. The development includes a series of stormwater inlets and underground pipes that collect excess stormwater runoff to be treated by water quality units before discharge to Newtown Creek through NYSDEC-permitted outfalls. ECs will be inspected after severe weather or other emergency conditions (natural disasters or fires) that are known to have inflicted damage at the site or adjoining properties and repaired, as necessary.

Overall, the site ECs are not expected to be vulnerable to the effects of global climate change, including severe weather and flooding events.

6.2 GREEN REMEDIATION EVALUATION

NYSDEC's Program Policy DER-31: Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program, including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the PRR.

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the NYSDEC project manager deems appropriate (e.g., during significant maintenance events or in conjunction with storm recovery events).

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance events. Reporting of these modifications will be presented in the PRR.

6.2.2 Remedial Systems

Remedial systems will be operated as necessary, considering the current site conditions, to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates and use of reagents and consumables. Spent materials will be sent for recycling, as appropriate.

The SMD system will not be discontinued without the approval of NYSDEC and NYSDOH. In the event that NYSDEC and NYSDOH allow the blowers to be turned off, the SMD system will be operated as a passive system through the use of wind turbines.

6.2.3 Building Operations

The building is expected to be operated and managed to maximize energy efficiency (as allowed by design), while minimizing waste generation and water consumption.

6.2.4 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the site and use of consumables in relation to visiting the site to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources. The responsibility of the routine and non-routine SMD system operation and maintenance was assigned to building management so as to reduce transportation to and from the site by other parties. Use of mass transit will be utilized for site visits, when practical.

6.3 REMEDIAL SYSTEM OPTIMIZATION

An RSO study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

1. Management and operation of the remedial system is exceeding the estimated costs;
2. Remedial system is not performing as expected or as designed;
3. Previously unidentified source material may be suspected;
4. Site conditions have changed due to development, change of use, change in groundwater use, etc.;
5. There is an anticipated transfer of the site management to another remedial party or agency;
6. A new and applicable remedial technology becomes available; and
7. Remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focus on the overall site cleanup strategy, process optimization, and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness, and remedial time frames. Green remediation technology and principles will be considered when performing the RSO study.

7.0 REPORTING REQUIREMENTS

7.1 SITE MANAGEMENT REPORTS

All site management inspection, maintenance, and monitoring events will be recorded on the appropriate Site Management Forms provided in Appendix G. These forms are subject to NYSDEC revision. Site management inspection, maintenance, and monitoring events will be conducted by a QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a QEP or PE who is licensed and registered in NYS.

Applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 7.1 and summarized in the subsequent PRR.

Table 7.1: Schedule of Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
SMD System	Annually
SMD System Vacuum Monitoring Points	Annually
Site Cover System	Annually and as needed
PRR	Annually

*The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

1. Date of event or reporting period;
2. Name, company, and position of person(s) conducting monitoring/inspection activities;
3. Description of the activities performed;
4. Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
5. Type of samples collected (e.g., sub-slab vacuum/indoor air);
6. Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);
7. Sampling results compared to appropriate standards/criteria;

8. A figure illustrating sample type and sampling locations;
9. Copies of all laboratory data sheets and the required laboratory data deliverables for all points sampled (to be submitted electronically in the NYSDEC-identified format);
10. Any observations, conclusions, or recommendations; and
11. A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

1. Date of event;
2. Name, company, and position of person(s) conducting the maintenance event;
3. Description of maintenance event performed;
4. Any modifications to the system;
5. Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
6. Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine (unscheduled) maintenance event reporting forms will include, at a minimum:

1. Date of event;
2. Name, company, and position of person(s) conducting non-routine maintenance event;
3. Description of non-routine maintenance event performed;
4. Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
5. Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 PERIODIC REVIEW REPORT

The initial PRR will be submitted to the NYSDEC project manager beginning 16 months after the Certificate of Completion is issued. Subsequent PRRs shall be submitted annually to the NYSDEC or at another frequency as may be required by the NYSDEC project manager. In the event that the site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the site described in Appendix A (Environmental Easement). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 30 days of the end of each certification period. The PRR will include:

1. Identification, assessment and certification of all ICs/ECs required by the remedy for the site.
2. Results of the required annual site inspections and severe condition inspections, if applicable.
3. All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted
4. A summary of any monitoring data and/or information generated during the reporting period, with comments and conclusions.
5. Countersigned manifests and weight tickets (as applicable) for solid wastes (e.g., soil or liquids) transported and disposed of off-site during the reporting period - Such waste may include excavated soil/fill or purged groundwater collected during a groundwater sampling event.
6. Data summary tables and graphical representations of contaminants of concern by media (i.e., groundwater), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. The summary tables will include a presentation of past data as part of an evaluation of contaminant concentration trends. Trend monitoring graphs will be included that show contaminant levels from the start of the remedy to the most recent sampling data.
7. Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
8. A site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the site-specific Decision Document;
    - The operation and effectiveness of ECs including identification of any needed repairs or modifications;

- Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan (Section 4.0) for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan (Section 4.0);
- An evaluation of trends in contaminant levels in the affected media to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document; and
- The overall performance and effectiveness of the remedy.

9. A performance summary for all ECs during the calendar year, including information such as:
    - The number of days the system operated for the reporting period;
    - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
    - A description of the resolution of performance problems;
    - Alarm conditions;
    - Trends in equipment failure; and
    - Comments, conclusions, and recommendations based on data evaluation.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the PRR, the following certification as per the requirements of NYSDEC DER-10:

"For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and,*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Jason J. Hayes, P.E., of Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., am certifying as the Remedial Party's Designated Site Representative: I have been authorized and designated by all site owners/remedial parties to sign this certification for the site."

"I certify that the New York State Education Department has granted a Certificate of Authorization to provide Professional Engineering services to the firm that prepared this Periodic Review Report."

Every five years, the following certification will be added to the above list:

- *Based on the on-site data available to Langan and site observations, the assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the PRR.

The PRR will be submitted, in electronic format, to the NYSDEC project manager and NYSDOH project manager. The PRR may need to be submitted in hard-copy format, if requested by the NYSDEC project manager.

7.3 CORRECTIVE MEASURES WORK PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided because of the failure of an IC or EC, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

7.4 REMEDIAL SITE OPTIMIZATION REPORT

In the event that an RSO is to be performed (see Section 6.3), upon completion of said RSO, an RSO report must be submitted to the Department for approval. A general outline for the RSO report is provided in Appendix I. The RSO report will document the research/investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model, and present recommendations. RSO recommendations are to be implemented upon approval by the NYSDEC. Based upon the actions that need to be taken, additional documents (e.g., work plans, design documents, HASPs, etc.) may still be required to implement the RSO recommendations. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager

8.0 REFERENCES

The following references were reviewed as part of this SMP:

1. 6 NYCRR Part 375 – Environmental Remediation Programs (December 14, 2006).
2. 6 NYCRR Part 703.5 – Water Quality Standards (January 31, 2017).
3. EPA – 625/R/92/016 Radon Prevention in the Design and Construction of Schools and Other Large Buildings Third Printing with Addendum (June 1994).
4. NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation (May 2010).
5. NYSDEC DER-31 – Green Remediation (August 2010).
6. NYSDEC – Technical and Operational Guidance Series (TOGS) Ambient Water Quality Standards and Guidance Values for Class GA Water (June 1998, April 2000 addendum).
7. NYSDOH – Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006).
8. Phase I Environmental Site Assessment – Greenpoint Lumber Yard, Brooklyn, New York, prepared by AKRF, Inc. dated July 2001.
9. Remedial Investigation Report – Parcels D1, D2, E3, F, G, and H, prepared by Langan, dated Mary 19, 2014.
10. Remedial Investigation Report – 45 Commercial Street, performed by Langan, dated October 29, 2020.
11. Subsurface Investigation – 45 Commercial Street, performed by Langan, dated September 2019.
12. Supplemental Subsurface (Phase II) Investigation Report – Greenpoint Lumber Yard, Brooklyn, New York, prepared by AKRF, Inc., dated April 2004.

TABLES

Table 1
Soil Cleanup Objectives

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

VOCs (mg/kg)	
1,1,1-Trichloroethane	100
1,1-Dichloroethane	26
1,1-Dichloroethene	100
1,2-Dichlorobenzene	100
1,2-Dichloroethane	3.1
cis-1,2-Dichloroethene	100
trans-1,2-Dichloroethene	100
1,3-Dichlorobenzene	49
1,4-Dichlorobenzene	13
1,4-Dioxane	13
Acetone	100
Benzene	4.8
Butylbenzene	100
Carbon tetrachloride	2.4
Chlorobenzene	100
Chloroform	49
Ethylbenzene	41
Hexachlorobenzene	1.2
Methyl ethyl ketone	100
Methyl tert-butyl ether	100
Methylene chloride	100
n-Propylbenzene	100
sec-Butylbenzene	100
tert-Butylbenzene	100
Tetrachloroethene	19
Toluene	100
Trichloroethene	21
1,2,4-Trimethylbenzene	52
1,3,5- Trimethylbenzene	52
Vinyl chloride	0.9
Xylene (mixed)	100
Inorganics (mg/kg)	
Arsenic	16
Barium	400
Beryllium	72
Cadmium	4.3
Chromium, hexavalent	110
Chromium, trivalent	180
Copper	270
Total Cyanide	27
Lead	400
Manganese	2,000
Total Mercury	0.81
Nickel	310
Selenium	180
Silver	180
Zinc	10000

SVOCs (mg/kg)	
Acenaphthene	100
Acenaphthylene	100
Anthracene	100
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(g,h,i)perylene	100
Benzo(k)fluoranthene	3.9
Chrysene	3.9
Dibenzo(a,h)anthracene	0.33
Dibenzofuran	59
Fluoranthene	100
Fluorene	100
Indeno(1,2,3-cd)pyrene	0.5
m-Cresol	100
Naphthalene	100
o-Cresol	100
p-Cresol	100
Pentachlorophenol	6.7
Phenanthrene	100
Phenol	100
Pyrene	100
Total SVOCs	500
PCBs/Pesticides (mg/kg)	
2,4,5-TP Acid (Silvex)	100
4,4'-DDE	8.9
4,4'-DDT	7.9
4,4'-DDD	13
Aldrin	0.097
alpha-BHC	0.48
beta-BHC	0.36
Chlordane (alpha)	4.2
delta-BHC	100
Dibenzofuran	59
Dieldrin	0.2
Endosulfan I	24
Endosulfan II	24
Endosulfan sulfate	24
Endrin	11
Heptachlor	2.1
Lindane	1.3
Polychlorinated biphenyls	1
TCLP Inorganics (mg/L)	
Lead	5
PFAS (µg/kg)	
PFOA	1.1

Notes:

1. The Site-Specific SCOs for a Track 4 Cleanup are generally New York State Department of Environmental Conservation Title 6 of the official compilation of New York Codes, Rules, and Regulations Part 375 Restricted Use Restricted -Residential Soil Cleanup Objectives (SCO) for VOCs, SVOCs, PCBs, pesticides, herbicides, and metals (with the exception of total SVOCs, TCLP lead and the guidance value for PFOA).
2. VOC = volatile organic compound
3. SVOC = semivolatile organic compound
4. PCB = polychlorinated biphenyl
5. TCLP = toxicity characteristic leaching procedure
6. mg/kg = milligram per kilogram
7. mg/L = milligrams per liter
8. PFAS = per- and polyfluoroalkyl substances
9. PFOA = perfluorooctanoic acid

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP01	EP02	EP03	EP04
				Sample Name	EP01_2	EP02_2	EP03_2	EP04_2
				Sample Date	08/03/2021	08/03/2021	08/19/2021	08/11/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0019 U	0.00024 J	<0.0024 U	<0.0022 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0019 UJ	<0.0023 UJ	<0.0024 U	<0.0022 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0028 U	<0.0034 U	<0.0036 U	<0.0032 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	0.00097	<0.0011 U	<0.0012 U	<0.0011 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.076 UJ	<0.092 UJ	<0.097 U	<0.086 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.0095 U	<0.011 U	<0.012 U	<0.011 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.0095 U	<0.011 U	<0.012 U	<0.011 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0038 UJ	<0.0046 UJ	<0.0049 U	<0.0043 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0038 U	<0.0046 U	<0.0049 U	<0.0043 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.0095 UJ	<0.011 UJ	<0.012 U	<0.011 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0014 U	<0.0017 U	<0.0018 U	<0.0016 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0038 UJ	<0.0046 UJ	<0.0049 U	<0.0043 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
Cymene	99-87-6	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.0095 UJ	<0.011 UJ	<0.012 U	<0.011 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0038 U	<0.0046 U	<0.0049 U	<0.0043 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.0095 UJ	<0.011 UJ	<0.012 UJ	<0.011 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.0095 UJ	<0.011 UJ	<0.012 U	<0.011 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0047 U	<0.0057 U	<0.0061 U	<0.0054 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0038 U	<0.0046 U	<0.0049 U	<0.0043 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Styrene	100-42-5	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0019 U	<0.0023 U	<0.0024 U	<0.0022 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
Toluene	108-88-3	0.7	100	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0014 U	<0.0017 U	<0.0018 U	<0.0016 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0047 U	<0.0057 U	<0.0061 U	<0.0054 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00047 U	<0.00057 U	<0.00061 U	<0.00054 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0038 U	<0.0046 U	<0.0049 U	<0.0043 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.0095 U	<0.011 U	<0.012 U	<0.011 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.00095 U	<0.0011 U	<0.0012 U	<0.0011 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP01	EP02	EP03	EP04
				Sample Name	EP01_2	EP02_2	EP03_2	EP04_2
				Sample Date	08/03/2021	08/03/2021	08/19/2021	08/11/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	0.048 J	0.068 J	<0.17 U	0.035 J
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.026 U	<0.028 U	<0.026 UJ	<0.027 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.1 U	<0.11 U	<0.1 U	<0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.15 U	<0.16 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.84 UJ	<0.9 UJ	<0.82 U	<0.87 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.36	0.52	<0.21 U	0.64
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 UJ	<0.19 UJ	<0.17 U	<0.18 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.38 UJ	<0.4 UJ	<0.37 U	<0.39 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<0.25 U	0.076 J	<0.25 U	<0.26 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.46 UJ	<0.49 UJ	<0.45 U	<0.47 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.25 UJ	<0.26 UJ	<0.24 U	<0.25 U
Acenaphthene	83-32-9	20	100	mg/kg	0.4	0.49	<0.14 U	0.34
Acenaphthylene	208-96-8	100	100	mg/kg	0.16	0.17	<0.14 U	0.14
Acetophenone	98-86-2	NS	NS	mg/kg	0.041 J	<0.19 U	<0.17 U	<0.18 U
Anthracene	120-12-7	100	100	mg/kg	1	1.1	<0.1 U	0.81
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**2.7**	**2.7**	0.051 J	**1.9**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**2.2**	**2.3**	<0.14 U	**1.8**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**2.8**	**3**	0.046 J	**2.2**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	1.4	1.4	0.029 J	1.3
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**0.86**	0.76	<0.1 U	**0.94**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.57 UJ	<0.61 UJ	<0.56 U	<0.58 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 UJ	<0.19 UJ	<0.17 U	<0.18 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	0.093 J	0.1 J	<0.39 U	0.14 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.19 U	<0.2 U	<0.18 U	<0.2 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.15 U	<0.16 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.21 UJ	<0.22 UJ	<0.21 U	<0.22 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.81 J	0.83 J	<0.17 U	0.43
Carbazole	86-74-8	NS	NS	mg/kg	0.35	0.36	<0.17 U	0.26
Chrysene	218-01-9	**1**	3.9	mg/kg	**2.6**	**2.6**	0.043 J	**2**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.38**	**0.41**	<0.1 U	**0.37**
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.35	0.4	<0.17 U	0.4
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	0.11 J	<0.19 U	<0.17 U	<0.18 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 UJ	<0.19 UJ	<0.17 U	<0.18 U
Fluoranthene	206-44-0	**100**	100	mg/kg	5	5.2	0.093 J	3
Fluorene	86-73-7	30	100	mg/kg	0.38	0.56	<0.17 U	0.37
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.1 U	<0.11 U	<0.1 U	<0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.5 U	<0.54 U	<0.49 U	<0.52 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.14 U	<0.15 U	<0.14 U	<0.14 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**1.6**	**1.6**	0.031 J	**1.4**
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.15 U	<0.16 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.57	0.8	<0.17 U	0.69
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.15 U	<0.16 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.14 U	<0.15 U	<0.14 U	<0.14 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.14 U	<0.15 U	<0.14 U	<0.14 U
Phenanthrene	85-01-8	**100**	100	mg/kg	4	4.5	0.055 J	2.8
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	<0.19 U	<0.17 U	<0.18 U
Pyrene	129-00-0	100	100	mg/kg	4.7	4.7	0.085 J	3
Total SVOCs	SVOCs	NS	500	mg/kg	32.912	34.644	0.433	24.965

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45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP01	EP02	EP03	EP04
				Sample Name	EP01_2	EP02_2	EP03_2	EP04_2
				Sample Date	08/03/2021	08/03/2021	08/19/2021	08/11/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	**0.0178 J**	**0.0147 J**	0.000734 J	**0.00506**
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	**0.00367 J**	**0.00658 J**	<0.00166 U	**0.00508**
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.00769**	**0.00998 J**	<0.00312 U	**0.00383 J**
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00168 U	<0.00183 U	<0.00166 U	<0.0017 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000698 U	<0.000762 U	<0.000693 U	<0.00071 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	0.00176 J	0.00101 J	<0.00208 U	<0.00213 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00168 U	<0.00183 U	<0.00166 U	<0.0017 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00168 U	<0.00183 U	<0.00166 U	<0.0017 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00168 U	<0.00183 U	<0.00166 U	<0.0017 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	0.0224 J	0.0268 J	<0.0138 U	<0.0142 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00168 U	<0.00183 U	<0.00166 U	<0.0017 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00105 U	<0.00114 U	<0.00104 U	<0.00106 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000698 U	<0.000762 U	<0.000693 U	<0.00071 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000698 U	<0.000762 U	<0.000693 U	<0.00071 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.0021 U	<0.00229 U	<0.00208 U	<0.00213 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00168 U	<0.00183 U	<0.00166 U	<0.0017 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000698 U	<0.000762 U	<0.000693 U	<0.00071 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	0.00288 J	0.00245 J	<0.00208 U	<0.00213 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000838 U	<0.000915 U	<0.000832 U	<0.000852 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00314 U	<0.00343 U	<0.00312 U	<0.0032 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00314 UJ	<0.00343 UJ	<0.00312 U	<0.0032 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0314 UJ	<0.0343 UJ	<0.0312 U	<0.032 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.176 U	<0.187 U	<0.175 U	<0.182 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.176 U	<0.187 U	<0.175 U	<0.182 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.176 U	<0.187 U	<0.175 U	<0.182 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0357 U	<0.0375 U	<0.0341 U	<0.0346 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0357 U	<0.0375 U	<0.0341 U	<0.0346 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0357 U	<0.0375 U	<0.0341 U	<0.0346 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0357 U	<0.0375 U	<0.0341 U	<0.0346 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0357 U	<0.0375 U	<0.0341 U	<0.0346 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0357 U	0.0235 J	<0.0341 U	0.0322 J
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.0242 J	0.0309 J	<0.0341 U	0.0217 J
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0357 U	<0.0375 U	<0.0341 U	<0.0346 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0357 U	0.0094 J	<0.0341 U	<0.0346 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0242 J	0.0638 J	<0.0341 U	0.0539 J
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	3,220	3,360	902	7,660
Antimony	7440-36-0	NS	NS	mg/kg	0.604 J	0.921 J	0.316 J	1.06 J
Arsenic	7440-38-2	**13**	16	mg/kg	**15.7**	**14.4**	6.27	**30.9**
Barium	7440-39-3	**350**	400	mg/kg	134	118	11.4	112
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.229 J	0.474	0.126 J	0.588
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.874	0.976	0.095 J	0.52 J
Calcium	7440-70-2	NS	NS	mg/kg	73,400	88,000	152,000	21,200
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.868 U	<0.917 U	<0.842 U	<0.882 UJ
Chromium, Total	7440-47-3	NS	NS	mg/kg	15.7	16.1	2.72	36.9
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	16	16	2.7	**37**
Cobalt	7440-48-4	NS	NS	mg/kg	7.08	10.7	2.16	30.3
Copper	7440-50-8	**50**	270	mg/kg	**118**	**174**	21.7	**148**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	13,500	16,400	5,370	36,300
Lead	7439-92-1	**63**	400	mg/kg	**483**	**320**	14.2	**216**
Magnesium	7439-95-4	NS	NS	mg/kg	22,700	33,200	84,200	4,530
Manganese	7439-96-5	1600	2000	mg/kg	204	190	144	707
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.335**	**0.279**	0.05 J	**0.53**
Nickel	7440-02-0	**30**	310	mg/kg	15	22.8	3.66	16.7
Potassium	7440-09-7	NS	NS	mg/kg	516	612	201	1,340
Selenium	7782-49-2	**3.9**	180	mg/kg	1.31 J	1.43 J	0.379 J	3.29
Silver	7440-22-4	2	180	mg/kg	<0.817 U	<0.912 U	<0.79 U	<0.853 U
Sodium	7440-23-5	NS	NS	mg/kg	256	206	145 J	354
Thallium	7440-28-0	NS	NS	mg/kg	<1.63 U	<1.82 U	<1.58 U	<1.7 U
Vanadium	7440-62-2	NS	NS	mg/kg	21.1	24.7	6.97	27.9
Zinc	7440-66-6	**109**	10000	mg/kg	**380**	**462**	27.4	**391**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	92.2	87.2	95	90.7
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 UJ	<0.000506 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.00026 U	<0.000265 U	<0.000245 U	<0.000253 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.00026 U	<0.000265 U	<0.000245 U	<0.000253 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.00026 U	<0.000265 U	<0.000245 U	<0.000253 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.00026 U	<0.000265 U	<0.000245 U	<0.000253 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000097 J	<0.000265 U	<0.000245 U	<0.000253 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	0.0003	<0.000265 U	<0.000245 U	<0.000253 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	<0.00026 U	0.000061 J	0.000053 J	0.000158 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.00052 U	<0.000531 U	<0.000491 U	<0.000506 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.0003	0.000061 J	0.000053 J	0.000158 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP05	EP06	EP07	EP08
				Sample Name	EP05_2	EP06_2	EP07_2	EP08_2
				Sample Date	08/10/2021	08/24/2021	08/04/2021	08/04/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.001 UJ	<0.0014 U	<0.0013 U	<0.0012 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0031 U	<0.0043 U	<0.004 U	<0.0036 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.082 U	<0.12 U	<0.11 U	<0.096 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.002 UJ	<0.0029 U	<0.0026 U	<0.0024 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.01 UJ	<0.014 U	<0.013 U	<0.012 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.01 U	<0.014 U	<0.013 U	<0.012 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0041 UJ	<0.0058 U	<0.0053 U	<0.0048 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0041 U	<0.0058 U	<0.0053 U	<0.0048 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.01 UJ	<0.014 U	<0.013 U	<0.012 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0015 U	<0.0022 U	0.00019 J	<0.0018 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0041 UJ	<0.0058 U	<0.0053 U	<0.0048 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
Cymene	99-87-6	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.01 UJ	<0.014 U	<0.013 U	<0.012 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0041 U	<0.0058 U	<0.0053 U	<0.0048 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.01 UJ	<0.014 U	<0.013 UJ	<0.012 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.01 UJ	<0.014 U	<0.013 U	<0.012 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0051 U	<0.0072 U	<0.0066 U	<0.006 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0041 U	<0.0058 U	<0.0053 U	<0.0048 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Styrene	100-42-5	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.002 U	<0.0029 U	<0.0026 U	<0.0024 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
Toluene	108-88-3	0.7	100	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0015 U	<0.0022 U	<0.002 U	<0.0018 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.001 U	<0.0014 U	<0.0013 U	<0.0012 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0051 U	<0.0072 U	<0.0066 U	<0.006 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00051 U	<0.00072 U	<0.00066 U	<0.0006 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0041 U	<0.0058 U	<0.0053 U	<0.0048 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.01 U	<0.014 U	<0.013 U	<0.012 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.001 UJ	<0.0014 U	<0.0013 U	<0.0012 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP05	EP06	EP07	EP08
				Sample Name	EP05_2	EP06_2	EP07_2	EP08_2
				Sample Date	08/10/2021	08/24/2021	08/04/2021	08/04/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.027 U	<0.03 U	<0.026 U	<0.027 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.12 U	<0.11 U	<0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.16 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.87 U	<0.94 U	<0.85 U	<0.86 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.3	0.067 J	0.29	0.18 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.39 U	<0.42 U	<0.38 U	<0.39 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<0.26 U	<0.28 U	0.029 J	<0.26 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.47 UJ	<0.51 U	<0.46 U	<0.47 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.25 U	<0.28 U	<0.25 U	<0.25 U
Acenaphthene	83-32-9	20	100	mg/kg	0.22	0.11 J	0.35	0.18
Acenaphthylene	208-96-8	100	100	mg/kg	0.17	0.12 J	0.19	0.066 J
Acetophenone	98-86-2	NS	NS	mg/kg	<0.18 U	<0.2 U	0.029 J	<0.18 U
Anthracene	120-12-7	100	100	mg/kg	0.94	0.25	0.9	0.39
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**2.9**	0.98	**2**	0.86
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**2.6**	0.93	**2**	0.85
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**3.1**	**1.2**	**2.5**	**1.1**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	2	0.58	1.3	0.6
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**1.3**	0.33	0.73	0.28
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.59 U	<0.64 U	<0.57 U	<0.58 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	0.097 J	<0.45 U	0.1 J	<0.41 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.21 U	<0.19 U	<0.19 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.16 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.24 U	<0.21 U	<0.22 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.43	0.088 J	0.39	0.14 J
Carbazole	86-74-8	NS	NS	mg/kg	0.23	0.14 J	0.3	0.14 J
Chrysene	218-01-9	**1**	3.9	mg/kg	**2.7**	0.91	**2**	0.84
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.53**	0.14	0.32	0.14
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.34	0.077 J	0.31	0.14 J
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	0.045 J	0.67	<0.18 U	<0.18 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
Fluoranthene	206-44-0	**100**	100	mg/kg	4.4	1.9	4.1	1.8
Fluorene	86-73-7	30	100	mg/kg	0.25	0.12 J	0.44	0.18
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.12 U	<0.11 U	<0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.52 U	<0.56 U	<0.51 U	<0.52 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.14 U	<0.16 U	<0.14 U	<0.14 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**2.1**	**0.64**	**1.4**	**0.64**
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.16 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.5	0.1 J	0.38	0.24
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.16 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.14 U	<0.16 U	0.039 J	0.035 J
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.14 U	<0.16 U	<0.14 U	<0.14 U
Phenanthrene	85-01-8	**100**	100	mg/kg	3.2	1.3	3.4	1.5
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.18 U
Pyrene	129-00-0	100	100	mg/kg	4.1	1.6	3.7	1.7
Total SVOCs	SVOCs	NS	500	mg/kg	32.452	12.252	27.197	12.001

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45 Commercial Street, Brooklyn, New York
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				Sample Date	08/10/2021	08/24/2021	08/04/2021	08/04/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00176 U	0.00157 J	<0.0841 U	**0.00339 J**
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00176 U	**0.0238**	<0.0841 U	**0.00351 J**
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.00479**	**0.0158**	<0.158 U	**0.00472 J**
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00176 U	<0.00185 U	<0.0841 U	<0.00169 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000735 U	<0.000771 U	<0.035 U	<0.000704 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.0022 U	0.00195 J	<0.105 U	0.000678 J
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00176 U	<0.00185 U	<0.0841 U	<0.00169 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00176 U	<0.00185 U	<0.0841 U	<0.00169 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00176 U	<0.00185 U	<0.0841 U	<0.00169 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0147 U	<0.0154 U	<0.701 U	<0.0141 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00176 U	<0.00185 U	<0.0841 U	<0.00169 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.0011 U	<0.00116 U	<0.0525 U	<0.00106 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000735 U	<0.000771 U	<0.035 U	<0.000704 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000735 U	<0.000771 U	<0.035 U	<0.000704 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.0022 U	<0.00231 U	<0.105 U	<0.00211 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00176 U	<0.00185 U	<0.0841 U	<0.00169 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000735 U	<0.000771 U	<0.035 U	<0.000704 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.0022 U	0.00188 J	<0.105 U	0.00157 J
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000882 U	<0.000925 U	<0.042 U	<0.000845 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00331 U	<0.00347 U	<0.158 U	0.00138 J
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00331 U	<0.00347 U	<0.158 U	<0.00317 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0331 U	<0.0347 U	<1.58 U	<0.0317 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.183 U	<0.195 U	<0.178 U	<0.179 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.183 U	<0.195 U	<0.178 U	<0.179 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.183 U	<0.195 U	<0.178 U	<0.179 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.0378	0.00944 J	<0.0353 U	0.0161 J
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0362 U	<0.0385 U	<0.0353 U	<0.0352 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0378	0.00944 J	<0.0353 U	0.0161 J
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	12,500 J	4,670	4,100	2,700
Antimony	7440-36-0	NS	NS	mg/kg	2.67 J	<4.62 U	1.86 J	0.753 J
Arsenic	7440-38-2	**13**	16	mg/kg	**82.5 J**	9.3	**15**	12.1
Barium	7440-39-3	**350**	400	mg/kg	329 J	**1,360**	143	99.1
Beryllium	7440-41-7	**7.2**	72	mg/kg	1.11 J	1.08	0.606	0.372 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.665 J	0.694 J	0.421 J	0.207 J
Calcium	7440-70-2	NS	NS	mg/kg	36,100 J	35,200	67,600	148,000
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.893 U	<0.95 U	<0.859 UJ	<0.871 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	44.1 J	26.4	15.1	9.68
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	**44**	26	15	9.7
Cobalt	7440-48-4	NS	NS	mg/kg	14.9 J	8.29	7.48	4.97
Copper	7440-50-8	**50**	270	mg/kg	**267 J**	**96.4**	**109**	**59.7**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	70,900 J	13,400	15,300	10,200
Lead	7439-92-1	**63**	400	mg/kg	**712 J**	**3,750**	**297**	**129**
Magnesium	7439-95-4	NS	NS	mg/kg	14,900 J	4,980	30,500	72,300
Manganese	7439-96-5	1600	2000	mg/kg	373 J	174	187	159
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.65**	**0.244 J**	**0.233 J**	**0.214**
Nickel	7440-02-0	**30**	310	mg/kg	**33.8 J**	16.7	14.9	8.69
Potassium	7440-09-7	NS	NS	mg/kg	1,950 J	1,830	865	513
Selenium	7782-49-2	**3.9**	180	mg/kg	2.55	0.379 J	0.96 J	1.22 J
Silver	7440-22-4	2	180	mg/kg	0.332 J	<0.925 U	<0.842 U	<0.828 U
Sodium	7440-23-5	NS	NS	mg/kg	586 J	193	208	212
Thallium	7440-28-0	NS	NS	mg/kg	<1.7 UJ	<1.85 U	<1.68 U	<1.66 U
Vanadium	7440-62-2	NS	NS	mg/kg	60.7 J	26.8	19.8	14.7
Zinc	7440-66-6	**109**	10000	mg/kg	**757 J**	**1,220**	**406**	**215**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	89.6	84.2	93.1	91.8
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000263 U	<0.000268 U	<0.000249 U	<0.00025 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000526 U	0.000093 J	0.000025 J	<0.0005 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.000072 J	0.000442	<0.000249 U	<0.00025 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000263 U	0.000086 J	<0.000249 U	<0.00025 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000263 U	<0.000268 U	<0.000249 U	<0.00025 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000526 U	0.000126 J	<0.000498 U	<0.0005 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000086 J	0.000564	<0.000249 U	<0.00025 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	0.000502	**0.00189**	0.000151 J	0.00017 J
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000087 J	**0.000867**	0.000055 J	0.000051 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	0.000071 J	0.000116 J	<0.000498 U	<0.0005 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000526 U	0.000054 J	<0.000498 U	<0.0005 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000526 U	<0.000536 U	<0.000498 U	<0.0005 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000589 J	0.00276	0.000206 J	0.000221 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP09	EP10	EP10	EP11
				Sample Name	EP09_2	EP10_2	EPDUP01_083021	EP11_2
				Sample Date	08/19/2021	08/30/2021	08/30/2021	08/25/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0033 U	<0.0044 U	<0.0035 U	<0.0025 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.088 U	<0.12 U	<0.093 U	<0.067 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.011 U	<0.015 UJ	<0.012 UJ	<0.0084 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.011 U	<0.015 U	<0.012 U	<0.0084 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0044 U	<0.0059 U	<0.0047 U	<0.0034 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0044 U	<0.0059 U	<0.0047 U	<0.0034 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.012 U	<0.0084 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0016 U	<0.0022 U	<0.0017 U	<0.0012 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0044 U	<0.0059 U	<0.0047 U	<0.0034 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.012 U	<0.0084 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0044 U	<0.0059 U	<0.0047 U	<0.0034 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.011 UJ	<0.015 U	<0.012 U	<0.0084 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.012 U	<0.0084 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0055 U	<0.0074 U	<0.0058 U	<0.0042 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0044 U	<0.0059 U	<0.0047 U	<0.0034 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0022 U	<0.0029 U	<0.0023 U	<0.0017 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0011 U	<0.0015 U	0.00065 J	<0.00084 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0016 U	<0.0022 U	<0.0017 U	<0.0012 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0055 U	<0.0074 U	<0.0058 U	<0.0042 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00055 U	<0.00074 U	<0.00058 U	<0.00042 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0044 U	<0.0059 U	<0.0047 U	<0.0034 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.012 U	<0.0084 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0011 U	<0.0015 U	<0.0012 U	<0.00084 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	**Location**	EP09	EP10	EP10	EP11
				Sample Name	EP09_2	EP10_2	EPDUP01_083021	EP11_2
				Sample Date	08/19/2021	08/30/2021	08/30/2021	08/25/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	0.068 J	0.056 J	<0.96 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.028 UJ	<0.027 U	<0.027 U	<0.14 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.11 U	<0.11 U	<0.57 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.16 U	<0.86 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.88 U	<0.86 U	<0.86 U	<4.6 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.061 J	0.7	0.63	0.25 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.4 U	<0.39 U	<0.39 U	<2.1 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<0.26 U	0.036 J	<0.26 U	<1.4 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.48 U	<0.47 U	<0.47 U	<2.5 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.26 U	<0.25 U	<0.25 U	<1.3 U
Acenaphthene	83-32-9	20	100	mg/kg	0.037 J	0.16	0.15	0.34 J
Acenaphthylene	208-96-8	100	100	mg/kg	0.037 J	0.14	0.12 J	0.18 J
Acetophenone	98-86-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
Anthracene	120-12-7	100	100	mg/kg	0.12	0.38	0.36	1.1
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	0.5	0.86	0.84	**3.5**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	0.54	0.8	0.84	**3.3**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	0.62	**1.2**	**1.1**	**4.2**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	0.35	0.64	0.64	2.2
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	0.24	0.34	0.36	**1.4**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.6 U	<0.58 U	<0.58 U	<3.1 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<0.42 U	0.13 J	0.12 J	<2.2 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.19 U	<0.19 U	<1 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.16 U	<0.86 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.22 U	<0.22 U	<1.1 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	<0.18 U	0.98	0.78	0.47 J
Carbazole	86-74-8	NS	NS	mg/kg	0.039 J	0.095 J	0.085 J	0.26 J
Chrysene	218-01-9	**1**	3.9	mg/kg	0.51	0.96	0.97	**3.2**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	0.077 J	0.16	0.15	**0.49 J**
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.033 J	0.24	0.21	0.4 J
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.18 U	0.096 J	0.056 J	<0.96 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
Fluoranthene	206-44-0	**100**	100	mg/kg	0.78	1.7	1.6	6.8
Fluorene	86-73-7	30	100	mg/kg	0.04 J	0.24	0.18	0.34 J
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.11 U	<0.11 U	<0.57 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.53 U	<0.51 U	<0.51 U	<2.7 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.15 U	<0.14 U	<0.14 U	<0.77 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	0.37	**0.64**	**0.66**	**2.3**
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.16 U	<0.86 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.098 J	0.54	0.44	0.44 J
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.16 U	<0.86 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.18 U	<0.96 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.15 U	<0.14 U	<0.14 U	<0.77 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.15 U	<0.14 U	<0.14 U	<0.77 U
Phenanthrene	85-01-8	**100**	100	mg/kg	0.43	1.4	1.4	5.4
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	0.047 J	<0.18 U	<0.96 U
Pyrene	129-00-0	100	100	mg/kg	0.86	1.6	1.6	6
Total SVOCs	SVOCs	NS	500	mg/kg	5.742	14.152	13.347	42.57

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP09	EP10	EP10	EP11
				Sample Name	EP09_2	EP10_2	EPDUP01_083021	EP11_2
				Sample Date	08/19/2021	08/30/2021	08/30/2021	08/25/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	**0.00511**	**0.00831 J**	**0.00902 J**	0.00242
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00175 U	**0.00713 J**	**0.00611 J**	<0.0018 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.0113**	<0.00329 U	<0.0032 U	<0.00337 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00175 U	<0.00175 U	<0.00171 U	<0.0018 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000728 U	<0.000731 U	<0.000712 U	<0.000749 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00218 U	<0.00219 U	<0.00214 U	<0.00225 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00175 U	<0.00175 U	<0.00171 U	<0.0018 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00175 U	<0.00175 U	<0.00171 U	<0.0018 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00175 U	<0.00175 U	<0.00171 U	<0.0018 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0146 U	<0.0146 U	<0.0142 U	<0.015 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00175 U	<0.00175 U	<0.00171 U	<0.0018 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00109 U	<0.0011 U	<0.00107 U	<0.00112 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000728 U	<0.000731 U	<0.000712 U	<0.000749 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000728 U	<0.000731 U	<0.000712 U	<0.000749 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00218 U	<0.00219 U	<0.00214 U	<0.00225 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00175 U	<0.00175 U	<0.00171 U	<0.0018 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000728 U	<0.000731 U	<0.000712 U	<0.000749 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00218 U	<0.00219 U	<0.00214 U	<0.00225 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000874 U	<0.000877 U	<0.000854 U	<0.000899 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00328 U	<0.00329 U	<0.0032 U	<0.00337 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00328 U	<0.00329 U	<0.0032 U	<0.00337 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0328 U	<0.0329 U	<0.032 U	<0.0337 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.182 U	<0.183 U	<0.183 U	<0.195 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.182 U	<0.183 U	<0.183 U	<0.195 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.182 U	<0.183 U	<0.183 U	<0.195 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0364 U	<0.0356 U	<0.0351 U	<0.0383 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0364 U	<0.0356 U	<0.0351 U	<0.0383 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0364 U	<0.0356 U	<0.0351 U	<0.0383 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0364 U	<0.0356 U	<0.0351 U	<0.0383 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0364 U	<0.0356 U	<0.0351 U	<0.0383 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	0.0226 J	0.0166 J	0.0154 J	<0.0383 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.0284 J	0.0185 J	0.0348 J	0.0126 J
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0364 U	<0.0356 U	<0.0351 U	<0.0383 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0364 U	<0.0356 U	<0.0351 U	<0.0383 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.051 J	0.0351 J	0.0502 J	0.0126 J
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	2,930	8,430	6,420	3,280
Antimony	7440-36-0	NS	NS	mg/kg	0.884 J	0.407 J	1.9 J	0.899 J
Arsenic	7440-38-2	**13**	16	mg/kg	**14.5**	**18.4**	**15.6**	**33.5**
Barium	7440-39-3	**350**	400	mg/kg	124	136	121	106
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.529	6.26	**8.64**	0.827
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.217 J	<0.865 U	<0.828 U	<0.899 U
Calcium	7440-70-2	NS	NS	mg/kg	95,900	53,900 J	28,900 J	21,500
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.888 U	<0.882 U	<0.881 U	<0.934 UJ
Chromium, Total	7440-47-3	NS	NS	mg/kg	12.2	63.7	65.8	23.9
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	12	**64**	**66**	24
Cobalt	7440-48-4	NS	NS	mg/kg	7.97	30.5	40.3	7.73
Copper	7440-50-8	**50**	270	mg/kg	**88.1**	**471**	**529**	**150**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	15,800	32,200	30,400	27,400
Lead	7439-92-1	**63**	400	mg/kg	**221**	**330**	**385**	**284**
Magnesium	7439-95-4	NS	NS	mg/kg	42,600	23,300 J	13,300 J	9,840
Manganese	7439-96-5	1600	2000	mg/kg	166	346	274	164
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.656**	**0.249**	**0.248**	**1.02**
Nickel	7440-02-0	**30**	310	mg/kg	15.4	**56.5**	**66.8**	16.1
Potassium	7440-09-7	NS	NS	mg/kg	431	1,240	980	570
Selenium	7782-49-2	**3.9**	180	mg/kg	1.1 J	0.909 J	0.43 J	0.881 J
Silver	7440-22-4	2	180	mg/kg	<0.867 U	<0.865 U	<0.828 U	<0.899 U
Sodium	7440-23-5	NS	NS	mg/kg	272	816	1,120	270
Thallium	7440-28-0	NS	NS	mg/kg	<1.73 U	<1.73 U	<1.66 U	<1.8 U
Vanadium	7440-62-2	NS	NS	mg/kg	19.5	36.6	31.9	22.7
Zinc	7440-66-6	**109**	10000	mg/kg	**326**	**2,990**	**3,150**	**606**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	90.1	90.7	90.8	85.6
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000256 U	<0.000257 U	<0.000249 U	<0.00028 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000511 U	<0.000514 U	0.000037 J	<0.00056 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.000256 U	<0.000257 U	<0.000249 U	<0.00028 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000256 U	<0.000257 U	<0.000249 U	<0.00028 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000256 U	<0.000257 U	<0.000249 U	<0.00028 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	<0.000256 U	<0.000257 U	<0.000249 U	<0.00028 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000511 UJ	<0.000514 U	<0.000498 U	<0.00056 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	<0.000256 U	<0.000257 U	<0.000249 U	0.000559
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000053 J	0.0002 J	0.000198 J	<0.00028 U
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000511 U	<0.000514 U	0.000055 J	<0.00056 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000511 U	<0.000514 U	<0.000498 U	<0.00056 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000053 J	0.0002 J	0.000198 J	0.000559

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP12	EP13	EP14	EP15
				Sample Name	EP12_2	EP13_2	EP14_2	EP15_2
				Sample Date	08/24/2021	08/04/2021	08/04/2021	10/20/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0043 U	<0.0025 U	<0.0038 U	<0.0045 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	0.0026
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.11 U	<0.067 U	<0.1 U	<0.12 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.014 U	<0.0084 U	<0.013 U	<0.015 UJ
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.014 U	<0.0084 U	<0.013 U	<0.015 UJ
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0057 U	<0.0034 U	<0.0051 U	<0.0061 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0057 U	<0.0034 U	<0.0051 U	<0.0061 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.014 U	<0.0084 U	<0.013 U	<0.015 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0021 U	<0.0012 U	0.00018 J	<0.0023 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0057 U	<0.0034 U	<0.0051 U	<0.0061 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.014 U	<0.0084 U	<0.013 U	<0.015 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0057 U	<0.0034 U	<0.0051 U	<0.0061 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.014 U	<0.0084 UJ	<0.013 UJ	<0.015 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.014 U	<0.0084 U	<0.013 U	<0.015 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0071 U	<0.0042 U	<0.0064 U	<0.0076 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0057 U	<0.0034 U	<0.0051 U	<0.0061 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0028 U	<0.0017 U	<0.0025 U	<0.003 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0021 U	<0.0012 U	<0.0019 U	<0.0023 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0071 U	<0.0042 U	<0.0064 U	<0.0076 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00071 U	<0.00042 U	<0.00064 U	<0.00076 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0057 U	<0.0034 U	<0.0051 U	<0.0061 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.014 U	<0.0084 U	<0.013 U	<0.015 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0014 U	<0.00084 U	<0.0013 U	<0.0015 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	**Location**	EP12	EP13	EP14	EP15
				Sample Name	EP12_2	EP13_2	EP14_2	EP15_2
				Sample Date	08/24/2021	08/04/2021	08/04/2021	10/20/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.19 U	<0.17 U	0.042 J	0.036 J
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.028 U	<0.026 U	<0.026 U	<0.027 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.1 U	<0.1 U	<0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.17 U	<0.15 U	<0.16 U	<0.16 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.9 U	<0.82 U	<0.84 U	<0.87 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.1 J	0.28	0.42	0.34
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.4 U	<0.37 U	<0.38 U	<0.39 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<0.27 U	<0.25 U	<0.25 U	0.039 J
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.49 U	<0.45 U	<0.46 U	<0.47 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.26 U	<0.24 U	<0.24 U	<0.25 U
Acenaphthene	83-32-9	20	100	mg/kg	0.16	0.19	0.052 J	0.31
Acenaphthylene	208-96-8	100	100	mg/kg	0.12 J	0.12 J	0.1 J	0.12 J
Acetophenone	98-86-2	NS	NS	mg/kg	<0.19 U	0.03 J	<0.18 U	<0.18 U
Anthracene	120-12-7	100	100	mg/kg	0.71	0.49	0.23	0.69
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**3.7**	**1.3**	0.58	**1.6**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**3**	**1.1**	0.63	**1.4**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**4.1**	**1.5**	0.79	**2**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	1.8	0.77	0.57	1
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**1**	0.39	0.27	0.52
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.61 U	<0.56 U	<0.57 U	<0.59 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<0.43 U	0.069 J	0.067 J	0.096 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.18 U	<0.19 U	<0.2 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.17 U	<0.15 U	<0.16 U	<0.16 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.21 U	<0.21 U	<0.22 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.12 J	0.3	0.23	0.21
Carbazole	86-74-8	NS	NS	mg/kg	0.16 J	0.17	0.058 J	0.27
Chrysene	218-01-9	**1**	3.9	mg/kg	**3.2**	**1.2**	0.65	**1.6**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.44**	0.18	0.12	0.32
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.13 J	0.19	0.11 J	0.34
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	0.12 J	0.035 J	<0.18 U	0.042 J
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
Fluoranthene	206-44-0	**100**	100	mg/kg	5.7	2.5	0.89	3
Fluorene	86-73-7	30	100	mg/kg	0.19	0.26	0.11 J	0.47
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.1 U	<0.1 U	<0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.54 U	<0.49 U	<0.5 U	<0.52 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.15 U	<0.14 U	<0.14 U	<0.14 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**2**	**0.83**	**0.6**	**1.1**
Isophorone	78-59-1	NS	NS	mg/kg	<0.17 U	<0.15 U	<0.16 U	<0.16 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.19	0.33	0.26	0.56
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.17 U	<0.15 U	<0.16 U	<0.16 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.15 U	0.053 J	0.07 J	<0.14 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.15 U	<0.14 U	<0.14 U	<0.14 U
Phenanthrene	85-01-8	**100**	100	mg/kg	2.8	2	0.68	2.7
Phenol	108-95-2	**0.33**	100	mg/kg	<0.19 U	<0.17 U	<0.18 U	<0.18 U
Pyrene	129-00-0	100	100	mg/kg	5.4	2.3	0.91	2.7
Total SVOCs	SVOCs	NS	500	mg/kg	35.14	16.587	8.439	21.463

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45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP12	EP13	EP14	EP15
				Sample Name	EP12_2	EP13_2	EP14_2	EP15_2
				Sample Date	08/24/2021	08/04/2021	08/04/2021	10/20/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00178 U	0.00126 J	0.00329	**0.0123**
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	**0.00618**	0.00105 J	0.00139 J	**0.0052**
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.00752**	<0.00302 U	<0.00316 U	**0.0108**
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00178 U	<0.00161 U	<0.00168 U	<0.00173 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.00074 U	<0.000671 U	<0.000701 U	<0.000721 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	0.00165 J	<0.00201 U	0.001 J	<0.00216 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00178 U	<0.00161 U	<0.00168 U	<0.00173 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00178 U	<0.00161 U	<0.00168 U	<0.00173 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00178 U	<0.00161 U	<0.00168 U	<0.00173 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0148 U	<0.0134 U	0.0267	<0.0144 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00178 U	<0.00161 U	<0.00168 U	<0.00173 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00111 U	<0.00101 U	<0.00105 U	<0.00108 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.00074 U	<0.000671 U	<0.000701 U	<0.000721 U
Endrin	72-20-8	0.014	11	mg/kg	<0.00074 U	<0.000671 U	<0.000701 U	<0.000721 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00222 U	<0.00201 U	<0.0021 U	<0.00216 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00178 U	<0.00161 U	<0.00168 U	<0.00173 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.00074 U	<0.000671 U	<0.000701 U	<0.000721 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	0.00107 J	<0.00201 U	0.00217	<0.00216 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000888 U	<0.000805 U	<0.000842 U	<0.000865 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00333 U	<0.00302 U	<0.00316 U	<0.00324 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00333 U	<0.00302 U	<0.00316 U	<0.00324 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0333 U	<0.0302 U	<0.0316 U	<0.0324 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.188 U	<0.174 U	<0.177 U	<0.181 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.188 U	<0.174 U	<0.177 U	<0.181 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.188 U	<0.174 U	<0.177 U	<0.181 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.0104 J	0.0114 J	0.0371	<0.0358 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0371 U	<0.0336 U	<0.0342 U	<0.0358 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0104 J	0.0114 J	0.0371	<0.0358 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	4,840	1,660	2,570	4,080
Antimony	7440-36-0	NS	NS	mg/kg	<4.3 U	1.38 J	0.882 J	0.426 J
Arsenic	7440-38-2	**13**	16	mg/kg	**14.5**	8.16	8.38	10.6
Barium	7440-39-3	**350**	400	mg/kg	237	330	190	111
Beryllium	7440-41-7	**7.2**	72	mg/kg	2.98	0.247 J	0.324 J	0.895
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	<0.86 U	0.167 J	0.259 J	0.644 J
Calcium	7440-70-2	NS	NS	mg/kg	42,000	179,000	148,000	26,800
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.916 U	<0.845 U	<0.856 U	<0.875 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	31.9	5.21	8.38	22.2
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	**32**	5.2	8.4	22
Cobalt	7440-48-4	NS	NS	mg/kg	16.6	3.03	4.04	8.62
Copper	7440-50-8	**50**	270	mg/kg	**204**	33.2	**52.8**	**114**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	24,600	7,580	8,870	14,800
Lead	7439-92-1	**63**	400	mg/kg	**639**	**101**	**264**	**414**
Magnesium	7439-95-4	NS	NS	mg/kg	18,800	87,300	50,600	11,900
Manganese	7439-96-5	1600	2000	mg/kg	222	144	146	172
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.299**	0.064 J	0.117	**0.232**
Nickel	7440-02-0	**30**	310	mg/kg	30	6.34	8.61	19.2
Potassium	7440-09-7	NS	NS	mg/kg	1,250	362	461	601
Selenium	7782-49-2	**3.9**	180	mg/kg	0.74 J	1.19 J	0.785 J	0.979 J
Silver	7440-22-4	2	180	mg/kg	<0.86 U	<0.796 U	<0.809 U	<0.836 U
Sodium	7440-23-5	NS	NS	mg/kg	241	196	251	258
Thallium	7440-28-0	NS	NS	mg/kg	<1.72 U	<1.59 U	<1.62 U	<1.67 U
Vanadium	7440-62-2	NS	NS	mg/kg	24.7	13.8	15	17.5
Zinc	7440-66-6	**109**	10000	mg/kg	**1,550**	**153**	**243**	**519**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	87.3	94.7	93.5	91.4
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000264 U	<0.000243 U	<0.000257 U	<0.000262 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	0.000031 J	<0.000486 U	<0.000514 U	<0.000523 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.000154 J	<0.000243 U	<0.000257 U	<0.000262 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000264 U	<0.000243 U	<0.000257 U	<0.000262 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000264 U	<0.000243 U	<0.000257 U	<0.000262 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000066 J	<0.000486 U	<0.000514 U	<0.000523 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000128 J	<0.000243 U	0.0001 J	<0.000262 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	**0.00153**	<0.000243 U	0.000557	<0.000262 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000132 J	<0.000243 U	0.000324	0.000115 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	0.000057 J	<0.000486 U	<0.000514 U	<0.000523 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000529 U	<0.000486 U	<0.000514 U	<0.000523 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.00166 J	<0.000243 U	0.000881	0.000115 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP16	EP17	EP18	EP19
				Sample Name	EP16_8	EP17_2	EP18_2	EP19_2
				Sample Date	08/30/2021	08/25/2021	08/24/2021	08/05/2021
				Sample Depth	8	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0053 U	<0.0035 U	<0.0057 U	<0.0033 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.14 U	<0.094 U	<0.15 U	<0.088 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.018 UJ	<0.012 U	<0.019 U	<0.011 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Acetone	67-64-1	**0.05**	100	mg/kg	0.014 J	<0.012 U	<0.019 U	<0.011 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0071 U	<0.0047 U	<0.0076 U	<0.0044 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0071 U	<0.0047 U	<0.0076 U	<0.0044 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.018 U	<0.012 U	<0.019 U	<0.011 UJ
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0027 U	<0.0018 U	<0.0029 U	<0.0016 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0071 U	<0.0047 U	<0.0076 U	<0.0044 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.018 U	<0.012 U	<0.019 U	<0.011 UJ
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0071 U	<0.0047 U	<0.0076 U	<0.0044 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.018 U	<0.012 U	<0.019 U	<0.011 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.018 U	<0.012 U	<0.019 U	<0.011 UJ
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0089 U	<0.0059 U	<0.0096 U	<0.0055 UJ
Naphthalene	91-20-3	12	100	mg/kg	<0.0071 U	<0.0047 U	<0.0076 U	<0.0044 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0036 U	<0.0024 U	<0.0038 U	<0.0022 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0027 U	<0.0018 U	<0.0029 U	<0.0016 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0089 U	<0.0059 U	<0.0096 U	<0.0055 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00089 U	<0.00059 U	<0.00096 U	<0.00055 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0071 U	<0.0047 U	<0.0076 U	<0.0044 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.018 U	<0.012 U	<0.019 U	<0.011 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0018 U	<0.0012 U	<0.0019 U	<0.0011 UJ

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP16	EP17	EP18	EP19
				Sample Name	EP16_8	EP17_2	EP18_2	EP19_2
				Sample Date	08/30/2021	08/25/2021	08/24/2021	08/05/2021
				Sample Depth	8	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.027 U	<0.029 U	<0.029 U	<0.026 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.11 U	<0.12 U	<0.1 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.17 U	<0.15 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.87 U	<0.92 U	<0.92 U	<0.82 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.25	0.13 J	0.29	0.049 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.39 U	<0.41 U	<0.41 U	<0.37 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	0.038 J	0.047 J	0.049 J	<0.24 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.47 U	<0.5 U	<0.5 U	<0.44 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.25 U	<0.27 U	<0.27 U	<0.24 U
Acenaphthene	83-32-9	20	100	mg/kg	0.36	0.24	0.96	0.036 J
Acenaphthylene	208-96-8	100	100	mg/kg	0.21	0.058 J	0.31	<0.14 U
Acetophenone	98-86-2	NS	NS	mg/kg	<0.18 U	0.039 J	<0.19 U	<0.17 U
Anthracene	120-12-7	100	100	mg/kg	0.86	0.89	2	0.086 J
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**2.2**	**2**	**5.3**	0.22
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**2.3**	**1.9**	**4.7**	0.2
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**3**	**2.5**	**6.3**	0.27
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	1.6	1.3	2.7	0.13 J
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**1**	**0.82**	**1.5**	0.062 J
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.58 U	<0.62 U	<0.62 U	<0.55 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	0.073 J	0.044 J	0.082 J	<0.39 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.21 U	<0.21 U	<0.18 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.17 U	<0.15 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.23 U	<0.23 U	<0.2 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.22	0.1 J	<0.19 U	0.076 J
Carbazole	86-74-8	NS	NS	mg/kg	0.4	0.27	0.92	0.033 J
Chrysene	218-01-9	**1**	3.9	mg/kg	**2.4**	**1.9**	**4.6**	0.21
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.39**	0.29	**0.6**	0.03 J
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.34	0.22	0.61	0.036 J
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Fluoranthene	206-44-0	**100**	100	mg/kg	4.4	4.2	13	0.42
Fluorene	86-73-7	30	100	mg/kg	0.38	0.32	0.95	0.042 J
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.11 U	<0.12 U	<0.1 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.52 U	<0.55 U	<0.55 U	<0.49 UJ
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.14 U	<0.15 U	<0.15 U	<0.14 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**1.8**	**1.4**	**3**	0.13 J
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.17 U	<0.15 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.43	0.25	0.52	0.063 J
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.17 U	<0.17 U	<0.15 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.14 U	<0.15 U	<0.15 U	<0.14 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.14 U	<0.15 U	<0.15 U	<0.14 U
Phenanthrene	85-01-8	**100**	100	mg/kg	3.2	3.1	10	0.33
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	<0.19 U	<0.19 U	<0.17 U
Pyrene	129-00-0	100	100	mg/kg	4	3.6	11	0.4
Total SVOCs	SVOCs	NS	500	mg/kg	29.851	25.618	69.391	2.823

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

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				Sample Name	EP16_8	EP17_2	EP18_2	EP19_2
				Sample Date	08/30/2021	08/25/2021	08/24/2021	08/05/2021
				Sample Depth	8	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00172 U	<0.00179 U	<0.00911 U	<0.0081 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	0.00139 J	<0.00179 U	<0.00911 U	<0.0081 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	<0.00322 U	<0.00336 U	<0.0171 U	<0.0152 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00172 U	<0.00179 U	<0.00911 U	<0.0081 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000715 U	<0.000747 U	<0.0038 U	<0.00337 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00214 U	<0.00224 U	<0.0114 U	<0.0101 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00172 U	<0.00179 U	<0.00911 U	<0.0081 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00172 U	<0.00179 U	<0.00911 U	<0.0081 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00172 U	<0.00179 U	<0.00911 U	<0.0081 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0143 U	<0.0149 U	<0.0759 U	<0.0675 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00172 U	<0.00179 U	<0.00911 U	<0.0081 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00107 U	<0.00112 U	<0.00569 U	<0.00506 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000715 U	<0.000747 U	<0.0038 U	<0.00337 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000715 U	<0.000747 U	<0.0038 U	<0.00337 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00214 U	<0.00224 U	<0.0114 U	<0.0101 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00172 U	<0.00179 U	<0.00911 U	<0.0081 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000715 U	<0.000747 U	<0.0038 U	<0.00337 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00214 U	<0.00224 U	<0.0114 U	<0.0101 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000858 U	<0.000896 U	<0.00456 U	<0.00405 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00322 U	<0.00336 U	<0.0171 U	<0.0152 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00322 U	<0.00336 U	<0.0171 U	<0.0152 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0322 U	<0.0336 U	<0.171 U	<0.152 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.18 U	<0.192 U	<0.194 U	<0.17 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.18 U	<0.192 U	<0.194 U	<0.17 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.18 U	<0.192 U	<0.194 U	<0.17 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0362 U	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0362 U	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0362 U	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0362 U	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0362 U	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	0.00797 J	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.00981 J	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0362 U	<0.0389 U	<0.0374 U	<0.0333 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0362 U	<0.0389 U	<0.0374 U	<0.0333 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0178 J	<0.0389 U	<0.0374 U	<0.0333 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	3,740	5,310	3,980	1,070
Antimony	7440-36-0	NS	NS	mg/kg	0.905 J	<4.53 U	1.1 J	<3.89 U
Arsenic	7440-38-2	**13**	16	mg/kg	13 J	10.6	12.8	8.29
Barium	7440-39-3	**350**	400	mg/kg	102	**405**	108	17.9
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.313 J	4.65	0.349 J	0.226 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	<0.846 U	<0.906 U	0.286 J	0.086 J
Calcium	7440-70-2	NS	NS	mg/kg	44,300	28,400	33,100	150,000
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.881 U	0.304 J	<0.933 U	<0.825 UJ
Chromium, Total	7440-47-3	NS	NS	mg/kg	13.1	42.8	9.97	4.01
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	13	**42 J**	10	4
Cobalt	7440-48-4	NS	NS	mg/kg	4.91	27.8	7.16	2.55
Copper	7440-50-8	**50**	270	mg/kg	**75.2 J**	**926**	**136**	16
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	15,800	27,300	15,600	7,380
Lead	7439-92-1	**63**	400	mg/kg	**254 J**	**1,820**	**307**	21.9
Magnesium	7439-95-4	NS	NS	mg/kg	23,400	6,090	16,000	86,600
Manganese	7439-96-5	1600	2000	mg/kg	164 J	261	378	126
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.394 J**	0.152	**0.79**	<0.065 U
Nickel	7440-02-0	**30**	310	mg/kg	11.7	**58.1**	15.6	5.36
Potassium	7440-09-7	NS	NS	mg/kg	523	775	485	331
Selenium	7782-49-2	**3.9**	180	mg/kg	0.677 J	0.507 J	<1.79 U	0.623 J
Silver	7440-22-4	2	180	mg/kg	<0.846 U	<0.906 U	<0.895 U	<0.779 U
Sodium	7440-23-5	NS	NS	mg/kg	221	290	86.2 J	168
Thallium	7440-28-0	NS	NS	mg/kg	<1.69 U	<1.81 U	<1.79 U	<1.56 U
Vanadium	7440-62-2	NS	NS	mg/kg	19.2	25.8	37.9	7.94
Zinc	7440-66-6	**109**	10000	mg/kg	**132 J**	**3,080**	**288**	28.1
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	90.8	85.6	85.7	97
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000506 U	<0.000535 UJ	<0.00214 U	<0.000499 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000506 U	<0.000535 UJ	<0.000528 UJ	<0.000499 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000253 U	<0.000267 UJ	<0.000264 UJ	<0.00025 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000506 U	<0.000535 U	0.00004 J	<0.000499 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000506 U	<0.000535 U	<0.000528 U	<0.000499 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.000253 U	<0.000267 U	0.000082 J	<0.00025 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000506 U	<0.000535 U	<0.000528 U	<0.000499 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000506 U	<0.000535 U	<0.000528 U	<0.000499 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000253 U	<0.000267 U	<0.000264 UJ	<0.00025 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000253 U	<0.000267 UJ	<0.000264 UJ	<0.00025 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000506 U	<0.000535 U	0.000069 J	<0.000499 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	<0.000253 U	<0.000267 UJ	0.000122 J	<0.00025 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000506 U	<0.000535 UJ	<0.000528 U	<0.000499 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	<0.000253 U	<0.000267 UJ	**0.000906 J**	<0.00025 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000118 J	<0.000267 UJ	0.000108 J	<0.00025 U
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000506 U	<0.000535 U	0.000064 J	<0.000499 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000506 U	<0.000535 UJ	<0.00214 U	<0.000499 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000506 U	<0.000535 U	<0.00214 U	<0.000499 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000506 U	<0.000535 U	0.000056 J	<0.000499 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000506 U	<0.000535 U	<0.000528 U	<0.000499 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000506 U	<0.000535 U	<0.000528 U	<0.000499 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000118 J	<0.000267 U	0.00101 J	<0.00025 U

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Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
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Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP20	EP21	EP22	EP23
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				Sample Date	08/09/2021	10/20/2021	08/30/2021	08/31/2021
				Sample Depth	4	2	8	8
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0053 UJ	<0.0038 U	<0.0064 U	<0.0043 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.14 UJ	<0.1 U	<0.17 U	<0.11 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.018 UJ	<0.012 UJ	<0.021 UJ	<0.014 UJ
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.018 UJ	<0.012 UJ	<0.021 U	<0.014 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0071 UJ	<0.005 U	<0.0085 U	<0.0057 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0071 UJ	<0.005 U	<0.0085 U	<0.0057 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.018 UJ	<0.012 U	<0.021 U	<0.014 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0027 UJ	<0.0019 U	<0.0032 U	<0.0021 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0071 UJ	<0.005 U	<0.0085 U	<0.0057 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.018 UJ	<0.012 U	<0.021 U	<0.014 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0071 UJ	<0.005 U	<0.0085 U	<0.0057 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.018 UJ	<0.012 U	<0.021 U	<0.014 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.018 UJ	<0.012 U	<0.021 U	<0.014 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0089 UJ	<0.0062 U	<0.011 U	<0.0072 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0071 UJ	<0.005 U	<0.0085 U	<0.0057 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0036 UJ	<0.0025 U	<0.0042 U	<0.0029 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0027 UJ	<0.0019 U	<0.0032 U	<0.0021 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0089 UJ	<0.0062 U	<0.011 U	<0.0072 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00089 UJ	<0.00062 U	<0.0011 U	<0.00072 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0071 UJ	<0.005 U	<0.0085 U	<0.0057 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.018 UJ	<0.012 U	<0.021 U	<0.014 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0018 UJ	<0.0012 U	<0.0021 U	<0.0014 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs					
				Location	EP20	EP21	EP22	EP23
				Sample Name	EP20_4	EP21_2	EP22_8	EP23_8
				Sample Date	08/09/2021	10/20/2021	08/30/2021	08/31/2021
				Sample Depth	4	2	8	8
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.32 U	<0.026 U	<0.026 U	<0.028 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<1.3 U	<0.1 U	<0.1 U	<0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<1.9 U	<0.15 U	<0.16 U	<0.17 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<10 U	<0.82 U	<0.83 U	<0.89 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.41 J	0.47	0.2 J	0.14 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<4.7 U	<0.37 U	<0.37 U	<0.4 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<3.1 U	0.067 J	<0.25 U	0.033 J
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<5.6 U	<0.44 U	<0.45 U	<0.48 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<3 U	<0.24 U	<0.24 U	<0.26 U
Acenaphthene	83-32-9	20	100	mg/kg	0.33 J	0.81	0.35	0.31
Acenaphthylene	208-96-8	100	100	mg/kg	<1.7 U	0.29	0.17	0.28
Acetophenone	98-86-2	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Anthracene	120-12-7	100	100	mg/kg	0.76 J	1.8	0.85	0.87
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**2.1**	**4**	**2.4**	**2.3**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**1.9**	**3.6**	**2.4**	**2.3**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**2.7**	**5.1**	**3.2**	**2.8**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	1.2 J	2.7	1.7	1.4
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**0.81 J**	0.78	**0.86**	**0.99**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<7 U	<0.55 U	<0.56 U	<0.6 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<4.9 U	0.15 J	0.058 J	0.065 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<2.3 U	<0.18 U	<0.19 U	<0.2 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<1.9 U	<0.15 U	<0.16 U	<0.17 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<2.6 U	<0.2 U	<0.21 U	<0.22 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	<2.2 U	0.27	<0.17 U	<0.18 U
Carbazole	86-74-8	NS	NS	mg/kg	0.38 J	0.82	0.4	0.36
Chrysene	218-01-9	**1**	3.9	mg/kg	**2.3**	**3.5**	**2.6**	**2.3**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	0.3 J	**0.84**	**0.4**	**0.35**
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.31 J	0.71	0.29	0.29
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Fluoranthene	206-44-0	**100**	100	mg/kg	4.5	6.5	4.5	4.2
Fluorene	86-73-7	30	100	mg/kg	0.54 J	0.93	0.4	0.42
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<1.3 U	<0.1 U	<0.1 U	<0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<6.2 U	<0.49 U	<0.5 U	<0.53 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<1.7 U	<0.14 U	<0.14 U	<0.15 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**1.4 J**	**2.9**	**1.9**	**1.6**
Isophorone	78-59-1	NS	NS	mg/kg	<1.9 U	<0.15 U	<0.16 U	<0.17 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.56 J	0.79	0.46	0.32
Nitrobenzene	98-95-3	NS	NS	mg/kg	<1.9 U	<0.15 U	<0.16 U	<0.17 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<1.7 U	<0.14 U	<0.14 U	<0.15 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<1.7 U	<0.14 U	<0.14 U	<0.15 U
Phenanthrene	85-01-8	**100**	100	mg/kg	3.7	5.7	3.5	3.3
Phenol	108-95-2	**0.33**	100	mg/kg	<2.2 U	<0.17 U	<0.17 U	<0.18 U
Pyrene	129-00-0	100	100	mg/kg	3.9	6	4.2	3.9
Total SVOCs	SVOCs	NS	500	mg/kg	28.1	48.727	30.838	28.528

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP20	EP21	EP22	EP23
				Sample Name	EP20_4	EP21_2	EP22_8	EP23_8
				Sample Date	08/09/2021	10/20/2021	08/30/2021	08/31/2021
				Sample Depth	4	2	8	8
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	**0.00422**	**0.00517**	<0.00163 U	<0.00172 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00402 U	<0.00163 U	<0.00163 U	<0.00172 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.00793**	<0.00306 U	<0.00305 U	<0.00323 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00402 U	<0.00163 U	<0.00163 U	<0.00172 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.00168 U	<0.00068 U	<0.000679 U	<0.000717 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00503 U	<0.00204 U	<0.00204 U	<0.00215 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00402 U	<0.00163 U	<0.00163 U	<0.00172 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00402 U	<0.00163 U	<0.00163 U	<0.00172 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00402 U	<0.00163 U	<0.00163 U	<0.00172 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0335 U	<0.0136 U	<0.0136 U	<0.0143 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00402 U	<0.00163 U	<0.00163 U	<0.00172 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00252 U	<0.00102 U	<0.00102 U	<0.00108 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.00168 U	<0.00068 U	<0.000679 U	<0.000717 U
Endrin	72-20-8	0.014	11	mg/kg	<0.00168 U	<0.00068 U	<0.000679 U	<0.000717 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00503 UJ	<0.00204 U	<0.00204 U	<0.00215 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00402 U	<0.00163 U	<0.00163 U	<0.00172 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.00168 U	<0.00068 U	<0.000679 U	<0.000717 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	0.00388 J	<0.00204 U	<0.00204 U	<0.00215 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.00201 U	<0.000817 U	<0.000814 U	<0.00086 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00755 U	<0.00306 U	<0.00305 U	<0.00323 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00755 U	<0.00306 U	<0.00305 U	<0.00323 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0755 U	<0.0306 U	<0.0305 U	<0.0323 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.215 U	<0.172 U	<0.171 U	<0.183 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.215 U	<0.172 U	<0.171 U	<0.183 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.215 U	<0.172 U	<0.171 U	<0.183 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0428 U	<0.0332 U	<0.034 U	<0.0368 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0428 U	<0.0332 U	<0.034 U	<0.0368 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0428 U	<0.0332 U	<0.034 U	<0.0368 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0428 U	<0.0332 U	<0.034 U	<0.0368 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	0.00804 J	<0.0332 U	<0.034 U	<0.0368 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	0.0112 J	0.0141 J	<0.034 U	<0.0368 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.0153 J	0.0179 J	<0.034 U	<0.0368 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0428 U	<0.0332 U	<0.034 U	<0.0368 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	0.0103 J	<0.0332 U	<0.034 U	<0.0368 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0448 J	0.032 J	<0.034 U	<0.0368 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	2,550	4,150	3,130	5,400
Antimony	7440-36-0	NS	NS	mg/kg	0.846 J	<4.07 U	1.6 J	2.25 J
Arsenic	7440-38-2	**13**	16	mg/kg	**21.3**	11.7	**14.8**	6.97
Barium	7440-39-3	**350**	400	mg/kg	74.3	139	268	87.5
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.252 J	0.456	0.306 J	0.3 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.342 J	0.765 J	0.629 J	<0.884 U
Calcium	7440-70-2	NS	NS	mg/kg	43,900	36,200	1,380	5,420
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<1.05 U	<0.832 U	**1.78**	<0.899 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	7.83	29.8	14.2	15.6
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	7.8	30	12	16
Cobalt	7440-48-4	NS	NS	mg/kg	3.36	6.92	5.38	6.25
Copper	7440-50-8	**50**	270	mg/kg	39	**82.3**	**98.4**	**74.2**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	9,620	15,800	18,400	15,200
Lead	7439-92-1	**63**	400	mg/kg	**132**	**266**	**542**	**284**
Magnesium	7439-95-4	NS	NS	mg/kg	20,800	15,700	947	2,520
Manganese	7439-96-5	1600	2000	mg/kg	104	215	113	237
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.181**	**0.482**	**0.374**	**0.846**
Nickel	7440-02-0	**30**	310	mg/kg	7.12	13.3	12.7	18.4
Potassium	7440-09-7	NS	NS	mg/kg	513	680	483	764
Selenium	7782-49-2	**3.9**	180	mg/kg	1.44 J	1.17 J	1.18 J	0.548 J
Silver	7440-22-4	2	180	mg/kg	<1.01 U	<0.814 U	<0.807 U	<0.884 U
Sodium	7440-23-5	NS	NS	mg/kg	156 J	277	<161 U	86.2 J
Thallium	7440-28-0	NS	NS	mg/kg	<2.02 U	<1.63 U	<1.61 U	<1.77 U
Vanadium	7440-62-2	NS	NS	mg/kg	12.4	18.8	21.5	20.8
Zinc	7440-66-6	**109**	10000	mg/kg	82.3	**278**	**460**	**161**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	76.4	96.1	95.8	89
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000299 U	<0.000254 U	<0.000242 U	<0.000273 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000598 U	0.000026 J	<0.000484 U	0.000025 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.000299 U	<0.000254 U	<0.000242 U	<0.000273 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000299 U	<0.000254 U	<0.000242 U	<0.000273 UJ
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000299 U	<0.000254 U	<0.000242 U	<0.000273 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	<0.000299 U	<0.000254 U	<0.000242 U	<0.000273 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	<0.000299 U	<0.000254 U	<0.000242 U	<0.000273 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000063 J	0.000096 J	0.000162 J	0.000137 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000598 U	<0.000508 U	<0.000484 U	<0.000547 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000063 J	0.000096 J	0.000162 J	0.000137 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP24	EP25	EP26	EP27
				Sample Name	EP24_2	EP25_2	EP26_2	EP27_2
				Sample Date	08/31/2021	08/17/2021	08/17/2021	11/03/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0044 U	<0.0041 U	<0.0035 U	<0.0098 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.12 U	<0.11 U	<0.094 U	<0.26 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.014 UJ	<0.014 U	<0.012 U	<0.033 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.014 U	0.0085 J	0.0088 J	<0.033 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0058 U	<0.0054 U	<0.0047 U	<0.013 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0058 U	<0.0054 U	<0.0047 U	<0.013 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.014 U	<0.014 U	<0.012 U	<0.033 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0022 U	<0.002 U	<0.0018 U	<0.0049 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0058 U	<0.0054 U	<0.0047 U	<0.013 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.014 U	<0.014 U	<0.012 U	<0.033 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0058 U	<0.0054 U	<0.0047 U	<0.013 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.014 U	<0.014 U	<0.012 U	<0.033 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.014 U	<0.014 U	<0.012 U	<0.033 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0073 U	<0.0068 U	<0.0059 U	<0.016 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0058 U	<0.0054 U	<0.0047 U	<0.013 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0029 U	<0.0027 U	<0.0023 U	<0.0066 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0022 U	<0.002 U	<0.0018 U	<0.0049 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0073 U	<0.0068 U	<0.0059 U	<0.016 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00073 U	<0.00068 U	<0.00059 U	<0.0016 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0058 U	<0.0054 U	<0.0047 U	<0.013 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.014 U	<0.014 U	<0.012 U	<0.033 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0014 U	<0.0014 U	<0.0012 U	<0.0033 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	**Location**	EP24	EP25	EP26	EP27
				Sample Name	EP24_2	EP25_2	EP26_2	EP27_2
				Sample Date	08/31/2021	08/17/2021	08/17/2021	11/03/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.026 U	<0.031 U	<0.026 U	<0.14 UJ
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.1 U	<0.12 U	<0.1 U	<0.56 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.15 U	<0.18 U	<0.16 U	<0.84 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.82 U	<0.99 U	<0.85 U	<4.4 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.055 J	0.14 J	0.97	0.57 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.37 U	<0.44 U	<0.38 U	<2 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<0.25 U	<0.3 U	0.033 J	<1.3 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.44 U	<0.54 U	<0.46 U	<2.4 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.24 U	<0.29 U	<0.25 U	<1.3 U
Acenaphthene	83-32-9	20	100	mg/kg	<0.14 U	0.11 J	1.8	2.2
Acenaphthylene	208-96-8	100	100	mg/kg	0.051 J	0.057 J	0.18	0.77
Acetophenone	98-86-2	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Anthracene	120-12-7	100	100	mg/kg	0.14	0.34	4.2	4.9
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	0.4	**1.2**	**6.4**	**9**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	0.38	**1.2**	**5.4**	**9.3**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	0.5	**1.5**	**7.9**	**11**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	0.27	0.84	3.2	5.2
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	0.18	0.47	**1.6**	**3.8**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.55 U	<0.67 U	<0.57 U	<3 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<0.39 U	<0.47 U	0.33 J	0.22 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.18 U	<0.22 U	<0.19 U	<1 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.15 U	<0.18 U	<0.16 U	<0.84 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.2 U	<0.25 U	<0.21 U	<1.1 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.38	<0.2 U	0.1 J	<0.93 U
Carbazole	86-74-8	NS	NS	mg/kg	0.046 J	0.12 J	1.4	1.8
Chrysene	218-01-9	**1**	3.9	mg/kg	0.45	**1.2**	**5.4**	**8.4**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	0.062 J	0.19	**0.78**	**1.2**
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.041 J	0.14 J	2	1.4
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Fluoranthene	206-44-0	**100**	100	mg/kg	0.84	2.1	16	21
Fluorene	86-73-7	30	100	mg/kg	0.043 J	0.12 J	2.5	2.2
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.1 U	<0.12 U	<0.1 U	<0.56 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.49 U	<0.59 U	<0.5 U	<2.6 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.14 U	<0.16 U	<0.14 U	<0.74 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	0.28	**0.91**	**3.9**	**5.4**
Isophorone	78-59-1	NS	NS	mg/kg	<0.15 U	<0.18 U	<0.16 U	<0.84 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.07 J	0.24	1.8	0.92 J
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.15 U	<0.18 U	<0.16 U	<0.84 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.14 U	<0.16 U	<0.14 U	<0.74 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.14 U	<0.16 U	<0.14 U	<0.74 U
Phenanthrene	85-01-8	**100**	100	mg/kg	0.61	1.2	14	19
Phenol	108-95-2	**0.33**	100	mg/kg	<0.17 U	<0.2 U	<0.18 U	<0.93 U
Pyrene	129-00-0	100	100	mg/kg	0.76	2.3	13	18
Total SVOCs	SVOCs	NS	500	mg/kg	5.558	14.377	92.893	126.28

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP24	EP25	EP26	EP27
				Sample Name	EP24_2	EP25_2	EP26_2	EP27_2
				Sample Date	08/31/2021	08/17/2021	08/17/2021	11/03/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00162 U	0.00209 J	0.00192 J	<0.00178 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	0.00113 J	<0.00194 U	<0.00167 U	<0.00178 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	0.00316	<0.00365 U	<0.00314 U	<0.00333 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00162 U	<0.00194 U	<0.00167 U	<0.00178 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000674 U	<0.00081 U	<0.000698 U	<0.000741 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00202 U	<0.00243 U	<0.00209 U	<0.00222 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00162 U	<0.00194 U	<0.00167 U	<0.00178 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00162 U	<0.00194 U	<0.00167 U	<0.00178 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00162 U	<0.00194 U	<0.00167 U	<0.00178 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0135 U	<0.0162 U	<0.014 U	<0.0148 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00162 U	<0.00194 U	<0.00167 U	<0.00178 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00101 U	<0.00122 U	<0.00105 U	<0.00111 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000674 U	<0.00081 U	<0.000698 U	<0.000741 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000674 U	<0.00081 U	<0.000698 U	<0.000741 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00202 U	<0.00243 U	<0.00209 U	<0.00222 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00162 U	<0.00194 U	<0.00167 U	<0.00178 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000674 U	<0.00081 U	<0.000698 U	<0.000741 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00202 U	<0.00243 U	<0.00209 U	<0.00222 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000809 U	<0.000973 U	<0.000837 U	<0.000889 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00303 U	<0.00365 U	<0.00314 U	<0.00333 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00303 U	<0.00365 U	<0.00314 U	<0.00333 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0303 U	<0.0365 U	<0.0314 U	<0.0333 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.171 U	<0.203 U	<0.177 U	<0.187 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.171 U	<0.203 U	<0.177 U	<0.187 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.171 U	<0.203 U	<0.177 U	<0.187 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0335 U	<0.0406 U	<0.0334 U	<0.0355 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0335 U	<0.0406 U	<0.0334 U	<0.0355 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0335 U	<0.0406 U	<0.0334 U	<0.0355 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0335 U	<0.0406 U	<0.0334 U	<0.0355 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0335 U	<0.0406 U	<0.0334 U	<0.0355 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0335 U	0.0438	0.0104 J	<0.0355 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.0374	0.0283 J	<0.0334 U	<0.0355 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0335 U	<0.0406 U	<0.0334 U	<0.0355 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0335 U	<0.0406 U	<0.0334 U	<0.0355 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0374	0.0721 J	0.0104 J	<0.0355 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	2,800	5,050	5,480	4,810
Antimony	7440-36-0	NS	NS	mg/kg	0.994 J	1.97 J	0.824 J	1.57 J
Arsenic	7440-38-2	**13**	16	mg/kg	8.32	**33.4**	**13.2**	7.2
Barium	7440-39-3	**350**	400	mg/kg	66.3	119	113	94.2
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.232 J	0.494	0.351 J	<0.428 U
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.168 J	0.703 J	0.392 J	1.21
Calcium	7440-70-2	NS	NS	mg/kg	119,000	26,900	11,700	7,960
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.831 U	<1 U	<0.856 U	<0.893 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	10.4	17.4	16.8	13.4
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	10	17	17	13
Cobalt	7440-48-4	NS	NS	mg/kg	3.36	32.4	7.94	9.47
Copper	7440-50-8	**50**	270	mg/kg	49.5	**123**	**92.1**	**52.9**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	0.33 J
Iron	7439-89-6	NS	NS	mg/kg	10,500	20,700	17,000	22,000
Lead	7439-92-1	**63**	400	mg/kg	**108**	**252**	**250**	**872**
Magnesium	7439-95-4	NS	NS	mg/kg	48,900	10,700	6,000	2,360
Manganese	7439-96-5	1600	2000	mg/kg	289	172	201	232
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.231**	0.153 J	**0.613**	**0.492**
Nickel	7440-02-0	**30**	310	mg/kg	9.82	19.5	13.7	19
Potassium	7440-09-7	NS	NS	mg/kg	289	690	766	691
Selenium	7782-49-2	**3.9**	180	mg/kg	<1.6 U	2.38	0.677 J	1.21 J
Silver	7440-22-4	2	180	mg/kg	<0.801 U	<0.95 U	<0.816 U	<0.857 U
Sodium	7440-23-5	NS	NS	mg/kg	100 J	257 J	452	<171 U
Thallium	7440-28-0	NS	NS	mg/kg	0.425 J	<1.9 U	<1.63 U	<1.71 U
Vanadium	7440-62-2	NS	NS	mg/kg	28.3	22.1	22.1	19.6
Zinc	7440-66-6	**109**	10000	mg/kg	**142**	**629**	**209**	**528**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	96.3	79.6	93.5	89.6
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 UJ
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000243 U	<0.000279 U	<0.000254 U	<0.000245 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	0.000039 J	<0.000558 U	<0.000508 U	<0.00049 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.000189 J	<0.000279 U	<0.000254 U	<0.000245 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	0.000132 J	<0.000558 U	<0.000508 U	<0.00049 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000243 U	<0.000279 U	<0.000254 U	<0.000245 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000243 U	<0.000279 U	<0.000254 U	<0.000245 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000117 J	0.000065 J	0.000145 J	<0.00049 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000083 J	<0.000279 U	<0.000254 U	<0.000245 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	0.000856	<0.000279 U	<0.000254 U	<0.000245 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000076 J	<0.000279 U	<0.000254 U	0.000075 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	0.00014 J	<0.000558 U	<0.000508 U	<0.00049 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	0.0001 J	<0.000558 U	<0.000508 U	<0.00049 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	0.000278 J	<0.000558 U	<0.000508 U	<0.00049 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000485 U	<0.000558 U	<0.000508 U	<0.00049 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000932 J	<0.000279 U	<0.000254 U	0.000075 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP28	EP28	EP29	EP30
				Sample Name	EP28_2	EPDUP02_110321	EP29_2	EP30_2
				Sample Date	11/03/2021	11/03/2021	09/10/2021	10/08/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0036 U	<0.0076 U	<0.0051 U	<0.0045 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.097 U	<0.2 U	<0.14 U	<0.12 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.012 U	<0.025 U	<0.017 U	<0.015 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Acetone	67-64-1	**0.05**	100	mg/kg	**0.24**	**0.39**	<0.017 U	<0.015 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0048 U	<0.01 U	<0.0068 U	<0.006 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0048 U	<0.01 U	<0.0068 U	<0.006 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.012 U	<0.025 U	<0.017 U	<0.015 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0018 U	<0.0038 U	<0.0026 U	<0.0022 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0048 U	<0.01 U	<0.0068 U	<0.006 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.012 U	<0.025 U	<0.017 U	<0.015 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Ethylbenzene	100-41-4	1	41	mg/kg	0.00019 J	<0.0025 U	<0.0017 U	<0.0015 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0048 U	<0.01 U	<0.0068 U	<0.006 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	0.00083 J	0.0014 J	<0.0034 U	<0.003 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	0.019	<0.025 U	<0.017 U	<0.015 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.012 U	<0.025 U	<0.017 U	<0.015 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.006 U	<0.013 U	<0.0085 U	<0.0074 U
Naphthalene	91-20-3	12	100	mg/kg	0.0012 J	<0.01 U	<0.0068 U	<0.006 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0024 U	<0.005 U	<0.0034 U	<0.003 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
Toluene	108-88-3	0.7	100	mg/kg	0.0032	0.0048	0.00095 J	<0.0015 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	0.00083 J	0.0014 J	<0.0017 U	<0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0018 U	<0.0038 U	<0.0026 U	<0.0022 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.006 U	<0.013 U	<0.0085 U	<0.0074 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.0006 U	<0.0013 U	<0.00085 U	<0.00074 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0048 U	<0.01 U	<0.0068 U	<0.006 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.012 U	<0.025 U	<0.017 U	<0.015 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0012 U	<0.0025 U	<0.0017 U	<0.0015 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP28	EP28	EP29	EP30
				Sample Name	EP28_2	EPDUP02_110321	EP29_2	EP30_2
				Sample Date	11/03/2021	11/03/2021	09/10/2021	10/08/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.55 UJ	<0.55 UJ	<0.27 UJ	<0.028 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<2.2 U	<2.2 U	<1.1 U	<0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<3.3 U	<3.3 U	<1.6 U	<0.16 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<18 U	<18 U	<8.5 U	<0.88 UJ
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	1.8 J	5.6	0.75 J	0.57
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<8 U	<7.9 U	<3.8 U	<0.4 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<5.3 U	**0.86 J**	<2.6 U	0.1 J
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<9.6 U	<9.6 U	<4.6 U	<0.48 UJ
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<5.2 U	<5.1 U	<2.5 U	<0.26 U
Acenaphthene	83-32-9	20	100	mg/kg	3.2 J	12 J	1.9	1.9
Acenaphthylene	208-96-8	100	100	mg/kg	1.6 J	3.4	0.68 J	0.68
Acetophenone	98-86-2	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Anthracene	120-12-7	100	100	mg/kg	7.1 J	25 J	4.6	3.7
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**15 J**	**37 J**	**9.6**	**10**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**17 J**	**38 J**	**7.6**	**9.7**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**22 J**	**46 J**	**9.4**	**13**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	12 J	25 J	4.8	5.6
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**7.3 J**	**16 J**	**3.5**	**2.7**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<12 U	<12 U	<5.8 U	<0.59 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	1.9 J	3 J	<4 U	0.2 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<4 U	<4 U	<1.9 U	<0.2 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<3.3 U	<3.3 U	<1.6 U	<0.16 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<4.4 U	<4.4 U	<2.1 U	<0.22 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Carbazole	86-74-8	NS	NS	mg/kg	5.2 J	13 J	1.5 J	2.7
Chrysene	218-01-9	**1**	3.9	mg/kg	**18 J**	**38 J**	**8.9**	**10**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**3.1**	**5.9**	**1.1**	**1.5**
Dibenzofuran	132-64-9	**7**	59	mg/kg	3.8	**11**	1.6 J	1.8
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Fluoranthene	206-44-0	**100**	100	mg/kg	46 J	**110 J**	20	27
Fluorene	86-73-7	30	100	mg/kg	5.2 J	15 J	2.2	2.2
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<2.2 U	<2.2 U	<1.1 U	<0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<10 U	<10 U	<5.1 U	<0.52 UJ
Hexachloroethane	67-72-1	NS	NS	mg/kg	<2.9 U	<2.9 U	<1.4 U	<0.15 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**13 J**	**26 J**	**5.3**	**6.7**
Isophorone	78-59-1	NS	NS	mg/kg	<3.3 U	<3.3 U	<1.6 U	<0.16 U
Naphthalene	91-20-3	**12**	100	mg/kg	4.4 J	**14 J**	1.4 J	1.4
Nitrobenzene	98-95-3	NS	NS	mg/kg	<3.3 U	<3.3 U	<1.6 U	<0.16 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<3.7 U	<3.7 U	<1.8 U	<0.18 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	8.7	8.4	<1.4 U	<0.15 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<2.9 U	<2.9 U	<1.4 U	<0.15 U
Phenanthrene	85-01-8	**100**	100	mg/kg	41 J	**110 J**	19	23
Phenol	108-95-2	**0.33**	100	mg/kg	**0.91 J**	<3.7 U	<1.8 U	<0.18 U
Pyrene	129-00-0	100	100	mg/kg	36 J	89 J	18	22
Total SVOCs	SVOCs	NS	500	mg/kg	274.21	652.16	121.83	146.45

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP28	EP28	EP29	EP30
				Sample Name	EP28_2	EPDUP02_110321	EP29_2	EP30_2
				Sample Date	11/03/2021	11/03/2021	09/10/2021	10/08/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	<0.00325 U	<0.016 U	<0.00318 U	<0.00331 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000721 U	<0.00355 U	<0.000706 U	<0.000736 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00216 U	<0.0106 U	<0.00212 U	<0.00221 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0144 U	<0.071 U	<0.0141 U	<0.0147 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00108 U	<0.00532 U	<0.00106 U	<0.0011 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000721 U	<0.00355 U	<0.000706 U	<0.000736 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000721 U	<0.00355 U	<0.000706 U	<0.000736 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00216 U	<0.0106 U	<0.00212 U	<0.00221 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00173 U	<0.00852 U	<0.00169 U	<0.00177 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000721 U	<0.00355 U	<0.000706 U	<0.000736 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00216 U	<0.0106 U	<0.00212 U	<0.00221 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000866 U	<0.00426 U	<0.000847 U	<0.000883 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00325 U	<0.016 U	<0.00318 U	<0.00331 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00325 U	<0.016 U	<0.00318 U	<0.00331 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0325 U	<0.16 U	<0.0318 U	<0.0331 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.181 U	<0.187 U	<0.185 U	<0.185 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.181 U	<0.187 U	<0.185 U	<0.185 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.181 U	<0.187 U	<0.185 U	<0.185 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.035 U	<0.0376 U	<0.035 U	<0.0368 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.035 U	<0.0376 U	<0.035 U	<0.0368 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.035 U	<0.0376 U	<0.035 U	<0.0368 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.035 U	<0.0376 U	<0.035 U	<0.0368 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	0.0366	<0.0376 U	<0.035 U	<0.0368 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	0.0352	<0.0376 U	0.0182 J	<0.0368 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	<0.035 U	<0.0376 U	<0.035 U	<0.0368 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.035 U	<0.0376 U	<0.035 U	<0.0368 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.035 U	<0.0376 U	<0.035 U	<0.0368 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0718	<0.0376 U	0.0182 J	<0.0368 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	5,320	5,180	3,750	5,050
Antimony	7440-36-0	NS	NS	mg/kg	1.6 J	3.62 J	1.49 J	1.61 J
Arsenic	7440-38-2	**13**	16	mg/kg	8.4 J	**26.6 J**	9.52	11.3
Barium	7440-39-3	**350**	400	mg/kg	104	154	72.2	82.2
Beryllium	7440-41-7	**7.2**	72	mg/kg	<0.418 U	<0.438 U	0.287 J	0.302 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.987 J	**2.84 J**	<0.844 U	0.782 J
Calcium	7440-70-2	NS	NS	mg/kg	9,000 J	20,500 J	25,000	9,830
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.89 U	<0.905 U	<0.879 U	<0.907 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	12.5	18.5	12.2	44.5
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	12	18	12	**44**
Cobalt	7440-48-4	NS	NS	mg/kg	9.59 J	17 J	4.45	9.58
Copper	7440-50-8	**50**	270	mg/kg	**65 J**	**106**	**61.5**	**65.4**
Cyanide	57-12-5	27	27	mg/kg	<1 UJ	<1.1 UJ	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	22,200 J	53,300 J	15,800	16,900
Lead	7439-92-1	**63**	400	mg/kg	**380**	**442**	**302**	**156**
Magnesium	7439-95-4	NS	NS	mg/kg	2,280 J	3,780	12,400	5,900
Manganese	7439-96-5	1600	2000	mg/kg	269 J	460 J	157	298
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**1.16 J**	**0.426 J**	**0.513**	**0.551**
Nickel	7440-02-0	**30**	310	mg/kg	20	**33.2**	9.18	12.8
Potassium	7440-09-7	NS	NS	mg/kg	638	656	480	517
Selenium	7782-49-2	**3.9**	180	mg/kg	1.3 J	2.65	0.506 J	<1.78 U
Silver	7440-22-4	2	180	mg/kg	<0.836 U	<0.876 U	<0.844 U	<0.888 U
Sodium	7440-23-5	NS	NS	mg/kg	<167 U	186	<169 U	<178 U
Thallium	7440-28-0	NS	NS	mg/kg	0.284 J	<1.75 U	<1.69 U	<1.78 U
Vanadium	7440-62-2	NS	NS	mg/kg	20	25	15.1	21.1
Zinc	7440-66-6	**109**	10000	mg/kg	**191 J**	**361 J**	**171**	**154**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	89.9	88.4	91	88.2
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 UJ
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 UJ
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000259 U	<0.000269 U	<0.000258 U	<0.000261 UJ
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 UJ
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.000259 U	<0.000269 U	<0.000258 U	<0.000261 UJ
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 UJ
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000259 U	<0.000269 U	0.000076 J	<0.000261 UJ
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000259 U	<0.000269 U	<0.000258 U	<0.000261 UJ
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 UJ
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	<0.000259 U	<0.000269 U	<0.000258 U	<0.000261 UJ
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	<0.000259 U	<0.000269 U	<0.000258 U	<0.000261 UJ
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	<0.000259 U	<0.000269 U	<0.000258 U	0.000146 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 UJ
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.0022 UJ
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.0022 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 UJ
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000517 U	<0.000537 U	<0.000516 U	<0.000521 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	<0.000259 U	<0.000269 U	<0.000258 U	0.000146 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP31	EP32	EP33	EP34
				Sample Name	EP31_2	EP32_2	EP33_2	EP34_2
				Sample Date	08/19/2021	08/19/2021	08/17/2021	11/03/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0037 U	<0.0057 U	<0.0043 U	<0.0055 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.098 U	<0.15 U	<0.12 U	<0.15 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.012 U	<0.019 U	<0.014 U	<0.018 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.012 U	<0.019 U	<0.014 U	**0.068**
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0049 U	<0.0076 U	<0.0058 U	<0.0073 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0049 U	<0.0076 U	<0.0058 U	<0.0073 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.012 U	<0.019 U	<0.014 U	<0.018 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0018 U	<0.0029 U	<0.0022 U	<0.0027 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0049 U	<0.0076 U	<0.0058 U	<0.0073 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.012 U	<0.019 U	<0.014 U	<0.018 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0049 U	<0.0076 U	<0.0058 U	<0.0073 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.012 UJ	<0.019 UJ	<0.014 U	0.0049 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.012 U	<0.019 U	<0.014 U	<0.018 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0061 U	<0.0096 U	<0.0072 U	<0.0091 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0049 U	<0.0076 U	<0.0058 U	<0.0073 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0024 U	<0.0038 U	<0.0029 U	<0.0036 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0018 U	<0.0029 U	<0.0022 U	<0.0027 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0061 U	<0.0096 U	<0.0072 U	<0.0091 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00061 U	<0.00096 U	<0.00072 U	<0.00091 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0049 U	<0.0076 U	<0.0058 U	<0.0073 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.012 U	<0.019 U	<0.014 U	<0.018 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0012 U	<0.0019 U	<0.0014 U	<0.0018 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP31	EP32	EP33	EP34
				Sample Name	EP31_2	EP32_2	EP33_2	EP34_2
				Sample Date	08/19/2021	08/19/2021	08/17/2021	11/03/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.032 UJ	<0.027 UJ	<0.027 U	<0.27 UJ
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.13 U	<0.11 U	<0.11 U	<1.1 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.19 U	<0.16 U	<0.16 U	<1.6 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<1 U	<0.86 U	<0.86 U	<8.7 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.17 J	0.087 J	0.19 J	0.48 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.46 U	<0.39 U	<0.38 U	<3.9 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<0.31 U	<0.26 U	<0.26 U	<2.6 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.55 U	<0.46 U	<0.46 U	<4.7 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.3 U	<0.25 U	<0.25 U	<2.5 U
Acenaphthene	83-32-9	20	100	mg/kg	0.38	0.074 J	0.48	1.6
Acenaphthylene	208-96-8	100	100	mg/kg	0.09 J	0.057 J	0.24	0.75 J
Acetophenone	98-86-2	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Anthracene	120-12-7	100	100	mg/kg	0.78	0.21	1	4.2
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**3.2**	0.93	**2.5**	**9.5**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**2.9**	0.92	**2.4**	**9**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**3.3**	**1.2**	**3.2**	**11**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	1.7	0.62	1.6	6
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**0.97**	0.29	0.7	**3.3**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.69 U	<0.58 U	<0.58 U	<5.8 U
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<0.48 U	<0.41 U	0.085 J	<4.1 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.23 U	<0.19 U	<0.19 U	<2 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.19 U	<0.16 U	<0.16 U	<1.6 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.26 U	<0.21 U	<0.21 U	<2.2 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.15 J	<0.18 U	<0.18 U	<1.8 U
Carbazole	86-74-8	NS	NS	mg/kg	0.17 J	0.055 J	0.35	1.3 J
Chrysene	218-01-9	**1**	3.9	mg/kg	**3.3**	0.88	**2.2**	**9.3**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.4**	0.14	0.33	**1.5**
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.18 J	0.057 J	0.4	1.2 J
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Fluoranthene	206-44-0	**100**	100	mg/kg	5	1.6	5.7	22
Fluorene	86-73-7	30	100	mg/kg	0.28	0.073 J	0.5	1.6 J
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.13 U	<0.11 U	<0.11 U	<1.1 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.61 U	<0.51 U	<0.51 U	<5.2 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.17 U	<0.14 U	<0.14 U	<1.4 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**1.8**	**0.65**	**1.9**	**6.4**
Isophorone	78-59-1	NS	NS	mg/kg	<0.19 U	<0.16 U	<0.16 U	<1.6 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.27	0.1 J	0.3	0.96 J
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.19 U	<0.16 U	<0.16 U	<1.6 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.17 U	<0.14 U	<0.14 U	<1.4 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.17 U	<0.14 U	<0.14 U	<1.4 U
Phenanthrene	85-01-8	**100**	100	mg/kg	3.3	0.75	4	19
Phenol	108-95-2	**0.33**	100	mg/kg	<0.21 U	<0.18 U	<0.18 U	<1.8 U
Pyrene	129-00-0	100	100	mg/kg	6	1.6	5	18
Total SVOCs	SVOCs	NS	500	mg/kg	34.34	10.293	33.075	127.09

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP31	EP32	EP33	EP34
				Sample Name	EP31_2	EP32_2	EP33_2	EP34_2
				Sample Date	08/19/2021	08/19/2021	08/17/2021	11/03/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00203 U	0.00222	0.00104 J	<0.00169 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00203 U	<0.00172 U	<0.00167 U	<0.00169 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	<0.0038 U	**0.00456**	<0.00313 U	<0.00316 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00203 U	<0.00172 U	<0.00167 U	<0.00169 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000845 U	<0.000719 U	<0.000696 U	<0.000703 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00253 U	0.00244	<0.00209 U	<0.00211 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00203 U	<0.00172 U	<0.00167 U	<0.00169 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00203 U	<0.00172 U	<0.00167 U	<0.00169 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00203 U	<0.00172 U	<0.00167 U	<0.00169 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0169 U	<0.0144 U	<0.0139 U	<0.014 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00203 U	<0.00172 U	<0.00167 U	<0.00169 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00127 U	<0.00108 U	<0.00104 U	<0.00105 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000845 U	<0.000719 U	<0.000696 U	<0.000703 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000845 U	<0.000719 U	<0.000696 U	<0.000703 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00253 U	<0.00216 U	<0.00209 U	<0.00211 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00203 U	<0.00172 U	<0.00167 U	<0.00169 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000845 U	<0.000719 U	<0.000696 U	<0.000703 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00253 U	0.00206 J	<0.00209 U	<0.00211 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.00101 U	<0.000863 U	<0.000835 U	<0.000843 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.0038 U	<0.00323 U	<0.00313 U	<0.00316 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.0038 U	<0.00323 U	<0.00313 U	<0.00316 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.038 U	<0.0323 U	<0.0313 U	<0.0316 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.212 U	<0.177 U	<0.178 U	<0.179 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.212 U	<0.177 U	<0.178 U	<0.179 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.212 U	<0.177 U	<0.178 U	<0.179 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0416 U	<0.0356 U	<0.0359 U	<0.0367 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0416 U	<0.0356 U	<0.0359 U	<0.0367 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0416 U	<0.0356 U	<0.0359 U	<0.0367 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0416 U	<0.0356 U	<0.0359 U	<0.0367 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0416 U	<0.0356 U	<0.0359 U	<0.0367 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	0.0295 J	0.0231 J	0.042	<0.0367 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	<0.0416 U	0.0235 J	0.0402	<0.0367 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0416 U	<0.0356 U	<0.0359 U	<0.0367 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0416 U	<0.0356 U	<0.0359 U	<0.0367 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0295 J	0.0466 J	0.0822	<0.0367 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	4,080	5,140	5,240	5,220
Antimony	7440-36-0	NS	NS	mg/kg	4.5 J	0.914 J	0.465 J	2.16 J
Arsenic	7440-38-2	**13**	16	mg/kg	10.8	**20.3**	12.4	9.62
Barium	7440-39-3	**350**	400	mg/kg	100	93.8	98.7	79
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.407 J	0.379 J	0.343 J	<0.427 U
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.377 J	0.247 J	0.449 J	1.14
Calcium	7440-70-2	NS	NS	mg/kg	7,720	33,800	20,500	21,200
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<1.03 U	<0.875 U	<0.87 UJ	<0.881 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	16	14.8	23.7	94.8
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	16	15	24	**95**
Cobalt	7440-48-4	NS	NS	mg/kg	7.22	6.08	6.63	11.9
Copper	7440-50-8	**50**	270	mg/kg	**108**	**74.6**	**66**	**58.4**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	<1 UJ
Iron	7439-89-6	NS	NS	mg/kg	23,600	17,000	15,800	23,600
Lead	7439-92-1	**63**	400	mg/kg	**218**	**204**	**212**	**295**
Magnesium	7439-95-4	NS	NS	mg/kg	3,620	16,600	10,400	10,200
Manganese	7439-96-5	1600	2000	mg/kg	296	181	146	397
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.488**	**0.494**	**0.479**	**0.32**
Nickel	7440-02-0	**30**	310	mg/kg	15.3	12.7	14.5	23.3
Potassium	7440-09-7	NS	NS	mg/kg	752	760	639	678
Selenium	7782-49-2	**3.9**	180	mg/kg	0.665 J	0.692 J	0.751 J	1.27 J
Silver	7440-22-4	2	180	mg/kg	<0.992 U	<0.823 U	<0.816 U	<0.854 U
Sodium	7440-23-5	NS	NS	mg/kg	81.5 J	375	<163 U	<171 U
Thallium	7440-28-0	NS	NS	mg/kg	<1.98 U	<1.65 U	<1.63 U	<1.71 U
Vanadium	7440-62-2	NS	NS	mg/kg	17.4	18.9	18	18.3
Zinc	7440-66-6	**109**	10000	mg/kg	**217**	**158**	**228**	**154**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	77.3	91.4	92	90.8
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 UJ
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 UJ
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000291 U	<0.000259 U	<0.000254 U	<0.000259 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.000291 U	<0.000259 U	<0.000254 U	<0.000259 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000291 U	<0.000259 U	<0.000254 U	<0.000259 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000291 U	<0.000259 U	<0.000254 U	<0.000259 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000583 U	<0.000517 U	0.000182 J	<0.000518 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	<0.000291 U	<0.000259 U	<0.000254 U	<0.000259 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000583 UJ	<0.000517 UJ	<0.000508 U	<0.000518 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	<0.000291 U	<0.000259 U	<0.000254 U	<0.000259 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	<0.000291 U	0.000138 J	0.000118 J	0.000065 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000583 U	<0.000517 U	<0.000508 U	<0.000518 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	<0.000291 U	0.000138 J	0.000118 J	0.000065 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP35	EP36	EP37	EP38
				Sample Name	EP35_5	EP36_2	EP37_2	EP38_9
				Sample Date	09/10/2021	10/08/2021	08/19/2021	09/23/2021
				Sample Depth	5	2	2	4
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.003 U	<0.0023 U	0.0036 J	<0.0034 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0046 U	<0.0035 U	<0.0034 U	<0.0051 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.003 U	<0.0023 U	0.00046 J	<0.0034 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.12 U	<0.093 U	<0.091 U	<0.14 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.015 U	<0.012 U	<0.011 U	<0.017 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.015 U	<0.012 U	0.017	0.037
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0061 U	<0.0046 U	<0.0045 U	<0.0068 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0061 U	<0.0046 U	<0.0045 U	<0.0068 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.015 U	<0.012 U	<0.011 U	<0.017 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00076 U	<0.00058 U	0.00043 J	<0.00085 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0023 U	<0.0017 U	<0.0017 U	<0.0026 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0061 U	<0.0046 U	<0.0045 U	<0.0068 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.015 U	<0.012 U	<0.011 U	<0.017 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0061 U	<0.0046 U	<0.0045 U	<0.0068 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.015 U	<0.012 U	<0.011 UJ	0.015 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.015 U	<0.012 U	<0.011 U	<0.017 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0076 U	<0.0058 U	<0.0057 U	<0.0085 U
Naphthalene	91-20-3	12	100	mg/kg	0.0012 J	<0.0046 U	<0.0045 U	<0.0068 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.003 U	<0.0023 U	<0.0023 U	<0.0034 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0023 U	<0.0017 U	<0.0017 U	<0.0026 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0076 U	<0.0058 U	<0.0057 U	<0.0085 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00076 U	<0.00058 U	<0.00057 U	<0.00085 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0061 U	<0.0046 U	<0.0045 U	<0.0068 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.015 U	<0.012 U	<0.011 U	<0.017 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0015 U	<0.0012 U	<0.0011 U	<0.0017 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP35	EP36	EP37	EP38
				Sample Name	EP35_5	EP36_2	EP37_2	EP38_9
				Sample Date	09/10/2021	10/08/2021	08/19/2021	09/23/2021
				Sample Depth	5	2	2	4
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.28 UJ	<0.027 U	<0.03 UJ	<0.034 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<1.1 U	<0.11 U	<0.12 U	<0.14 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<1.7 U	<0.16 U	<0.18 U	<0.2 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	0.098 J
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<9 U	<0.87 UJ	<0.97 U	<1.1 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.76 J	<0.22 U	<0.24 U	0.94
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<1.9 U	<0.18 U	<0.2 U	0.086 J
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<4 U	<0.39 U	<0.44 U	<0.49 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<2.7 U	<0.26 U	<0.29 U	**0.42**
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<4.9 U	<0.47 UJ	<0.53 U	<0.59 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<2.6 U	<0.25 U	<0.28 U	<0.32 U
Acenaphthene	83-32-9	20	100	mg/kg	2	<0.14 U	0.069 J	4.9
Acenaphthylene	208-96-8	100	100	mg/kg	1 J	<0.14 U	0.048 J	0.57
Acetophenone	98-86-2	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Anthracene	120-12-7	100	100	mg/kg	4.6	<0.11 U	0.17	6.3
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**10**	0.027 J	0.64	**23**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**8.7**	<0.14 U	0.66	**19**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**11**	<0.11 U	0.79	**24**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	5.6	0.12 J	0.43	9
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**3.6**	<0.11 U	0.3	**2.6**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<6.1 U	<0.59 UJ	<0.66 U	0.37 J
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<4.3 U	<0.41 U	<0.46 U	0.35 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<2 U	<0.2 U	<0.22 U	<0.25 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<1.7 U	<0.16 U	<0.18 U	<0.2 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<2.2 U	<0.22 U	<0.24 U	<0.27 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Carbazole	86-74-8	NS	NS	mg/kg	1.7 J	<0.18 U	0.055 J	2.8
Chrysene	218-01-9	**1**	3.9	mg/kg	**10**	0.019 J	0.65	**23**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**1.2**	<0.11 U	0.086 J	**2**
Dibenzofuran	132-64-9	**7**	59	mg/kg	1.7 J	<0.18 U	0.032 J	2.5
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Fluoranthene	206-44-0	**100**	100	mg/kg	22	0.034 J	1.5	42
Fluorene	86-73-7	30	100	mg/kg	2.1	<0.18 U	0.062 J	4.2
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<1.1 U	<0.11 U	<0.12 U	<0.14 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<5.4 U	<0.52 UJ	<0.58 U	<0.65 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<1.5 U	<0.14 U	<0.16 U	<0.18 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**6.2**	0.048 J	0.48	**12**
Isophorone	78-59-1	NS	NS	mg/kg	<1.7 U	<0.16 U	<0.18 U	<0.2 U
Naphthalene	91-20-3	**12**	100	mg/kg	1.8 J	<0.18 U	<0.2 U	2
Nitrobenzene	98-95-3	NS	NS	mg/kg	<1.7 U	<0.16 U	<0.18 U	<0.2 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<1.9 U	<0.18 U	<0.2 U	<0.23 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<1.5 U	<0.14 U	<0.16 U	<0.18 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<1.5 U	<0.14 U	<0.16 U	<0.18 U
Phenanthrene	85-01-8	**100**	100	mg/kg	20	0.022 J	0.83	36
Phenol	108-95-2	**0.33**	100	mg/kg	<1.9 U	<0.18 U	<0.2 U	0.18 J
Pyrene	129-00-0	100	100	mg/kg	20	0.031 J	1.4	39
Total SVOCs	SVOCs	NS	500	mg/kg	133.96	0.301	8.202	257.314

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP35	EP36	EP37	EP38
				Sample Name	EP35_5	EP36_2	EP37_2	EP38_9
				Sample Date	09/10/2021	10/08/2021	08/19/2021	09/23/2021
				Sample Depth	5	2	2	4
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	<0.00333 U	<0.00321 U	<0.00356 U	<0.00412 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000739 U	<0.000713 U	<0.000791 U	<0.000915 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00222 U	<0.00214 U	<0.00237 U	<0.00274 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0148 U	<0.0143 U	<0.0158 U	<0.0183 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00111 U	<0.00107 U	<0.00119 U	<0.00137 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000739 U	<0.000713 U	<0.000791 U	<0.000915 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000739 U	<0.000713 U	<0.000791 U	<0.000915 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00222 U	<0.00214 U	<0.00237 U	<0.00274 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00177 U	<0.00171 U	<0.0019 U	<0.0022 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000739 U	<0.000713 U	<0.000791 U	<0.000915 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00222 U	<0.00214 U	<0.00237 U	<0.00274 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000887 U	<0.000856 U	<0.000949 U	<0.0011 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00333 U	<0.00321 U	<0.00356 U	<0.00412 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00333 U	<0.00321 U	<0.00356 U	<0.00412 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0333 U	<0.0321 U	<0.0356 U	<0.0412 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.192 U	<0.182 U	<0.206 U	<0.227 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.192 U	<0.182 U	<0.206 U	<0.227 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.192 U	<0.182 U	<0.206 U	<0.227 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0371 U	<0.0355 U	0.0135 J	<0.0462 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0371 U	<0.0355 U	<0.0402 U	<0.0462 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	<0.0371 U	<0.0355 U	0.0135 J	<0.0462 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	5,230	3,010	7,750	3,470
Antimony	7440-36-0	NS	NS	mg/kg	1.64 J	<4.39 U	0.627 J	1 J
Arsenic	7440-38-2	**13**	16	mg/kg	12.2	3.78	10.6	4.76
Barium	7440-39-3	**350**	400	mg/kg	59.3	77.4	82.8	90.6
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.316 J	0.184 J	0.768	0.237 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	<0.902 U	0.369 J	0.712 J	0.518 J
Calcium	7440-70-2	NS	NS	mg/kg	13,600	2,460	14,500	4,250
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.923 U	<0.886 U	<0.996 U	<1.12 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	10.5	9.98	18.1	10.6
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	10	10	18	11
Cobalt	7440-48-4	NS	NS	mg/kg	9.02	12.9	10.7	7.56
Copper	7440-50-8	**50**	270	mg/kg	**97.8**	46	**70.4**	**118**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	23,400	10,600	14,900	17,900
Lead	7439-92-1	**63**	400	mg/kg	**217**	46.2	**162**	**381**
Magnesium	7439-95-4	NS	NS	mg/kg	5,480	2,330	7,820	1,720
Manganese	7439-96-5	1600	2000	mg/kg	273	679	109	172
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.219**	<0.072 U	**0.434**	**4.59**
Nickel	7440-02-0	**30**	310	mg/kg	14.3	**49.8**	25.8	17.7
Potassium	7440-09-7	NS	NS	mg/kg	602	466	757	592
Selenium	7782-49-2	**3.9**	180	mg/kg	0.605 J	<1.76 U	0.871 J	**8.47**
Silver	7440-22-4	2	180	mg/kg	<0.902 U	<0.878 U	<0.936 U	<1.08 U
Sodium	7440-23-5	NS	NS	mg/kg	<180 U	<176 U	76.3 J	<216 U
Thallium	7440-28-0	NS	NS	mg/kg	<1.8 U	<1.76 U	<1.87 U	<2.16 U
Vanadium	7440-62-2	NS	NS	mg/kg	16.9	11.2	21.4	9.78
Zinc	7440-66-6	**109**	10000	mg/kg	**134**	31.2	**260**	**275**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	86.7	90.3	80.3	71.6
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000521 U	<0.000491 UJ	<0.000576 U	<0.000654 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000521 U	<0.000491 UJ	<0.000576 U	<0.000654 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.00026 U	<0.000246 U	<0.000288 U	<0.000327 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000521 U	<0.000491 UJ	<0.000576 U	<0.000654 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.00026 U	0.000078 J	<0.000288 U	<0.000327 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000521 U	0.00009 J	<0.000576 U	<0.000654 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.00026 U	<0.000246 UJ	<0.000288 U	<0.000327 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.00026 U	<0.000246 U	<0.000288 U	<0.000327 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000521 U	0.000064 J	<0.000576 U	<0.000654 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000476	<0.000246 UJ	<0.000288 U	<0.000327 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	0.000141 J	0.000427 J	<0.000288 U	<0.000327 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000097 J	0.000065 J	<0.000288 U	0.000142 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000521 U	0.000132 J	<0.000576 U	<0.000654 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000521 U	<0.000491 U	<0.000576 U	<0.000654 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000238 J	0.000492 J	<0.000288 U	0.000142 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP39	EP39	EP40	EP41
				Sample Name	EP39_2	EPDUP03_120221	EP40_5	EP41_9
				Sample Date	12/02/2021	12/02/2021	09/23/2021	09/16/2021
				Sample Depth	2	2	5	9
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0052 UJ	<0.004 U	<0.0038 U	<0.005 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.14 UJ	<0.11 U	<0.1 U	<0.13 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.017 UJ	<0.014 U	<0.013 U	<0.017 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Acetone	67-64-1	**0.05**	100	mg/kg	**0.062 J**	<0.014 UJ	<0.013 U	<0.017 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.007 UJ	<0.0054 U	<0.0051 U	<0.0066 UJ
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.007 UJ	<0.0054 U	<0.0051 U	<0.0066 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.017 UJ	<0.014 U	<0.013 U	<0.017 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0026 U	<0.002 U	<0.0019 U	<0.0025 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.007 UJ	<0.0054 U	<0.0051 U	<0.0066 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
Cymene	99-87-6	NS	NS	mg/kg	0.0003 J	<0.0014 U	<0.0013 U	<0.0017 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.017 UJ	<0.014 U	<0.013 U	<0.017 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Ethylbenzene	100-41-4	1	41	mg/kg	0.00032 J	<0.0014 U	<0.0013 U	<0.0017 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.007 UJ	<0.0054 U	<0.0051 U	<0.0066 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.015 U	<0.014 U	<0.013 U	<0.017 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.017 UJ	<0.014 U	<0.013 U	<0.017 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0087 UJ	<0.0068 U	<0.0063 U	<0.0083 U
Naphthalene	91-20-3	12	100	mg/kg	0.0071 J	<0.0054 U	<0.0051 U	<0.0066 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0035 UJ	<0.0027 U	<0.0025 U	<0.0033 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0026 UJ	<0.002 U	<0.0019 U	<0.0025 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0087 UJ	<0.0068 U	<0.0063 U	<0.0083 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00087 UJ	<0.00068 U	<0.00063 U	<0.00083 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.007 UJ	<0.0054 U	<0.0051 U	<0.0066 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.017 UJ	<0.014 U	<0.013 U	<0.017 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0017 UJ	<0.0014 U	<0.0013 U	<0.0017 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP39	EP39	EP40	EP41
				Sample Name	EP39_2	EPDUP03_120221	EP40_5	EP41_9
				Sample Date	12/02/2021	12/02/2021	09/23/2021	09/16/2021
				Sample Depth	2	2	5	9
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.028 U	<0.03 U	<0.026 U	<0.028 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.12 U	<0.11 U	<0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.17 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.88 U	<0.97 U	<0.85 U	<0.9 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.15 J	<0.24 U	0.16 J	0.34
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.2 U	<0.18 U	0.034 J
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.4 U	<0.44 U	<0.38 U	<0.4 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<0.26 U	<0.29 U	0.037 J	0.099 J
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.48 U	<0.53 U	<0.46 U	<0.49 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.26 U	<0.28 U	<0.25 U	<0.26 U
Acenaphthene	83-32-9	20	100	mg/kg	0.49 J	0.043 J	0.65	0.79
Acenaphthylene	208-96-8	100	100	mg/kg	0.14 J	0.074 J	0.22	0.37
Acetophenone	98-86-2	NS	NS	mg/kg	0.033 J	<0.2 U	<0.18 U	<0.19 U
Anthracene	120-12-7	100	100	mg/kg	1.1 J	0.14 J	1.3	2.2
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**3 J**	0.46 J	**3.8**	**4.7**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**2.5 J**	0.47 J	**3.4**	**5.4**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**3.3 J**	0.45 J	**4.4**	**5.1**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	1.7 J	0.35 J	2.1	2.6
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**1 J**	0.19 J	**1.2**	**1.8**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.6 UJ	<0.66 UJ	<0.57 U	<0.61 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 U	0.15 J	<0.18 U	<0.19 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<0.42 U	<0.46 U	0.051 J	0.089 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.22 U	<0.19 U	<0.2 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.17 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.24 U	<0.21 U	<0.22 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	<0.18 UJ	0.95 J	<0.18 U	<0.19 U
Carbazole	86-74-8	NS	NS	mg/kg	0.43	0.067 J	0.43	0.84
Chrysene	218-01-9	**1**	3.9	mg/kg	**3.1 J**	0.47 J	**3.5**	**4.5**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.46 J**	0.072 J	**0.51**	**0.61**
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.27	0.031 J	0.44	0.59
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
Fluoranthene	206-44-0	**100**	100	mg/kg	5.1 J	1 J	6	7
Fluorene	86-73-7	30	100	mg/kg	0.47 J	0.044 J	0.63	0.62
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.12 U	<0.11 U	<0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.53 U	<0.58 U	<0.5 U	<0.54 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.15 U	<0.16 U	<0.14 U	<0.15 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**1.8 J**	0.36 J	**2.4**	**3**
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.17 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.27	0.039 J	0.28	0.7
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.18 U	<0.16 U	<0.17 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.2 U	<0.18 U	<0.19 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.15 U	<0.16 U	<0.14 U	<0.15 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.15 U	<0.16 U	<0.14 U	<0.15 U
Phenanthrene	85-01-8	**100**	100	mg/kg	5.1 J	0.57 J	4.9	11
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	<0.2 U	<0.18 U	0.062 J
Pyrene	129-00-0	100	100	mg/kg	5.4 J	0.89 J	5.7	6.2
Total SVOCs	SVOCs	NS	500	mg/kg	35.813	6.82	42.108	58.644

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP39	EP39	EP40	EP41
				Sample Name	EP39_2	EPDUP03_120221	EP40_5	EP41_9
				Sample Date	12/02/2021	12/02/2021	09/23/2021	09/16/2021
				Sample Depth	2	2	5	9
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00173 U	**0.00392**	<0.0016 U	<0.00183 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00173 UJ	**0.0144 J**	<0.0016 U	<0.00183 U
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	<0.00324 UJ	**0.0127 J**	<0.003 U	<0.00342 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00173 U	<0.00192 U	<0.0016 U	<0.00183 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000721 U	<0.000802 U	<0.000666 U	<0.000761 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00216 UJ	0.0103 J	<0.002 U	<0.00228 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00173 U	<0.00192 U	<0.0016 U	<0.00183 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00173 UJ	<0.00192 UJ	<0.0016 U	<0.00183 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00173 U	<0.00192 U	<0.0016 U	<0.00183 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0144 UJ	0.0857 J	<0.0133 U	<0.0152 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00173 U	<0.00192 U	<0.0016 U	<0.00183 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00108 UJ	**0.00513 J**	<0.000998 U	<0.00114 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000721 U	<0.000802 U	<0.000666 U	<0.000761 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000721 U	<0.000802 U	<0.000666 U	<0.000761 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00216 U	<0.00241 U	<0.002 U	<0.00228 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00173 U	<0.00192 U	<0.0016 U	<0.00183 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000721 U	<0.000802 U	<0.000666 U	<0.000761 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00216 UJ	0.0126 J	<0.002 U	<0.00228 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000865 U	<0.000962 U	<0.000799 U	<0.000914 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00324 U	<0.00361 U	<0.003 U	<0.00342 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00324 U	<0.00361 U	<0.003 U	<0.00342 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0324 U	<0.0361 U	<0.03 U	<0.0342 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.187 U	<0.201 U	<0.173 U	<0.186 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.187 U	<0.201 U	<0.173 U	<0.186 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.187 U	<0.201 U	<0.173 U	<0.186 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	<0.036 U	0.0171 J	<0.0338 U	<0.0379 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.036 U	<0.0388 U	<0.0338 U	<0.0379 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	<0.036 U	0.0171 J	<0.0338 U	<0.0379 U
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	4,560	4,920	6,160	5,570
Antimony	7440-36-0	NS	NS	mg/kg	0.448 J	<4.74 U	0.42 J	0.965 J
Arsenic	7440-38-2	**13**	16	mg/kg	**24.5 J**	**13.4 J**	6.91	12.2
Barium	7440-39-3	**350**	400	mg/kg	**360 J**	104 J	58.7	118
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.343 J	0.294 J	0.331 J	0.461
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	1.09	0.824 J	<0.808 U	0.278 J
Calcium	7440-70-2	NS	NS	mg/kg	21,200	13,300	14,200	11,400
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	0.593 J	<0.98 U	<0.851 U	<0.923 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	23	12.9	11.9	14.9
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	22 J	13 J	12	15
Cobalt	7440-48-4	NS	NS	mg/kg	6.59	4.76	6.91	8.2
Copper	7440-50-8	**50**	270	mg/kg	**97**	38.2	41.7	**86.9 J**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	19,100	15,100	16,000	20,100
Lead	7439-92-1	**63**	400	mg/kg	**547 J**	**150 J**	**500**	**512 J**
Magnesium	7439-95-4	NS	NS	mg/kg	3,960	6,060	4,860	5,090 J
Manganese	7439-96-5	1600	2000	mg/kg	432 J	221 J	324	256 J
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.95 J**	**0.267 J**	**0.216**	**1.08**
Nickel	7440-02-0	**30**	310	mg/kg	12.5	8.48	13.2	15
Potassium	7440-09-7	NS	NS	mg/kg	806	806	726	683
Selenium	7782-49-2	**3.9**	180	mg/kg	<1.76 U	**102**	0.21 J	1.27 J
Silver	7440-22-4	2	180	mg/kg	<0.879 U	<0.948 U	<0.808 U	<0.869 U
Sodium	7440-23-5	NS	NS	mg/kg	220	<190 U	230	179
Thallium	7440-28-0	NS	NS	mg/kg	<1.76 U	<1.9 U	<1.62 U	<1.74 UJ
Vanadium	7440-62-2	NS	NS	mg/kg	19.5	22.9	12.9	21.2
Zinc	7440-66-6	**109**	10000	mg/kg	**358 J**	**204 J**	99	**276 J**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	87.7	81.6	94	86.7
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000528 U	<0.000537 U	<0.000496 U	<0.000557 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000528 U	<0.000537 U	<0.000496 U	<0.000557 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000264 U	<0.000269 U	<0.000248 U	<0.000278 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000528 U	0.000033 J	0.000041 J	0.000052 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000528 U	<0.000537 U	<0.000496 U	<0.000557 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.000264 U	0.000407	<0.000248 U	0.0001 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000528 U	0.000402 J	<0.000496 U	<0.000557 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000528 U	<0.000537 U	<0.000496 U	<0.000557 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000264 U	<0.000269 U	<0.000248 U	0.000063 J
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	0.00144 J	<0.000269 UJ	<0.000248 U	<0.000278 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	<0.000528 U	<0.000537 U	0.000068 J	0.000109 J
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	<0.000264 U	0.000177 J	<0.000248 U	0.00023 J
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000528 U	<0.000537 U	<0.000496 U	<0.000557 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	0.000202 J	**0.00113 J**	<0.000248 U	**0.00194**
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000483	0.000239 J	0.000208 J	0.000628
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000528 U	<0.000537 U	0.000094 J	0.000143 J
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000528 U	0.000257 J	<0.000496 U	<0.000557 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000528 U	0.000338 J	<0.000496 U	<0.000557 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000528 U	0.000503 J	<0.000496 U	0.000171 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000528 U	<0.000537 U	<0.000496 U	<0.000557 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000528 U	<0.000537 U	<0.000496 U	<0.000557 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000685 J	0.00137 J	0.000208 J	0.00257

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP42	EP43	EP44	EP45
				Sample Name	EP42_2	EP43_2	EP44_2	EP45_2
				Sample Date	10/08/2021	10/25/2021	10/25/2021	12/02/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	0.0026
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	0.009
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0032 U	<0.0045 U	<0.0034 U	<0.0036 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	0.0032
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	0.0071
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.085 U	<0.12 U	<0.09 U	<0.096 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.011 U	<0.012 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.011 U	0.013 J	<0.011 U	**0.29**
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0042 U	<0.006 U	<0.0045 U	<0.0048 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0042 U	<0.006 U	<0.0045 U	<0.0048 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.011 U	<0.012 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0016 U	<0.0022 U	<0.0017 U	0.0029
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0042 U	<0.006 U	<0.0045 U	<0.0048 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0011 U	<0.0015 U	0.001 J	0.00084 J
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.011 U	<0.012 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0011 U	0.00055 J	<0.0011 U	0.00079 J
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0042 U	<0.006 U	<0.0045 U	<0.0048 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	0.0006 J
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	0.0027
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.011 U	<0.015 U	<0.011 U	<0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.011 U	<0.012 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0053 U	<0.0075 U	<0.0056 U	<0.006 U
Naphthalene	91-20-3	12	100	mg/kg	0.00092 J	<0.006 U	<0.0045 U	0.0021 J
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	0.0017
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	0.001 J
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	0.0019
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	0.001 J
Styrene	100-42-5	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0021 U	<0.003 U	<0.0022 U	<0.0024 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	0.00099 J
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	0.0046
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0016 U	<0.0022 U	<0.0017 U	<0.0018 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0053 U	<0.0075 U	<0.0056 U	<0.006 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00053 U	<0.00075 U	<0.00056 U	<0.0006 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0042 U	<0.006 U	<0.0045 U	<0.0048 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.011 U	<0.015 U	<0.011 U	<0.012 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0011 U	<0.0015 U	<0.0011 U	<0.0012 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	**Location**	EP42	EP43	EP44	EP45
				Sample Name	EP42_2	EP43_2	EP44_2	EP45_2
				Sample Date	10/08/2021	10/25/2021	10/25/2021	12/02/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.028 U	<0.027 U	<0.55 U	<0.036 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 UJ
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.11 U	<2.2 U	<0.14 UJ
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.17 U	<0.16 U	<3.3 U	<0.21 UJ
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 UJ
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.89 UJ	<0.86 U	<18 U	<1.1 UJ
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 UJ
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.58	0.18 J	4.1 J	0.14 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	0.049 J	<0.18 U	<3.6 U	<0.24 UJ
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.4 U	<0.39 U	<7.9 U	<0.51 UJ
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	0.045 J	0.031 J	<5.2 U	0.077 J
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.48 UJ	<0.47 U	<9.5 U	<0.62 UJ
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 UJ
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.26 U	<0.25 U	<5.1 U	<0.33 UJ
Acenaphthene	83-32-9	20	100	mg/kg	3.3	0.58	6.2	0.32
Acenaphthylene	208-96-8	100	100	mg/kg	0.31	0.3	9.6	0.15 J
Acetophenone	98-86-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Anthracene	120-12-7	100	100	mg/kg	5.8	1.4	25	0.91
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**9.7**	**4**	**41**	**2.1**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**8.6**	**4.3**	**39**	**1.8**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**10**	**5.6**	**51**	**2.4**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	4.3	2.8	22	1.2
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**2.5**	**1.4**	**13**	0.73
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.6 UJ	<0.58 U	<12 U	<0.77 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	0.2 J	0.061 J	1.4 J	<0.54 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.19 U	<3.9 U	<0.26 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.17 U	<0.16 U	<3.3 U	<0.21 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.22 U	<4.4 U	<0.28 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.083 J	<0.18 U	<3.6 U	<0.24 U
Carbazole	86-74-8	NS	NS	mg/kg	2	0.65	8.3	0.43
Chrysene	218-01-9	**1**	3.9	mg/kg	**8.6**	**4**	**37**	**2.1**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**1.1**	**0.53**	**6**	0.29
Dibenzofuran	132-64-9	**7**	59	mg/kg	1.9	0.38	**9.7**	0.28
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Fluoranthene	206-44-0	**100**	100	mg/kg	25	13	100	4.3
Fluorene	86-73-7	30	100	mg/kg	3	0.5	15	0.33
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.11 U	<2.2 U	<0.14 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.53 UJ	<0.51 U	<10 U	<0.68 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.15 U	<0.14 U	<2.9 U	<0.19 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**5.3**	**2.7**	**24**	**1.3**
Isophorone	78-59-1	NS	NS	mg/kg	<0.17 U	<0.16 U	<3.3 U	<0.21 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.98	0.39	4.8	0.39
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.17 U	<0.16 U	<3.3 U	<0.21 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<3.6 U	<0.24 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.15 U	<0.14 U	<2.9 U	<0.19 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.15 U	<0.14 U	<2.9 U	<0.19 U
Phenanthrene	85-01-8	**100**	100	mg/kg	24	6.1	100	4
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	<0.18 U	<3.6 U	0.054 J
Pyrene	129-00-0	100	100	mg/kg	21	12	81	3.8
Total SVOCs	SVOCs	NS	500	mg/kg	138.347	60.902	598.1	27.101

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP42	EP43	EP44	EP45
				Sample Name	EP42_2	EP43_2	EP44_2	EP45_2
				Sample Date	10/08/2021	10/25/2021	10/25/2021	12/02/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	<0.00223 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	0.00288
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	<0.00328 U	<0.00315 U	<0.00325 U	<0.00418 U
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	<0.00223 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000729 U	<0.0007 U	<0.000722 U	<0.000928 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00219 U	<0.0021 U	<0.00216 U	<0.00278 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	<0.00223 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	<0.00223 UJ
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	<0.00223 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0146 U	<0.014 U	<0.0144 U	<0.0186 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	<0.00223 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00109 U	<0.00105 U	<0.00108 U	<0.00139 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000729 U	<0.0007 U	<0.000722 U	<0.000928 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000729 U	<0.0007 U	<0.000722 U	<0.000928 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00219 U	<0.0021 U	<0.00216 U	<0.00278 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00175 U	<0.00168 U	<0.00173 U	<0.00223 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000729 U	<0.0007 U	<0.000722 U	<0.000928 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00219 U	<0.0021 U	<0.00216 U	<0.00278 U
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000875 U	<0.00084 U	<0.000866 U	<0.00111 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00328 U	<0.00315 U	<0.00325 U	<0.00418 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00328 U	<0.00315 U	<0.00325 U	<0.00418 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0328 U	<0.0315 U	<0.0325 U	<0.0418 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.185 U	<0.18 U	<0.179 U	<0.237 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.185 U	<0.18 U	<0.179 U	<0.237 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.185 U	<0.18 U	<0.179 U	<0.237 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	<0.0367 U	<0.0344 U	0.0168 J	0.0204 J
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0367 U	<0.0344 U	<0.0357 U	<0.046 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	<0.0367 U	<0.0344 U	0.0168 J	0.0204 J
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	4,660	4,180	4,220	6,750
Antimony	7440-36-0	NS	NS	mg/kg	2.95 J	0.914 J	0.431 J	<5.7 UJ
Arsenic	7440-38-2	**13**	16	mg/kg	**19.3**	11.6	11.7	**13.7**
Barium	7440-39-3	**350**	400	mg/kg	94.1	317	241	**440 J**
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.191 J	0.282 J	0.388 J	0.445 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	1.08	0.789 J	2.47	1.08 J
Calcium	7440-70-2	NS	NS	mg/kg	29,300	12,200	18,200	32,900
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.912 U	<0.868 U	<0.877 U	<1.17 UJ
Chromium, Total	7440-47-3	NS	NS	mg/kg	17	11.8	17.7	19.4 J
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	17	12	18	19
Cobalt	7440-48-4	NS	NS	mg/kg	7.31	5.23	9.34	7.22
Copper	7440-50-8	**50**	270	mg/kg	**75**	44.2	**87.2**	**82.4 J**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	26,000	24,400	10,700	21,400
Lead	7439-92-1	**63**	400	mg/kg	**314**	**206**	**816**	**604**
Magnesium	7439-95-4	NS	NS	mg/kg	15,400	3,240	4,180	3,970
Manganese	7439-96-5	1600	2000	mg/kg	237	300	321	374
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.438**	**0.829**	<0.085 U	**3.63**
Nickel	7440-02-0	**30**	310	mg/kg	13.3	11.2	16.2	13.7 J
Potassium	7440-09-7	NS	NS	mg/kg	888	589	433	1,060
Selenium	7782-49-2	**3.9**	180	mg/kg	<1.82 U	0.698 J	0.845 J	<2.28 U
Silver	7440-22-4	2	180	mg/kg	<0.908 U	<0.83 U	<0.862 U	<1.14 U
Sodium	7440-23-5	NS	NS	mg/kg	<182 U	227	360	294
Thallium	7440-28-0	NS	NS	mg/kg	<1.82 U	<1.66 U	<1.72 U	<2.28 U
Vanadium	7440-62-2	NS	NS	mg/kg	23	21.3	12.8	27.8
Zinc	7440-66-6	**109**	10000	mg/kg	**178**	**215**	**1,500**	**467**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	87.7	92.2	91.2	68.6
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.00217 UJ	<0.000495 U	<0.00049 U	<0.000655 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.00217 UJ	<0.000495 U	<0.00049 U	<0.000655 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000271 UJ	<0.000248 U	<0.000245 U	<0.000328 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	<0.000543 UJ	0.00003 J	0.000055 J	0.00005 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000543 U	<0.000495 U	<0.00049 U	<0.000655 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	<0.000271 UJ	0.0001 J	<0.000245 U	0.000135 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000543 UJ	<0.000495 U	<0.00049 U	<0.000655 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000543 U	<0.000495 U	<0.00049 U	<0.000655 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.000271 UJ	<0.000248 U	<0.000245 U	<0.000328 UJ
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000271 UJ	<0.000248 U	<0.000245 U	<0.000328 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000078 J	0.000053 J	0.000058 J	<0.000655 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000097 J	0.000182 J	<0.000245 U	0.000158 J
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000543 U	<0.000495 U	<0.00049 U	<0.000655 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	0.000451 J	**0.00157**	0.000405	**0.00233 J**
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000269 J	0.000241 J	0.000241 J	0.000482 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	<0.000543 U	<0.000495 U	<0.00049 U	<0.000655 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.00217 UJ	<0.000495 U	<0.00049 U	0.000083 J
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.00217 U	<0.000495 U	<0.00049 U	<0.000655 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	<0.000543 UJ	<0.000495 U	<0.00049 U	0.000069 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000543 U	<0.000495 U	<0.00049 U	<0.000655 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000543 U	<0.000495 U	<0.00049 U	<0.000655 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.00072 J	0.00181 J	0.000646 J	0.00281

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP46	EP47	EP48	EPSW01
				Sample Name	EP46_4	EP47_4	EP48_2	EPSW01_2
				Sample Date	09/23/2021	09/23/2021	10/11/2021	10/04/2021
				Sample Depth	4	4	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0062 U	<0.004 U	<0.0073 U	<0.004 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.16 U	<0.11 U	<0.2 U	<0.11 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.02 U	<0.013 U	<0.024 U	<0.013 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.02 U	<0.013 U	<0.024 U	<0.013 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0082 U	<0.0054 U	<0.0098 U	<0.0054 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0082 U	<0.0054 U	<0.0098 U	<0.0054 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.02 U	<0.013 U	<0.024 U	<0.013 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0031 U	<0.002 U	<0.0037 U	<0.002 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0082 U	<0.0054 U	<0.0098 U	<0.0054 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
Cymene	99-87-6	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.02 U	<0.013 U	<0.024 U	<0.013 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0082 U	<0.0054 U	<0.0098 U	<0.0054 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.02 U	<0.013 U	<0.024 U	<0.013 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.02 U	<0.013 U	<0.024 U	<0.013 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.01 U	<0.0067 U	<0.012 U	<0.0067 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0082 U	<0.0054 U	<0.0098 U	<0.0054 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Styrene	100-42-5	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0041 U	<0.0027 U	<0.0049 U	<0.0027 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
Toluene	108-88-3	0.7	100	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0031 U	<0.002 U	<0.0037 U	<0.002 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.01 U	<0.0067 U	<0.012 U	<0.0067 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.001 U	<0.00067 U	<0.0012 U	<0.00067 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0082 U	<0.0054 U	<0.0098 U	<0.0054 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.02 U	<0.013 U	<0.024 U	<0.013 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.002 U	<0.0013 U	<0.0024 U	<0.0013 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP46	EP47	EP48	EPSW01
				Sample Name	EP46_4	EP47_4	EP48_2	EPSW01_2
				Sample Date	09/23/2021	09/23/2021	10/11/2021	10/04/2021
				Sample Depth	4	4	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.027 U	<0.027 U	<0.028 U	<0.14 UJ
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.11 U	<0.11 U	<0.54 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.17 U	<0.81 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.88 U	<0.86 U	<0.9 U	<4.3 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.18 J	0.28	0.43	<1.1 U
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.18 U	0.035 J	<0.9 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.39 U	<0.38 U	<0.41 U	<2 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	0.061 J	0.043 J	0.1 J	<1.3 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 UJ
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.47 U	<0.46 U	<0.49 U	<2.3 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.26 U	<0.25 U	<0.26 U	<1.3 U
Acenaphthene	83-32-9	20	100	mg/kg	0.36	0.74	1.1	0.21 J
Acenaphthylene	208-96-8	100	100	mg/kg	0.6	0.48	0.75	<0.72 U
Acetophenone	98-86-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Anthracene	120-12-7	100	100	mg/kg	1.2	1.8	2.7	0.49 J
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**4.1**	**4.9**	**5.8**	**1.5**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**3.8**	**4.7**	**5.2**	**1.4**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**5.2**	**6.5**	**7.1**	**1.8**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	2.7	3.4	3.4	1
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**1.4**	**1.4**	**1.4**	0.66
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.59 U	<0.58 U	<0.61 UJ	<2.9 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	0.064 J	0.096 J	0.13 J	<2 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.19 U	<0.2 U	<0.98 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.17 U	<0.81 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.21 U	<0.23 U	<1.1 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	<0.18 U	0.064 J	0.22	1.3
Carbazole	86-74-8	NS	NS	mg/kg	0.55	0.92	1.1	0.23 J
Chrysene	218-01-9	**1**	3.9	mg/kg	**3.9**	**4.9**	**5.6**	**1.4**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.65**	**0.74**	**0.72**	0.21 J
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.38	0.62	0.8	0.12 J
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Fluoranthene	206-44-0	**100**	100	mg/kg	7	13	13	3.4
Fluorene	86-73-7	30	100	mg/kg	0.4	0.79	1	0.17 J
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.11 U	<0.11 U	<0.54 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.52 U	<0.51 U	<0.54 UJ	<2.6 UJ
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.15 U	<0.14 U	<0.15 U	<0.72 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**3**	**3.9**	**3.9**	**1.2**
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.17 U	<0.81 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.44	0.63	0.96	0.12 J
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.17 U	<0.81 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.19 U	<0.9 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.15 U	<0.14 U	<0.15 U	<0.72 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.15 U	<0.14 U	<0.15 U	<0.72 U
Phenanthrene	85-01-8	**100**	100	mg/kg	4.9	10	11	2.3
Phenol	108-95-2	**0.33**	100	mg/kg	0.035 J	0.035 J	0.054 J	<0.9 U
Pyrene	129-00-0	100	100	mg/kg	6.5	11	11	2.9
Total SVOCs	SVOCs	NS	500	mg/kg	47.42	70.938	77.499	20.41

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EP46	EP47	EP48	EPSW01
				Sample Name	EP46_4	EP47_4	EP48_2	EPSW01_2
				Sample Date	09/23/2021	09/23/2021	10/11/2021	10/04/2021
				Sample Depth	4	4	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	<0.00168 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	**0.0545 J**
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	<0.00312 U	<0.00304 U	<0.00336 U	**0.0567**
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	<0.00168 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000694 U	<0.000676 U	<0.000746 U	<0.000698 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.00208 U	<0.00203 U	<0.00224 U	0.00568 J
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	<0.00168 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	<0.00168 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	<0.00168 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0139 U	<0.0135 U	<0.0149 U	<0.014 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	<0.00168 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00104 U	<0.00101 U	<0.00112 U	0.00121 J
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000694 U	<0.000676 U	<0.000746 U	<0.000698 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000694 U	<0.000676 U	<0.000746 U	<0.000698 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00208 U	<0.00203 U	<0.00224 U	<0.0021 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00167 U	<0.00162 U	<0.00179 U	<0.00168 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000694 U	<0.000676 U	<0.000746 U	<0.000698 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	<0.00208 U	<0.00203 U	<0.00224 U	0.00462 J
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000833 U	<0.000811 U	<0.000895 U	<0.000838 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00312 U	<0.00304 U	<0.00336 U	0.000959 J
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00312 U	<0.00304 U	<0.00336 U	<0.00314 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0312 U	<0.0304 U	<0.0336 U	<0.0314 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.182 U	<0.177 U	<0.186 U	<0.181 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.182 U	<0.177 U	<0.186 U	<0.181 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.182 U	<0.177 U	<0.186 U	<0.181 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	<0.0366 U	<0.035 U	0.0114 J	0.041
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0366 U	<0.035 U	<0.0373 U	<0.0364 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	<0.0366 U	<0.035 U	0.0114 J	0.041
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	4,570	3,940	4,140	4,920
Antimony	7440-36-0	NS	NS	mg/kg	2.67 J	1.27 J	<4.33 U	4.36
Arsenic	7440-38-2	**13**	16	mg/kg	**25.4**	**17.2**	**17.8**	**16.4**
Barium	7440-39-3	**350**	400	mg/kg	134	67.7	72.8	70.1
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.313 J	0.314 J	0.269 J	0.267 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	1.23	0.746 J	0.546 J	1.77
Calcium	7440-70-2	NS	NS	mg/kg	4,990	8,270	39,600	7,630
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.881 U	<0.862 U	<0.912 U	<0.877 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	14.8	15.6	16.8	17.2
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	15	16	17	17
Cobalt	7440-48-4	NS	NS	mg/kg	14.4	9.59	5.37	5.32
Copper	7440-50-8	**50**	270	mg/kg	**143**	**95.7**	**59.7**	**64.3**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	65,500	19,900	24,000	15,300
Lead	7439-92-1	**63**	400	mg/kg	**663**	**502**	**160**	**3,720**
Magnesium	7439-95-4	NS	NS	mg/kg	1,970	3,350	21,200	3,660
Manganese	7439-96-5	1600	2000	mg/kg	568	210	200	187
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.831**	**0.599**	**0.343**	**0.331**
Nickel	7440-02-0	**30**	310	mg/kg	24.8	16.6	10.9	15.6
Potassium	7440-09-7	NS	NS	mg/kg	341	515	659	856
Selenium	7782-49-2	**3.9**	180	mg/kg	1.28 J	0.729 J	0.693 J	<1.67 U
Silver	7440-22-4	2	180	mg/kg	0.474 J	<0.848 U	<0.866 U	0.3 J
Sodium	7440-23-5	NS	NS	mg/kg	<169 U	<170 U	102 J	324
Thallium	7440-28-0	NS	NS	mg/kg	0.516 J	<1.7 U	<1.73 U	<1.67 U
Vanadium	7440-62-2	NS	NS	mg/kg	17.8	13.8	24.2	37.2
Zinc	7440-66-6	**109**	10000	mg/kg	**576**	**275**	107	**566**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	90.8	92.8	87.7	91.2
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000532 UJ	<0.000517 UJ	<0.000524 UJ	<0.000479 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000532 UJ	<0.000517 UJ	<0.000524 UJ	<0.000479 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000266 U	<0.000258 U	<0.000262 U	<0.000239 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	0.000085 J	0.00006 J	0.000025 J	0.000143 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	<0.000479 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.000197 J	0.000096 J	0.000102 J	0.000591
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	0.000276 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	<0.000479 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	0.000098 J	<0.000258 U	<0.000262 U	0.000146 J
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000266 U	<0.000258 U	<0.000262 U	<0.000239 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000235 J	0.000077 J	<0.000524 U	0.000274 J
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000542	0.000319	0.000111 J	0.000234 J
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	<0.000479 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	**0.00124 J**	**0.00111**	0.000642	**0.00311**
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000231 J	0.000283	0.000308	0.000328
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	0.0004 J	0.000112 J	<0.000524 U	0.000289 J
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	0.000145 J
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	<0.000479 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	0.000156 J	0.000059 J	0.000092 J	0.000415 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	<0.000479 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000532 U	<0.000517 U	<0.000524 U	<0.000479 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.00147 J	0.00139	0.00095	0.00344

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW02	EPSW03	EPSW04	EPSW05
				Sample Name	EPSW02_2	EPSW03_2	EPSW04_2	EPSW05_2
				Sample Date	10/04/2021	10/04/2021	12/02/2021	10/04/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0031 U	<0.005 U	<0.004 U	<0.0046 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.082 U	<0.13 U	<0.1 U	<0.12 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.01 U	<0.017 U	<0.013 U	<0.015 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.01 U	<0.017 U	<0.013 U	<0.015 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0041 U	<0.0067 U	<0.0053 U	<0.0061 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0041 U	<0.0067 U	<0.0053 U	<0.0061 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.01 U	<0.017 U	<0.013 U	<0.015 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0015 U	<0.0025 U	<0.002 U	<0.0023 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0041 U	<0.0067 U	<0.0053 U	<0.0061 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
Cymene	99-87-6	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.01 U	<0.017 U	<0.013 U	<0.015 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0041 U	<0.0067 U	<0.0053 U	<0.0061 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.01 U	<0.017 U	<0.013 U	<0.015 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.01 U	<0.017 U	<0.013 U	<0.015 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0051 U	<0.0084 U	<0.0066 U	<0.0077 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0041 U	<0.0067 U	<0.0053 U	<0.0061 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Styrene	100-42-5	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.002 U	<0.0034 U	<0.0026 U	<0.0031 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
Toluene	108-88-3	0.7	100	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0015 U	<0.0025 U	<0.002 U	<0.0023 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0051 U	<0.0084 U	<0.0066 U	<0.0077 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00051 U	<0.00084 U	<0.00066 U	<0.00077 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0041 U	<0.0067 U	<0.0053 U	<0.0061 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.01 U	<0.017 U	<0.013 U	<0.015 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.001 U	<0.0017 U	<0.0013 U	<0.0015 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW02	EPSW03	EPSW04	EPSW05
				Sample Name	EPSW02_2	EPSW03_2	EPSW04_2	EPSW05_2
				Sample Date	10/04/2021	10/04/2021	12/02/2021	10/04/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.027 UJ	<0.027 UJ	<0.15 U	<0.027 UJ
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.11 U	<0.59 U	<0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.88 U	<0.16 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.86 U	<0.85 U	<4.7 U	<0.87 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.19 J	0.028 J	<1.2 U	0.35
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.38 U	<0.38 U	<2.1 U	<0.39 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	0.042 J	<0.26 U	<1.4 U	<0.26 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 UJ	<0.18 UJ	<0.98 U	<0.18 UJ
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.46 U	<0.46 U	<2.5 U	<0.47 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.25 U	<0.25 U	<1.4 U	<0.25 U
Acenaphthene	83-32-9	20	100	mg/kg	0.58	0.066 J	<0.78 U	0.62
Acenaphthylene	208-96-8	100	100	mg/kg	0.24	0.057 J	<0.78 U	0.32
Acetophenone	98-86-2	NS	NS	mg/kg	0.033 J	<0.18 U	<0.98 U	0.1 J
Anthracene	120-12-7	100	100	mg/kg	1.3	0.2	<0.59 U	1.2
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**3.7**	0.62	0.25 J	**4.3**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**3.2**	0.5	0.25 J	**3.8**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**4.4**	0.74	0.38 J	**5**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	2.2	0.41	0.21 J	2.6
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	**1.4**	0.22	<0.59 U	**1.6**
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.58 UJ	<0.57 UJ	<3.2 UJ	<0.59 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.18 U	<0.18 U	0.25 J	<0.18 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	0.062 J	<0.4 U	<2.2 U	0.09 J
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.19 U	<0.19 U	<1 U	<0.2 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.88 U	<0.16 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.21 U	<0.21 U	<1.2 U	<0.22 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.44	0.64	0.44 J	0.71
Carbazole	86-74-8	NS	NS	mg/kg	0.84 J	0.079 J	<0.98 U	0.68 J
Chrysene	218-01-9	**1**	3.9	mg/kg	**3.5**	0.57	0.26 J	**4.2**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	**0.5**	0.083 J	<0.59 U	**0.62**
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.41	0.041 J	<0.98 U	0.49
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	0.045 J	<0.18 U	<0.98 U	0.067 J
Diethyl phthalate	84-66-2	NS	NS	mg/kg	0.017 J	<0.18 U	<0.98 U	<0.18 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
Fluoranthene	206-44-0	**100**	100	mg/kg	6	1	0.43 J	6.3
Fluorene	86-73-7	30	100	mg/kg	0.6	0.06 J	<0.98 U	0.55
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.11 U	<0.59 U	<0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.51 UJ	<0.51 UJ	<2.8 U	<0.52 UJ
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.14 U	<0.14 U	<0.78 U	<0.14 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**2.5**	0.42	0.23 J	**3**
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.88 U	<0.16 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.34	0.043 J	<0.98 U	0.67
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.16 U	<0.88 U	<0.16 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.14 U	<0.14 U	<0.78 U	<0.14 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.14 U	<0.14 U	<0.78 U	<0.14 U
Phenanthrene	85-01-8	**100**	100	mg/kg	4.7	0.88	0.23 J	4.8
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	<0.18 U	<0.98 U	<0.18 U
Pyrene	129-00-0	100	100	mg/kg	4.9	1	0.4 J	5.3
Total SVOCs	SVOCs	NS	500	mg/kg	42.139	7.657	3.33	47.367

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW02	EPSW03	EPSW04	EPSW05
				Sample Name	EPSW02_2	EPSW03_2	EPSW04_2	EPSW05_2
				Sample Date	10/04/2021	10/04/2021	12/02/2021	10/04/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	0.00158 J	0.00281 J	0.00259	<0.00174 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	**0.00759 J**	**0.011**	**0.0124**	**0.0154 J**
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.00745**	**0.0114**	**0.0143**	**0.0129 J**
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00168 U	<0.00167 U	<0.00181 U	<0.00174 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000702 U	<0.000697 U	<0.000755 U	<0.000723 U
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	0.00423 J	0.00476 J	0.00954 J	0.00439 J
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00168 U	<0.00167 U	<0.00181 U	<0.00174 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00168 U	<0.00167 U	<0.00181 UJ	<0.00174 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00168 U	<0.00167 U	<0.00181 U	<0.00174 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.014 U	<0.0139 U	0.0986	<0.0145 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00168 U	<0.00167 U	<0.00181 U	<0.00174 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	0.0011	0.00288	0.00466	<0.00108 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000702 U	<0.000697 U	<0.000755 U	<0.000723 U
Endrin	72-20-8	0.014	11	mg/kg	<0.000702 U	<0.000697 U	<0.000755 U	<0.000723 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00211 U	<0.00209 U	<0.00226 U	<0.00217 U
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00168 U	<0.00167 U	<0.00181 U	<0.00174 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000702 U	<0.000697 U	<0.000755 U	<0.000723 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	0.00384 J	0.00435 J	0.00766 J	0.00554 J
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000843 U	<0.000837 U	<0.000906 U	<0.000868 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.00316 U	0.000989 J	0.00145 J	<0.00326 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.00316 U	<0.00314 U	<0.0034 U	<0.00326 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.0316 U	<0.0314 U	<0.034 U	<0.0326 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.181 U	<0.175 U	<0.198 U	<0.183 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.181 U	<0.175 U	<0.198 U	<0.183 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.181 U	<0.175 U	<0.198 U	<0.183 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.00816 J	0.0141 J	0.018 J	0.0139 J
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0361 U	<0.0336 U	<0.0378 U	<0.0367 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.00816 J	0.0141 J	0.018 J	0.0139 J
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	5,340	5,030	5,280	4,440
Antimony	7440-36-0	NS	NS	mg/kg	0.965 J	1.77 J	<4.49 U	3.05 J
Arsenic	7440-38-2	**13**	16	mg/kg	7.77	6.39	7.81	**15.7**
Barium	7440-39-3	**350**	400	mg/kg	303	111	57.6	115
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.227 J	0.243 J	0.261 J	0.48
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	0.94	1.24	0.53 J	1.58
Calcium	7440-70-2	NS	NS	mg/kg	17,800	7,420	22,800	8,490
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.881 U	<0.856 U	<0.959 U	<0.892 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	15.9	14	11.7	20
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	16	14	12	20
Cobalt	7440-48-4	NS	NS	mg/kg	4.89	4.92	7.67	5.5
Copper	7440-50-8	**50**	270	mg/kg	46.9	46.2	37.9	**71.3**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	13,600	20,700	11,600	28,400
Lead	7439-92-1	**63**	400	mg/kg	**253**	**134**	**186**	**282**
Magnesium	7439-95-4	NS	NS	mg/kg	5,290	3,260	6,550	3,330
Manganese	7439-96-5	1600	2000	mg/kg	206	236	188	221
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.275**	**0.318**	**0.196**	**1.22**
Nickel	7440-02-0	**30**	310	mg/kg	11.5	9.86	7.88	12.7
Potassium	7440-09-7	NS	NS	mg/kg	781	622	766	633
Selenium	7782-49-2	**3.9**	180	mg/kg	<1.68 U	<1.62 U	<1.8 U	<1.68 U
Silver	7440-22-4	2	180	mg/kg	<0.839 U	<0.81 U	0.989	<0.843 U
Sodium	7440-23-5	NS	NS	mg/kg	534	281	<180 U	<168 U
Thallium	7440-28-0	NS	NS	mg/kg	<1.68 U	<1.62 U	<1.8 U	<1.68 U
Vanadium	7440-62-2	NS	NS	mg/kg	26.6	22.1	19.4	26.6
Zinc	7440-66-6	**109**	10000	mg/kg	**325**	**259**	**158**	**362**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	90.8	93.5	83.4	89.7
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000519 U	<0.000481 U	<0.000552 U	<0.000533 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000519 U	<0.000481 U	<0.000552 U	<0.000533 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.00026 U	<0.00024 U	<0.000276 U	<0.000267 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	0.000054 J	0.000061 J	0.000038 J	0.000048 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000519 U	<0.000481 U	<0.000552 U	<0.000533 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.000282	0.000287	0.000505	0.000275
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	0.000254 J	0.000145 J	0.000396 J	0.000168 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000519 U	<0.000481 U	<0.000552 U	<0.000533 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	<0.00026 U	0.00017 J	0.000094 J	0.000049 J
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.00026 U	<0.00024 U	<0.000276 U	<0.000267 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000085 J	0.000232 J	0.000129 J	0.000086 J
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000078 J	0.000275	0.000267 J	0.000246 J
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000519 U	<0.000481 U	<0.000552 U	<0.000533 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	0.000483	**0.0045**	**0.00177**	**0.00154**
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000072 J	0.000493	0.000281	0.000306
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	0.000049 J	0.000171 J	<0.000552 U	0.000115 J
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	0.000157 J	0.000082 J	0.000278 J	0.000088 J
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000519 U	<0.000481 U	0.000328 J	<0.000533 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	0.000308 J	0.00021 J	0.000492 J	0.000255 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000519 U	<0.000481 U	<0.000552 U	<0.000533 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000519 U	<0.000481 U	<0.000552 U	<0.000533 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.000555 J	0.00499	0.00205	0.00185

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW06	EPSW07	EPSW08	EPSW09
				Sample Name	EPSW06_2	EPSW07_2	EPSW08_2	EPSW09_2
				Sample Date	10/04/2021	10/04/2021	11/18/2021	11/18/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0041 U	<0.0038 U	<0.007 U	<0.0048 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.11 U	<0.1 U	<0.19 U	<0.13 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.014 U	<0.013 U	<0.023 U	<0.016 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.014 U	<0.013 U	<0.023 U	<0.016 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0055 U	<0.0051 U	<0.0094 U	<0.0063 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0055 U	<0.0051 U	<0.0094 U	<0.0063 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.014 U	<0.013 U	<0.023 U	<0.016 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.002 U	<0.0019 U	<0.0035 U	<0.0024 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0055 U	<0.0051 U	<0.0094 U	<0.0063 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.014 U	<0.013 U	<0.023 U	<0.016 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0055 U	<0.0051 U	<0.0094 U	<0.0063 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.014 U	<0.013 U	<0.023 UJ	<0.016 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.014 U	<0.013 U	<0.023 U	<0.016 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0068 U	<0.0064 U	<0.012 U	<0.0079 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0055 U	<0.0051 U	<0.0094 U	<0.0063 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0027 U	<0.0026 U	<0.0047 U	<0.0032 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00068 U	<0.00064 U	<0.0012 U	<0.00079 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.002 U	<0.0019 U	<0.0035 U	<0.0024 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0068 U	<0.0064 U	<0.012 U	<0.0079 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00068 U	0.00023 J	<0.0012 U	<0.00079 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0055 U	<0.0051 U	<0.0094 U	<0.0063 U
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.014 U	<0.013 U	<0.023 U	<0.016 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0014 U	<0.0013 U	<0.0023 U	<0.0016 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW06	EPSW07	EPSW08	EPSW09
				Sample Name	EPSW06_2	EPSW07_2	EPSW08_2	EPSW09_2
				Sample Date	10/04/2021	10/04/2021	11/18/2021	11/18/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.027 UJ	<0.028 UJ	<0.25 U	<0.14 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.11 U	<0.11 U	<1 U	<0.54 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.16 U	<0.17 U	<1.5 U	<0.81 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<0.87 U	<0.89 U	<8.1 U	<4.3 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	0.16 J	0.28	<2 U	0.12 J
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<0.39 U	<0.4 U	<3.6 U	<1.9 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	0.036 J	<0.27 U	<2.4 U	<1.3 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.18 UJ	<0.18 UJ	<1.7 U	<0.9 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<0.47 U	<0.48 U	<4.4 U	<2.3 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<0.25 U	<0.26 U	<2.4 U	<1.3 U
Acenaphthene	83-32-9	20	100	mg/kg	0.24	1.3	0.34 J	0.18 J
Acenaphthylene	208-96-8	100	100	mg/kg	0.19	0.25	0.3 J	0.15 J
Acetophenone	98-86-2	NS	NS	mg/kg	<0.18 U	0.064 J	<1.7 U	<0.9 U
Anthracene	120-12-7	100	100	mg/kg	0.51	2	0.57 J	0.56
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	**1.3**	**5.6**	**1.5**	**1.3**
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	**1.1**	**5.3**	**1.2 J**	**1.1**
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	**1.4**	**6.4**	**1.6**	**1.3**
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	0.82	3	0.69 J	0.69 J
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	0.52	**2.4**	0.61 J	0.46 J
Benzoic Acid	65-85-0	NS	NS	mg/kg	<0.59 UJ	<0.6 UJ	<5.4 UJ	<2.9 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	0.05 J	<0.18 U	<1.7 U	<0.9 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<0.41 U	0.083 J	<3.8 U	<2 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.2 U	<0.2 U	<1.8 U	<0.97 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.16 U	<0.17 U	<1.5 U	<0.81 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<0.22 U	<0.22 U	<2 U	<1.1 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.59	0.64	1.1 J	0.32 J
Carbazole	86-74-8	NS	NS	mg/kg	0.22 J	1.1 J	0.31 J	0.21 J
Chrysene	218-01-9	**1**	3.9	mg/kg	**1.3**	**5.2**	**1.4**	**1.1**
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	0.2	**0.77**	<1 U	0.15 J
Dibenzofuran	132-64-9	**7**	59	mg/kg	0.15 J	0.48	0.17 J	0.16 J
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	0.061 J	0.098 J	<1.7 U	<0.9 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
Fluoranthene	206-44-0	**100**	100	mg/kg	2.7	7.9	3	2.8
Fluorene	86-73-7	30	100	mg/kg	0.18	0.8	0.24 J	0.24 J
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.11 U	<0.11 U	<1 U	<0.54 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<0.52 UJ	<0.53 UJ	<4.8 U	<2.6 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.14 U	<0.15 U	<1.3 U	<0.72 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	**0.9**	**3.6**	**0.77 J**	**0.74**
Isophorone	78-59-1	NS	NS	mg/kg	<0.16 U	<0.17 U	<1.5 U	<0.81 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.21	0.43	<1.7 U	0.18 J
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.16 U	<0.17 U	<1.5 U	<0.81 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.14 U	<0.15 U	<1.3 U	<0.72 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.14 U	<0.15 U	<1.3 U	<0.72 U
Phenanthrene	85-01-8	**100**	100	mg/kg	2.1	5.3	2.3	2.2
Phenol	108-95-2	**0.33**	100	mg/kg	<0.18 U	<0.18 U	<1.7 U	<0.9 U
Pyrene	129-00-0	100	100	mg/kg	2.4	6.5	2.7	2.4
Total SVOCs	SVOCs	NS	500	mg/kg	17.337	59.495	18.8	16.36

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW06	EPSW07	EPSW08	EPSW09
				Sample Name	EPSW06_2	EPSW07_2	EPSW08_2	EPSW09_2
				Sample Date	10/04/2021	10/04/2021	11/18/2021	11/18/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.0017 U	<0.00171 U	<0.00156 U	<0.0165 UJ
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.0017 U	<0.00171 U	0.00153 J	<0.0165 UJ
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.0191**	**0.0166 J**	**0.023**	<0.0309 UJ
Aldrin	309-00-2	**0.005**	0.097	mg/kg	**0.00616 J**	<0.00171 U	<0.00156 U	<0.0165 UJ
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.000711 U	<0.000714 U	<0.00065 U	<0.00687 UJ
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	0.00312 J	0.0134	0.00319	<0.0206 UJ
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.0017 U	<0.00171 U	<0.00156 U	<0.0165 UJ
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.0017 U	<0.00171 U	<0.00156 U	<0.0165 UJ
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.0017 U	<0.00171 U	<0.00156 U	<0.0165 UJ
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0142 U	0.0895	0.025 J	<0.137 UJ
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.0017 U	<0.00171 U	<0.00156 U	<0.0165 UJ
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	0.00499	0.00463 J	**0.00798 J**	<0.0103 UJ
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.000711 U	<0.000714 U	<0.00065 U	<0.00687 UJ
Endrin	72-20-8	0.014	11	mg/kg	<0.000711 U	<0.000714 U	<0.00065 U	<0.00687 UJ
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.00213 U	<0.00214 U	<0.00195 U	<0.0206 UJ
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.0017 U	<0.00171 U	<0.00156 U	<0.0165 UJ
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.000711 U	<0.000714 U	<0.00065 U	<0.00687 UJ
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	0.00317 J	0.0107 J	0.00336	<0.0206 UJ
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.000853 U	<0.000857 U	<0.00078 U	<0.00824 UJ
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.0032 U	0.00127 J	0.00174 J	<0.0309 UJ
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.0032 U	<0.00321 U	<0.00292 U	<0.0309 UJ
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.032 U	<0.0321 U	<0.0292 U	<0.309 UJ
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.182 U	<0.185 U	<0.169 U	<0.178 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.182 U	<0.185 U	<0.169 U	<0.178 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.182 U	<0.185 U	<0.169 U	<0.178 U
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.0362	0.027 J	0.0919	0.0389
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0356 U	<0.0361 U	<0.0322 U	<0.035 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	0.0362	0.027 J	0.0919	0.0389
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	4,710	5,120	2,090	2,630
Antimony	7440-36-0	NS	NS	mg/kg	2.1 J	1.7 J	1.21 J	0.392 J
Arsenic	7440-38-2	**13**	16	mg/kg	9.25	11.8	7.8	5.94
Barium	7440-39-3	**350**	400	mg/kg	217	91.8	64.7	51.5
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.36 J	0.395 J	0.182 J	0.179 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	1.14	1.25	2	0.682 J
Calcium	7440-70-2	NS	NS	mg/kg	5,220	8,460	76,900	74,300
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.879 U	<0.893 U	<0.82 U	0.218 J
Chromium, Total	7440-47-3	NS	NS	mg/kg	14.3	27.3	20	9.04
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	14	27	20	8.8 J
Cobalt	7440-48-4	NS	NS	mg/kg	6.01	9.14	4.14	2.83
Copper	7440-50-8	**50**	270	mg/kg	**59.5**	**69.1**	**52.2**	33.5
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	13,700	13,800	14,900	9,080
Lead	7439-92-1	**63**	400	mg/kg	**198**	**205**	**221**	**81.4**
Magnesium	7439-95-4	NS	NS	mg/kg	3,030	2,400	57,800	51,300
Manganese	7439-96-5	1600	2000	mg/kg	192	196	250	176
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.36**	0.167	**0.255**	0.088
Nickel	7440-02-0	**30**	310	mg/kg	13.3	13.4	12.9	8.67
Potassium	7440-09-7	NS	NS	mg/kg	914	795	352	379
Selenium	7782-49-2	**3.9**	180	mg/kg	<1.68 U	<1.68 U	0.689 J	0.606 J
Silver	7440-22-4	2	180	mg/kg	<0.838 U	<0.841 U	0.412 J	<0.853 U
Sodium	7440-23-5	NS	NS	mg/kg	<168 U	<168 U	<158 U	<170 U
Thallium	7440-28-0	NS	NS	mg/kg	<1.68 U	<1.68 U	<1.58 U	<1.7 U
Vanadium	7440-62-2	NS	NS	mg/kg	24	25.2	27.6	25
Zinc	7440-66-6	**109**	10000	mg/kg	**289**	**414**	**1,520**	**149**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	91	89.6	97.5	91.6
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000515 U	0.000233 J	0.000171 J	<0.000508 UJ
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000515 U	<0.000497 U	<0.000484 U	<0.000508 UJ
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000257 U	<0.000248 U	<0.000242 U	<0.000254 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	0.000066 J	0.000024 J	0.00011 J	0.000041 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000515 U	<0.000497 U	<0.000484 U	<0.000508 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.000325	0.000498	0.000383 J	0.000175 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	0.000199 J	0.000282 J	0.000184 J	0.000166 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000515 U	<0.000497 U	<0.000484 U	<0.000508 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	0.000054 J	<0.000248 U	0.000092 J	<0.000254 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000257 U	<0.000248 U	<0.000242 U	<0.000254 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000088 J	<0.000497 U	0.000098 J	0.000108 J
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000197 J	0.000137 J	0.000279	0.000114 J
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000515 U	<0.000497 U	<0.000484 U	<0.000508 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	**0.00175**	**0.00154**	**0.00285**	**0.00148**
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.00336	0.000142 J	**0.000838**	<0.000254 U
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	0.000117 J	<0.000497 U	0.0001 J	0.000068 J
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	0.000102 J	0.000145 J	0.000091 J	0.00007 J
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000515 U	<0.000497 U	<0.000484 U	<0.000508 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	0.000257 J	0.000307 J	0.000255 J	0.000344 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000515 U	<0.000497 U	<0.000484 UJ	<0.000508 UJ
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000515 U	<0.000497 U	<0.000484 UJ	<0.000508 UJ
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.00209	0.00168 J	0.00369	0.00148

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW10	EPSW11	EPSW12	EPSW13
				Sample Name	EPSW10_2	EPSW11_2	EPSW12_2	EPSW13_2
				Sample Date	11/18/2021	11/18/2021	11/09/2021	11/09/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.011 U	<0.0055 U	<0.0044 U	<0.0036 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.3 U	<0.14 U	<0.12 U	<0.095 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.037 U	<0.018 U	<0.015 U	<0.012 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.037 U	<0.018 U	<0.015 U	<0.012 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.015 U	<0.0073 U	<0.0059 U	<0.0047 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.015 U	<0.0073 U	<0.0059 U	<0.0047 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.037 U	<0.018 U	<0.015 U	<0.012 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0056 U	<0.0027 U	<0.0022 U	<0.0018 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.015 U	<0.0073 U	<0.0059 U	<0.0047 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.037 U	<0.018 U	<0.015 U	<0.012 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.015 U	<0.0073 U	<0.0059 U	<0.0047 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.037 UJ	<0.018 UJ	<0.015 U	<0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.037 U	<0.018 U	<0.015 U	<0.012 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.018 U	<0.0091 U	<0.0073 U	<0.0059 U
Naphthalene	91-20-3	12	100	mg/kg	<0.015 U	<0.0073 U	<0.0059 U	<0.0047 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0074 U	<0.0036 U	<0.0029 U	<0.0024 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0037 U	<0.0018 U	0.0013 J	<0.0012 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0056 U	<0.0027 U	<0.0022 U	<0.0018 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.018 U	<0.0091 U	<0.0073 U	<0.0059 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.0018 U	<0.00091 U	<0.00073 U	<0.00059 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.015 U	<0.0073 U	<0.0059 UJ	<0.0047 UJ
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.037 U	<0.018 U	<0.015 U	<0.012 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0037 U	<0.0018 U	<0.0015 U	<0.0012 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW10	EPSW11	EPSW12	EPSW13
				Sample Name	EPSW10_2	EPSW11_2	EPSW12_2	EPSW13_2
				Sample Date	11/18/2021	11/18/2021	11/09/2021	11/09/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Semi-Volatile Organic Compounds								
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.14 U	<0.15 U	<0.13 U	<0.12 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.55 U	<0.59 U	<0.52 U	<0.5 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.82 U	<0.88 U	<0.78 U	<0.75 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<4.4 U	<4.7 U	<4.1 U	<4 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	<1.1 U	<1.2 U	0.16 J	<1 U
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<2 U	<2.1 U	<1.9 U	<1.8 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<1.3 U	<1.4 U	<1.2 U	<1.2 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<2.4 U	<2.5 U	<2.2 U	<2.2 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 UJ	<0.84 UJ
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<1.3 U	<1.4 U	<1.2 U	<1.2 U
Acenaphthene	83-32-9	20	100	mg/kg	<0.73 U	<0.78 U	0.34 J	<0.67 U
Acenaphthylene	208-96-8	100	100	mg/kg	<0.73 U	<0.78 U	0.44 J	<0.67 U
Acetophenone	98-86-2	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Anthracene	120-12-7	100	100	mg/kg	0.18 J	0.21 J	1.1	<0.5 U
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	0.46 J	0.71	**3**	0.23 J
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	0.43 J	0.66 J	**2.3**	<0.67 U
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	0.58	0.97	**3.3**	0.26 J
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	0.39 J	0.54 J	1.3	0.13 J
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	0.21 J	0.31 J	**1**	<0.5 U
Benzoic Acid	65-85-0	NS	NS	mg/kg	<3 UJ	<3.2 UJ	<2.8 UJ	<2.7 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<2.1 U	<2.2 U	<2 U	<1.9 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.98 U	<1 U	<0.93 U	<0.9 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.82 U	<0.88 U	<0.78 U	<0.75 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<1.1 U	<1.2 U	<1 U	<1 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	1.5	1.1	1.3	0.65 J
Carbazole	86-74-8	NS	NS	mg/kg	<0.91 U	0.1 J	0.37 J	<0.84 U
Chrysene	218-01-9	**1**	3.9	mg/kg	0.48 J	0.72	**3**	0.2 J
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	<0.55 U	0.12 J	**0.35 J**	<0.5 U
Dibenzofuran	132-64-9	**7**	59	mg/kg	<0.91 U	<0.98 U	0.25 J	<0.84 U
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.91 U	0.22 J	<0.86 U	<0.84 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Fluoranthene	206-44-0	**100**	100	mg/kg	1	1.4	6.9	0.41 J
Fluorene	86-73-7	30	100	mg/kg	<0.91 U	<0.98 U	0.36 J	<0.84 U
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.55 U	<0.59 U	<0.52 U	<0.5 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<2.6 U	<2.8 U	<2.5 U	<2.4 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.73 U	<0.78 U	<0.69 U	<0.67 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	0.37 J	**0.55 J**	**1.6**	0.15 J
Isophorone	78-59-1	NS	NS	mg/kg	<0.82 U	<0.88 U	<0.78 U	<0.75 U
Naphthalene	91-20-3	**12**	100	mg/kg	0.13 J	<0.98 U	0.27 J	<0.84 U
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.82 U	<0.88 U	<0.78 U	<0.75 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.73 U	<0.78 U	<0.69 U	<0.67 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.73 U	<0.78 U	<0.69 U	<0.67 U
Phenanthrene	85-01-8	**100**	100	mg/kg	0.76	0.93	5.4	0.27 J
Phenol	108-95-2	**0.33**	100	mg/kg	<0.91 U	<0.98 U	<0.86 U	<0.84 U
Pyrene	129-00-0	100	100	mg/kg	0.9	1.3	5.9	0.36 J
Total SVOCs	SVOCs	NS	500	mg/kg	7.39	9.84	38.64	2.66

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW10	EPSW11	EPSW12	EPSW13
				Sample Name	EPSW10_2	EPSW11_2	EPSW12_2	EPSW13_2
				Sample Date	11/18/2021	11/18/2021	11/09/2021	11/09/2021
				Sample Depth	2	2	2	2
				Unit	Result	Result	Result	Result
Pesticides								
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.00836 U	<0.00186 U	**0.00605 J**	<0.00159 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	<0.00836 U	0.0031 J	<0.0162 U	**0.00351 J**
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.0466 J**	**0.011 J**	**0.0333**	**0.0124**
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.00836 U	<0.00186 U	<0.0162 U	<0.00159 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.00348 U	<0.000776 U	<0.00676 UJ	<0.000664 UJ
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	0.0147 J	0.00641 J	0.00834 J	0.00101 J
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.00836 U	<0.00186 U	<0.0162 U	<0.00159 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.00836 U	<0.00186 U	<0.0162 U	<0.00159 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.00836 U	<0.00186 U	<0.0162 U	<0.00159 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.0696 U	<0.0155 U	<0.135 U	<0.0133 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.00836 U	<0.00186 U	<0.0162 U	<0.00159 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	<0.00522 U	<0.00116 U	<0.0101 U	<0.000997 U
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.00348 U	<0.000776 U	<0.00676 U	<0.000664 U
Endrin	72-20-8	0.014	11	mg/kg	<0.00348 U	<0.000776 U	<0.00676 U	<0.000664 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.0104 U	<0.00233 U	<0.0203 UJ	<0.00199 UJ
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.00836 U	<0.00186 U	<0.0162 U	<0.00159 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.00348 U	<0.000776 U	<0.00676 U	<0.000664 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	0.0138 J	0.00372	0.0112 J	0.00124 J
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.00418 U	<0.000931 U	<0.00811 U	<0.000797 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.0157 U	<0.00349 U	<0.0304 U	<0.00299 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.0157 U	<0.00349 U	<0.0304 U	<0.00299 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.157 U	<0.0349 U	<0.304 U	<0.0299 U
Herbicides								
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<17.7 U	<0.192 U	<0.168 U	<0.171 UJ
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<17.7 U	<0.192 U	<0.168 U	<0.171 UJ
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<17.7 U	<0.192 U	<0.168 U	<0.171 UJ
Polychlorinated Biphenyl								
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.312 J	0.0639 J	0.101	0.0462
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.0363 U	<0.0384 U	<0.0343 U	<0.0334 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	**0.312 J**	0.0639	**0.101**	0.0462
Metals								
Aluminum	7429-90-5	NS	NS	mg/kg	3,190	5,070	3,110	1,720
Antimony	7440-36-0	NS	NS	mg/kg	1.46 J	2.2 J	7.01	0.943 J
Arsenic	7440-38-2	**13**	16	mg/kg	12.1	6.24	6.89	4.69
Barium	7440-39-3	**350**	400	mg/kg	111	90.8	70.7	38.7
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.31 J	0.676	0.192 J	0.19 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	**2.73**	**3.08**	2.1	1.09
Calcium	7440-70-2	NS	NS	mg/kg	96,400	58,600	67,000	125,000
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	<0.878 U	<0.944 UJ	<0.831 UJ	<0.824 U
Chromium, Total	7440-47-3	NS	NS	mg/kg	42	38.2	24.7	10
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	**42**	**38**	25	10
Cobalt	7440-48-4	NS	NS	mg/kg	5.96	8.08	6.32	4.28
Copper	7440-50-8	**50**	270	mg/kg	**100**	**187**	**114**	**87.8**
Cyanide	57-12-5	27	27	mg/kg	NA	NA	NA	NA
Iron	7439-89-6	NS	NS	mg/kg	12,600	19,600	18,200	7,160
Lead	7439-92-1	**63**	400	mg/kg	**422**	**301**	**350**	**140**
Magnesium	7439-95-4	NS	NS	mg/kg	60,700	26,800	29,700	68,000
Manganese	7439-96-5	1600	2000	mg/kg	536	342	365	286
Mercury	7439-97-6	**0.18**	0.81	mg/kg	**0.671**	**0.223**	**0.532**	**0.206**
Nickel	7440-02-0	**30**	310	mg/kg	26.5	**38.6**	21.4	15.7
Potassium	7440-09-7	NS	NS	mg/kg	459	496	406	330
Selenium	7782-49-2	**3.9**	180	mg/kg	1.32 J	0.899 J	1.24 J	0.943 J
Silver	7440-22-4	2	180	mg/kg	0.766 J	0.612 J	0.336 J	<0.792 U
Sodium	7440-23-5	NS	NS	mg/kg	<172 U	200	<160 U	<158 U
Thallium	7440-28-0	NS	NS	mg/kg	<1.72 U	<1.85 U	<1.6 U	<1.58 U
Vanadium	7440-62-2	NS	NS	mg/kg	54.2	32.1	34.2	26.9
Zinc	7440-66-6	**109**	10000	mg/kg	**1,310**	**1,280**	**840**	**533**
General Chemistry								
Total Solids	TSOLID	NS	NS	Percent	91.1	84.7	96.3	97.1
PFAS								
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	0.000406 J	0.000552	0.000246 J	<0.000501 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000508 UJ	<0.000517 U	<0.000503 U	<0.000501 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000254 U	<0.000258 U	<0.000251 U	<0.00025 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	0.000319 J	0.00013 J	0.000099 J	0.000045 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	0.00039 J	0.000273 J	<0.000503 U	<0.000501 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.00194	0.000576	0.000591	0.00022 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	0.000789	0.00107	0.00103	0.000202 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000508 U	<0.000517 U	<0.000503 U	<0.000501 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	0.000912	0.000059 J	0.00012 J	<0.00025 UJ
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	0.000161 J	<0.000258 U	<0.000251 U	<0.00025 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000697	0.000094 J	0.000114 J	<0.000501 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000945	0.000113 J	0.000146 J	<0.00025 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000508 U	<0.000517 U	<0.000503 U	<0.000501 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	**0.00572**	**0.0017 J**	**0.00178**	0.000828
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	**0.00202**	0.000174 J	0.000301 J	0.000119 J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	0.000925	0.000115 J	0.000145 J	<0.000501 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	0.000357 J	0.000578 J	0.000619	0.000101 J
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	0.000464 J	0.000744	0.00065 J	<0.000501 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	0.00156	0.00136	0.00101	0.000216 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000508 UJ	<0.000517 UJ	<0.000503 U	<0.000501 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000508 UJ	<0.000517 UJ	<0.000503 U	<0.000501 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.00774	0.00187 J	0.00208	0.000947 J

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW14
				Sample Name	EPSW14_2
				Sample Date	11/09/2021
				Sample Depth	2
				Unit	Result
Volatile Organic Compounds					
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	mg/kg	<0.00077 U
1,1,1-Trichloroethane	71-55-6	0.68	100	mg/kg	<0.00077 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	mg/kg	<0.00077 U
1,1,2-Trichloroethane	79-00-5	NS	NS	mg/kg	<0.0015 U
1,1-Dichloroethane	75-34-3	0.27	26	mg/kg	<0.0015 U
1,1-Dichloroethene	75-35-4	0.33	100	mg/kg	<0.0015 U
1,1-Dichloropropene	563-58-6	NS	NS	mg/kg	<0.00077 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	mg/kg	<0.0031 U
1,2,3-Trichloropropane	96-18-4	NS	NS	mg/kg	<0.0031 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	mg/kg	<0.0031 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.0031 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	mg/kg	<0.0031 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	mg/kg	<0.0046 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	mg/kg	<0.0015 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.0031 U
1,2-Dichloroethane	107-06-2	0.02	3.1	mg/kg	<0.0015 U
1,2-Dichloropropane	78-87-5	NS	NS	mg/kg	<0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52	mg/kg	<0.0031 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.0031 U
1,3-Dichloropropane	142-28-9	NS	NS	mg/kg	<0.0031 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.0031 U
1,4-Diethyl Benzene	105-05-5	NS	NS	mg/kg	<0.0031 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.12 U
2,2-Dichloropropane	594-20-7	NS	NS	mg/kg	<0.0031 U
2-Chlorotoluene	95-49-8	NS	NS	mg/kg	<0.0031 U
2-Hexanone (MBK)	591-78-6	NS	NS	mg/kg	<0.015 U
4-Chlorotoluene	106-43-4	NS	NS	mg/kg	<0.0031 U
4-Ethyltoluene	622-96-8	NS	NS	mg/kg	<0.0031 U
Acetone	67-64-1	**0.05**	100	mg/kg	<0.015 U
Acrylonitrile	107-13-1	NS	NS	mg/kg	<0.0061 U
Benzene	71-43-2	0.06	4.8	mg/kg	<0.00077 U
Bromobenzene	108-86-1	NS	NS	mg/kg	<0.0031 U
Bromochloromethane	74-97-5	NS	NS	mg/kg	<0.0031 U
Bromodichloromethane	75-27-4	NS	NS	mg/kg	<0.00077 U
Bromoform	75-25-2	NS	NS	mg/kg	<0.0061 U
Bromomethane	74-83-9	NS	NS	mg/kg	<0.0031 U
Carbon Disulfide	75-15-0	NS	NS	mg/kg	<0.015 U
Carbon Tetrachloride	56-23-5	0.76	2.4	mg/kg	<0.0015 U
Chlorobenzene	108-90-7	1.1	100	mg/kg	<0.00077 U
Chloroethane	75-00-3	NS	NS	mg/kg	<0.0031 U
Chloroform	67-66-3	0.37	49	mg/kg	<0.0023 U
Chloromethane	74-87-3	NS	NS	mg/kg	<0.0061 U
Cis-1,2-Dichloroethene	156-59-2	0.25	100	mg/kg	<0.0015 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	mg/kg	<0.00077 U
Cymene	99-87-6	NS	NS	mg/kg	<0.0015 U
Dibromochloromethane	124-48-1	NS	NS	mg/kg	<0.0015 U
Dibromomethane	74-95-3	NS	NS	mg/kg	<0.0031 U
Dichlorodifluoromethane	75-71-8	NS	NS	mg/kg	<0.015 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	mg/kg	<0.0031 U
Ethylbenzene	100-41-4	1	41	mg/kg	<0.0015 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.0061 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	mg/kg	<0.0015 U
M,P-Xylene	179601-23-1	NS	NS	mg/kg	<0.0031 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100	mg/kg	<0.015 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	mg/kg	<0.015 U
Methylene Chloride	75-09-2	0.05	100	mg/kg	<0.0077 U
Naphthalene	91-20-3	12	100	mg/kg	<0.0061 U
n-Butylbenzene	104-51-8	12	100	mg/kg	<0.0015 U
n-Propylbenzene	103-65-1	3.9	100	mg/kg	<0.0015 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	mg/kg	<0.0015 U
Sec-Butylbenzene	135-98-8	11	100	mg/kg	<0.0015 U
Styrene	100-42-5	NS	NS	mg/kg	<0.0015 U
T-Butylbenzene	98-06-6	5.9	100	mg/kg	<0.0031 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	100	mg/kg	<0.0031 U
Tetrachloroethene (PCE)	127-18-4	1.3	19	mg/kg	<0.00077 U
Toluene	108-88-3	0.7	100	mg/kg	<0.0015 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	mg/kg	<0.0015 U
Total Xylenes	1330-20-7	0.26	100	mg/kg	<0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	mg/kg	<0.00077 U
Trans-1,2-Dichloroethene	156-60-5	0.19	100	mg/kg	<0.0023 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	mg/kg	<0.0015 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	mg/kg	<0.0077 U
Trichloroethene (TCE)	79-01-6	0.47	21	mg/kg	<0.00077 U
Trichlorofluoromethane	75-69-4	NS	NS	mg/kg	<0.0061 UJ
Vinyl Acetate	108-05-4	NS	NS	mg/kg	<0.015 U
Vinyl Chloride	75-01-4	0.02	0.9	mg/kg	<0.0015 U

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW14
				Sample Name	EPSW14_2
				Sample Date	11/09/2021
				Sample Depth	2
				Unit	Result
Semi-Volatile Organic Compounds					
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	mg/kg	<0.86 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	mg/kg	<0.86 U
1,2-Dichlorobenzene	95-50-1	1.1	100	mg/kg	<0.86 U
1,3-Dichlorobenzene	541-73-1	2.4	49	mg/kg	<0.86 U
1,4-Dichlorobenzene	106-46-7	1.8	13	mg/kg	<0.86 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13	mg/kg	<0.13 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	mg/kg	<0.86 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	mg/kg	<0.52 U
2,4-Dichlorophenol	120-83-2	NS	NS	mg/kg	<0.78 U
2,4-Dimethylphenol	105-67-9	NS	NS	mg/kg	<0.86 U
2,4-Dinitrophenol	51-28-5	NS	NS	mg/kg	<4.1 U
2,4-Dinitrotoluene	121-14-2	NS	NS	mg/kg	<0.86 U
2,6-Dinitrotoluene	606-20-2	NS	NS	mg/kg	<0.86 U
2-Chloronaphthalene	91-58-7	NS	NS	mg/kg	<0.86 U
2-Chlorophenol	95-57-8	NS	NS	mg/kg	<0.86 U
2-Methylnaphthalene	91-57-6	NS	NS	mg/kg	<1 U
2-Methylphenol (o-Cresol)	95-48-7	0.33	100	mg/kg	<0.86 U
2-Nitroaniline	88-74-4	NS	NS	mg/kg	<0.86 U
2-Nitrophenol	88-75-5	NS	NS	mg/kg	<1.9 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	**0.33**	100	mg/kg	<1.2 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	mg/kg	<0.86 U
3-Nitroaniline	99-09-2	NS	NS	mg/kg	<0.86 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	mg/kg	<2.2 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	mg/kg	<0.86 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	mg/kg	<0.86 U
4-Chloroaniline	106-47-8	NS	NS	mg/kg	<0.86 UJ
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	mg/kg	<0.86 U
4-Nitroaniline	100-01-6	NS	NS	mg/kg	<0.86 U
4-Nitrophenol	100-02-7	NS	NS	mg/kg	<1.2 U
Acenaphthene	83-32-9	20	100	mg/kg	<0.69 U
Acenaphthylene	208-96-8	100	100	mg/kg	<0.69 U
Acetophenone	98-86-2	NS	NS	mg/kg	<0.86 U
Anthracene	120-12-7	100	100	mg/kg	<0.52 U
Benzo(a)anthracene	56-55-3	**1**	1	mg/kg	0.29 J
Benzo(a)pyrene	50-32-8	**1**	1	mg/kg	0.27 J
Benzo(b)fluoranthene	205-99-2	**1**	1	mg/kg	0.36 J
Benzo(g,h,i)Perylene	191-24-2	100	100	mg/kg	0.19 J
Benzo(k)fluoranthene	207-08-9	**0.8**	3.9	mg/kg	<0.52 U
Benzoic Acid	65-85-0	NS	NS	mg/kg	<2.8 UJ
Benzyl Alcohol	100-51-6	NS	NS	mg/kg	<0.86 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	mg/kg	<0.86 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	mg/kg	<2 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	mg/kg	<0.93 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	mg/kg	<0.78 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	mg/kg	<1 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	mg/kg	0.96
Carbazole	86-74-8	NS	NS	mg/kg	<0.86 U
Chrysene	218-01-9	**1**	3.9	mg/kg	0.31 J
Dibenz(a,h)anthracene	53-70-3	**0.33**	0.33	mg/kg	<0.52 U
Dibenzofuran	132-64-9	**7**	59	mg/kg	<0.86 U
Dibutyl phthalate	84-74-2	NS	NS	mg/kg	<0.86 U
Diethyl phthalate	84-66-2	NS	NS	mg/kg	<0.86 U
Dimethyl phthalate	131-11-3	NS	NS	mg/kg	<0.86 U
Dioctyl phthalate	117-84-0	NS	NS	mg/kg	<0.86 U
Fluoranthene	206-44-0	**100**	100	mg/kg	0.52
Fluorene	86-73-7	30	100	mg/kg	<0.86 U
Hexachlorobenzene	118-74-1	0.33	1.2	mg/kg	<0.52 U
Hexachlorobutadiene	87-68-3	NS	NS	mg/kg	<0.86 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	mg/kg	<2.5 U
Hexachloroethane	67-72-1	NS	NS	mg/kg	<0.69 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	0.5	mg/kg	0.22 J
Isophorone	78-59-1	NS	NS	mg/kg	<0.78 U
Naphthalene	91-20-3	**12**	100	mg/kg	<0.86 U
Nitrobenzene	98-95-3	NS	NS	mg/kg	<0.78 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	mg/kg	<0.86 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	mg/kg	<0.69 U
Pentachlorophenol	87-86-5	0.8	6.7	mg/kg	<0.69 U
Phenanthrene	85-01-8	**100**	100	mg/kg	0.32 J
Phenol	108-95-2	**0.33**	100	mg/kg	<0.86 U
Pyrene	129-00-0	100	100	mg/kg	0.46 J
Total SVOCs	SVOCs	NS	500	mg/kg	3.9

Table 2
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Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	Track 4 Site-Specific SCOs	Location	EPSW14
				Sample Name	EPSW14_2
				Sample Date	11/09/2021
				Sample Depth	2
				Unit	Result
Pesticides					
4,4'-DDD	72-54-8	**0.0033**	13	mg/kg	<0.0168 U
4,4'-DDE	72-55-9	**0.0033**	8.9	mg/kg	**0.0163 J**
4,4'-DDT	50-29-3	**0.0033**	7.9	mg/kg	**0.0346 J**
Aldrin	309-00-2	**0.005**	0.097	mg/kg	<0.0168 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.48	mg/kg	<0.00698 UJ
Alpha Chlordane	5103-71-9	0.094	4.2	mg/kg	<0.021 U
Alpha Endosulfan	959-98-8	2.4	24	mg/kg	<0.0168 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36	mg/kg	<0.0168 U
Beta Endosulfan	33213-65-9	2.4	24	mg/kg	<0.0168 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	mg/kg	<0.14 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100	mg/kg	<0.0168 U
Dieldrin	60-57-1	**0.005**	0.2	mg/kg	**0.00796 J**
Endosulfan Sulfate	1031-07-8	2.4	24	mg/kg	<0.00698 U
Endrin	72-20-8	0.014	11	mg/kg	<0.00698 U
Endrin Aldehyde	7421-93-4	NS	NS	mg/kg	<0.021 UJ
Endrin Ketone	53494-70-5	NS	NS	mg/kg	<0.0168 U
Gamma Bhc (Lindane)	58-89-9	0.1	1.3	mg/kg	<0.00698 U
Gamma Chlordane	5103-74-2	NS	NS	mg/kg	0.00884 J
Heptachlor	76-44-8	0.042	2.1	mg/kg	<0.00838 U
Heptachlor Epoxide	1024-57-3	NS	NS	mg/kg	<0.0314 U
Methoxychlor	72-43-5	NS	NS	mg/kg	<0.0314 U
Toxaphene	8001-35-2	NS	NS	mg/kg	<0.314 U
Herbicides					
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	mg/kg	<0.175 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	mg/kg	<0.175 U
Silvex (2,4,5-Tp)	93-72-1	3.8	100	mg/kg	<0.175 U
Polychlorinated Biphenyl					
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	mg/kg	<0.035 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	mg/kg	<0.035 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	mg/kg	<0.035 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	mg/kg	<0.035 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	mg/kg	<0.035 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	mg/kg	<0.035 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	mg/kg	0.127
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	mg/kg	<0.035 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	mg/kg	<0.035 U
Total PCBs	1336-36-3	**0.1**	1	mg/kg	**0.127**
Metals					
Aluminum	7429-90-5	NS	NS	mg/kg	1,130
Antimony	7440-36-0	NS	NS	mg/kg	0.366 J
Arsenic	7440-38-2	**13**	16	mg/kg	7.06
Barium	7440-39-3	**350**	400	mg/kg	48.7
Beryllium	7440-41-7	**7.2**	72	mg/kg	0.292 J
Cadmium	7440-43-9	**2.5**	4.3	mg/kg	1.32
Calcium	7440-70-2	NS	NS	mg/kg	151,000
Chromium, Hexavalent	18540-29-9	**1**	110	mg/kg	0.266 J
Chromium, Total	7440-47-3	NS	NS	mg/kg	13.8
Chromium, Trivalent	16065-83-1	**30**	180	mg/kg	14 J
Cobalt	7440-48-4	NS	NS	mg/kg	4.1
Copper	7440-50-8	**50**	270	mg/kg	**71.1**
Cyanide	57-12-5	27	27	mg/kg	NA
Iron	7439-89-6	NS	NS	mg/kg	8,230
Lead	7439-92-1	**63**	400	mg/kg	**159**
Magnesium	7439-95-4	NS	NS	mg/kg	85,600
Manganese	7439-96-5	1600	2000	mg/kg	248
Mercury	7439-97-6	**0.18**	0.81	mg/kg	<0.067 U
Nickel	7440-02-0	**30**	310	mg/kg	17.1
Potassium	7440-09-7	NS	NS	mg/kg	221
Selenium	7782-49-2	**3.9**	180	mg/kg	1.16 J
Silver	7440-22-4	2	180	mg/kg	0.258 J
Sodium	7440-23-5	NS	NS	mg/kg	<167 U
Thallium	7440-28-0	NS	NS	mg/kg	<1.67 U
Vanadium	7440-62-2	NS	NS	mg/kg	58
Zinc	7440-66-6	**109**	10000	mg/kg	**390**
General Chemistry					
Total Solids	TSOLID	NS	NS	Percent	94
PFAS					
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	mg/kg	<0.000524 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	mg/kg	<0.000524 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	mg/kg	<0.000262 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	mg/kg	0.00016 J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	mg/kg	<0.000524 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	mg/kg	0.0001 J
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	mg/kg	0.00009 J
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	mg/kg	<0.000524 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	mg/kg	0.000066 J
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	mg/kg	<0.000262 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	mg/kg	0.000072 J
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	mg/kg	0.000118 J
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	mg/kg	<0.000524 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	NS	mg/kg	**0.00261**
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0011	mg/kg	0.000376
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	mg/kg	0.000087 J
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	mg/kg	<0.000524 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	mg/kg	<0.000524 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	mg/kg	0.000075 J
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	mg/kg	<0.000524 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	mg/kg	<0.000524 U
Total PFOA and PFOS	TOTPFOAPFOS	NS	NS	mg/kg	0.00299

Table 2
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results

45 Commercial Street
Brooklyn, New York
NYSDEC BCP Site No.: C224304
Langan Project No.: 170229024

Notes:
CAS - Chemical Abstract Service
NS - No standard
mg/kg - milligram per kilogram
PFAS - per- and polyfluoroalkyl substances
PFOA - perfluorooctanoic acid
NA - Not analyzed
RL - Reporting limit
<RL - Not detected

Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use and Track 4 Site-Specific Soil Cleanup Objectives (SCO). The Track 4 Site-Specific SCOs include the NYCRR Part 375 Restricted Use Restricted-Residential SCOs for VOCs, SVOCs, PCBs, pesticides, herbicides, and metals, and site-specific values for total SVOCs (500 mg/kg) and PFOA (0.0011 mg/kg).

Criterion comparisons for 3- & 4-methylphenol (m&p cresol) are provided for reference. Promulgated SCOs are for 3-methylphenol (m-cresol) and 4-methylphenol (p-cresol).

Qualifiers:
J - The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ - The analyte was not detected at a level greater than or equal to the RL; however, the reported RL is approximate and may be inaccurate or imprecise.
U - The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:
10 - Result exceeds Unrestricted Use SCOs
10 - Result exceeds Track 4 Site-Specific SCOs

Table 3
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results - Exceeding Track 4 SCOs

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	Track 4 Site-Specific SCOs	Location	EP01	EP02	EP04	EP05	EP06	EP07	EP08	EP10	EP10
			Sample Name	EP01_2	EP02_2	EP04_2	EP05_2	EP06_2	EP07_2	EP08_2	EP10_2	EPDUP01_083021
			Sample Date	08/03/2021	08/03/2021	08/11/2021	08/10/2021	08/24/2021	08/04/2021	08/04/2021	08/30/2021	08/30/2021
			Sample Depth	2	2	2	2	2	2	2	2	2
			Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds												
Benzo(a)anthracene	56-55-3	**1**	mg/kg	**2.7**	**2.7**	**1.9**	**2.9**	0.98	**2**	0.86	0.86	0.84
Benzo(a)pyrene	50-32-8	**1**	mg/kg	**2.2**	**2.3**	**1.8**	**2.6**	0.93	**2**	0.85	0.8	0.84
Benzo(b)fluoranthene	205-99-2	**1**	mg/kg	**2.8**	**3**	**2.2**	**3.1**	**1.2**	**2.5**	**1.1**	**1.2**	**1.1**
Benzo(k)fluoranthene	207-08-9	**3.9**	mg/kg	0.86	0.76	0.94	1.3	0.33	0.73	0.28	0.34	0.36
Chrysene	218-01-9	**3.9**	mg/kg	2.6	2.6	2	2.7	0.91	2	0.84	0.96	0.97
Dibenz(a,h)anthracene	53-70-3	**0.33**	mg/kg	**0.38**	**0.41**	**0.37**	**0.53**	0.14	0.32	0.14	0.16	0.15
Fluoranthene	206-44-0	**100**	mg/kg	5	5.2	3	4.4	1.9	4.1	1.8	1.7	1.6
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	mg/kg	**1.6**	**1.6**	**1.4**	**2.1**	**0.64**	**1.4**	**0.64**	**0.64**	**0.66**
Phenanthrene	85-01-8	**100**	mg/kg	4	4.5	2.8	3.2	1.3	3.4	1.5	1.4	1.4
Total SVOCs	SVOCs	**500**	mg/kg	32.912	34.644	24.965	32.452	12.252	27.197	12.001	14.152	13.347
Metals												
Arsenic	7440-38-2	**16**	mg/kg	15.7	14.4	**30.9**	**82.5 J**	9.3	15	12.1	**18.4**	15.6
Barium	7440-39-3	**400**	mg/kg	134	118	112	329 J	**1,360**	143	99.1	136	121
Copper	7440-50-8	**270**	mg/kg	118	174	148	267 J	96.4	109	59.7	**471**	**529**
Lead	7439-92-1	**400**	mg/kg	**483**	320	216	**712 J**	**3,750**	297	129	330	385
Mercury	7439-97-6	**0.81**	mg/kg	0.335	0.279	0.53	0.65	0.244 J	0.233 J	0.214	0.249	0.248
PFAS												
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.0011**	mg/kg	<0.00026 U	0.000061 J	0.000158 J	0.000087 J	0.000867	0.000055 J	0.000051 J	0.0002 J	0.000198 J

Table 3
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results - Exceeding Track 4 SCOs

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	Track 4 Site-Specific SCOs	Location	EP11	EP12	EP13	EP14	EP15	EP16	EP17	EP18	EP20
			Sample Name	EP11_2	EP12_2	EP13_2	EP14_2	EP15_2	EP16_8	EP17_2	EP18_2	EP20_4
			Sample Date	08/25/2021	08/24/2021	08/04/2021	08/04/2021	10/20/2021	08/30/2021	08/25/2021	08/24/2021	08/09/2021
			Sample Depth	2	2	2	2	2	8	2	2	4
			Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds												
Benzo(a)anthracene	56-55-3	**1**	mg/kg	**3.5**	**3.7**	**1.3**	0.58	**1.6**	**2.2**	**2**	**5.3**	**2.1**
Benzo(a)pyrene	50-32-8	**1**	mg/kg	**3.3**	**3**	**1.1**	0.63	**1.4**	**2.3**	**1.9**	**4.7**	**1.9**
Benzo(b)fluoranthene	205-99-2	**1**	mg/kg	**4.2**	**4.1**	**1.5**	0.79	**2**	**3**	**2.5**	**6.3**	**2.7**
Benzo(k)fluoranthene	207-08-9	**3.9**	mg/kg	1.4	1	0.39	0.27	0.52	1	0.82	1.5	0.81 J
Chrysene	218-01-9	**3.9**	mg/kg	3.2	3.2	1.2	0.65	1.6	2.4	1.9	**4.6**	2.3
Dibenz(a,h)anthracene	53-70-3	**0.33**	mg/kg	**0.49 J**	**0.44**	0.18	0.12	0.32	**0.39**	0.29	**0.6**	0.3 J
Fluoranthene	206-44-0	**100**	mg/kg	6.8	5.7	2.5	0.89	3	4.4	4.2	13	4.5
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	mg/kg	**2.3**	**2**	**0.83**	**0.6**	**1.1**	**1.8**	**1.4**	**3**	**1.4 J**
Phenanthrene	85-01-8	**100**	mg/kg	5.4	2.8	2	0.68	2.7	3.2	3.1	10	3.7
Total SVOCs	SVOCs	**500**	mg/kg	42.57	35.14	16.587	8.439	21.463	29.851	25.618	69.391	28.1
Metals												
Arsenic	7440-38-2	**16**	mg/kg	**33.5**	14.5	8.16	8.38	10.6	13 J	10.6	12.8	**21.3**
Barium	7440-39-3	**400**	mg/kg	106	237	330	190	111	102	**405**	108	74.3
Copper	7440-50-8	**270**	mg/kg	150	204	33.2	52.8	114	75.2 J	**926**	136	39
Lead	7439-92-1	**400**	mg/kg	284	**639**	101	264	**414**	254 J	**1,820**	307	132
Mercury	7439-97-6	**0.81**	mg/kg	**1.02**	0.299	0.064 J	0.117	0.232	0.394 J	0.152	0.79	0.181
PFAS												
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.0011**	mg/kg	<0.00028 U	0.000132 J	<0.000243 U	0.000324	0.000115 J	0.000118 J	<0.000267 UJ	0.000108 J	0.000063 J

Table 3
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results - Exceeding Track 4 SCOs

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	Track 4 Site-Specific SCOs	Location	EP21	EP22	EP23	EP25	EP26	EP27	EP28	EP28	EP29
			Sample Name	EP21_2	EP22_8	EP23_8	EP25_2	EP26_2	EP27_2	EP28_2	EPDUP02_110321	EP29_2
			Sample Date	10/20/2021	08/30/2021	08/31/2021	08/17/2021	08/17/2021	11/03/2021	11/03/2021	11/03/2021	09/10/2021
			Sample Depth	2	8	8	2	2	2	2	2	2
			Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds												
Benzo(a)anthracene	56-55-3	**1**	mg/kg	**4**	**2.4**	**2.3**	**1.2**	**6.4**	**9**	**15 J**	**37 J**	**9.6**
Benzo(a)pyrene	50-32-8	**1**	mg/kg	**3.6**	**2.4**	**2.3**	**1.2**	**5.4**	**9.3**	**17 J**	**38 J**	**7.6**
Benzo(b)fluoranthene	205-99-2	**1**	mg/kg	**5.1**	**3.2**	**2.8**	**1.5**	**7.9**	**11**	**22 J**	**46 J**	**9.4**
Benzo(k)fluoranthene	207-08-9	**3.9**	mg/kg	0.78	0.86	0.99	0.47	**1.6**	3.8	**7.3 J**	**16 J**	3.5
Chrysene	218-01-9	**3.9**	mg/kg	3.5	2.6	2.3	1.2	**5.4**	**8.4**	**18 J**	**38 J**	**8.9**
Dibenz(a,h)anthracene	53-70-3	**0.33**	mg/kg	**0.84**	**0.4**	**0.35**	0.19	**0.78**	**1.2**	**3.1**	**5.9**	**1.1**
Fluoranthene	206-44-0	**100**	mg/kg	6.5	4.5	4.2	2.1	16	21	46 J	**110 J**	20
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	mg/kg	**2.9**	**1.9**	**1.6**	**0.91**	**3.9**	**5.4**	**13 J**	**26 J**	**5.3**
Phenanthrene	85-01-8	**100**	mg/kg	5.7	3.5	3.3	1.2	14	19	41 J	**110 J**	19
Total SVOCs	SVOCs	**500**	mg/kg	48.727	30.838	28.528	14.377	92.893	126.28	274.21	**652.16**	121.83
Metals												
Arsenic	7440-38-2	**16**	mg/kg	11.7	14.8	6.97	**33.4**	**13.2**	7.2	8.4 J	**26.6 J**	9.52
Barium	7440-39-3	**400**	mg/kg	139	268	87.5	119	113	94.2	104	154	72.2
Copper	7440-50-8	**270**	mg/kg	82.3	98.4	74.2	123	92.1	52.9	65 J	106	61.5
Lead	7439-92-1	**400**	mg/kg	266	**542**	284	252	250	**872**	380	**442**	302
Mercury	7439-97-6	**0.81**	mg/kg	0.482	0.374	**0.846**	0.153 J	0.613	0.492	**1.16 J**	0.426 J	0.513
PFAS												
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.0011**	mg/kg	0.000096 J	0.000162 J	0.000137 J	<0.000279 U	<0.000254 U	0.000075 J	<0.000259 U	<0.000269 U	<0.000258 U

Table 3
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results - Exceeding Track 4 SCOs

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	Track 4 Site-Specific SCOs	Location	EP30	EP31	EP32	EP33	EP34	EP35	EP38	EP39	EP40
			Sample Name	EP30_2	EP31_2	EP32_2	EP33_2	EP34_2	EP35_5	EP38_9	EP39_2	EP40_5
			Sample Date	10/08/2021	08/19/2021	08/19/2021	08/17/2021	11/03/2021	09/10/2021	09/23/2021	12/02/2021	09/23/2021
			Sample Depth	2	2	2	2	2	5	4	2	5
			Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds												
Benzo(a)anthracene	56-55-3	**1**	mg/kg	**10**	**3.2**	0.93	**2.5**	**9.5**	**10**	**23**	**3 J**	**3.8**
Benzo(a)pyrene	50-32-8	**1**	mg/kg	**9.7**	**2.9**	0.92	**2.4**	**9**	**8.7**	**19**	**2.5 J**	**3.4**
Benzo(b)fluoranthene	205-99-2	**1**	mg/kg	**13**	**3.3**	**1.2**	**3.2**	**11**	**11**	**24**	**3.3 J**	**4.4**
Benzo(k)fluoranthene	207-08-9	**3.9**	mg/kg	2.7	0.97	0.29	0.7	3.3	3.6	2.6	1 J	1.2
Chrysene	218-01-9	**3.9**	mg/kg	**10**	3.3	0.88	2.2	**9.3**	**10**	**23**	3.1 J	3.5
Dibenz(a,h)anthracene	53-70-3	**0.33**	mg/kg	**1.5**	**0.4**	0.14	0.33	**1.5**	**1.2**	**2**	**0.46 J**	**0.51**
Fluoranthene	206-44-0	**100**	mg/kg	27	5	1.6	5.7	22	22	42	5.1 J	6
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	mg/kg	**6.7**	**1.8**	**0.65**	**1.9**	**6.4**	**6.2**	**12**	**1.8 J**	**2.4**
Phenanthrene	85-01-8	**100**	mg/kg	23	3.3	0.75	4	19	20	36	5.1 J	4.9
Total SVOCs	SVOCs	**500**	mg/kg	146.45	34.34	10.293	33.075	127.09	133.96	257.314	35.813	42.108
Metals												
Arsenic	7440-38-2	**16**	mg/kg	11.3	10.8	**20.3**	12.4	9.62	12.2	4.76	**24.5 J**	6.91
Barium	7440-39-3	**400**	mg/kg	82.2	100	93.8	98.7	79	59.3	90.6	360 J	58.7
Copper	7440-50-8	**270**	mg/kg	65.4	108	74.6	66	58.4	97.8	118	97	41.7
Lead	7439-92-1	**400**	mg/kg	156	218	204	212	295	217	381	**547 J**	**500**
Mercury	7439-97-6	**0.81**	mg/kg	0.551	0.488	0.494	0.479	0.32	0.219	**4.59**	**0.95 J**	0.216
PFAS												
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.0011**	mg/kg	0.000146 J	<0.000291 U	0.000138 J	0.000118 J	0.000065 J	0.000097 J	0.000142 J	0.000483	0.000208 J

Table 3
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results - Exceeding Track 4 SCOs

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	Track 4 Site-Specific SCOs	**Location**	EP41	EP42	EP43	EP44	EP45	EP46	EP47	EP48	EPSW01
			Sample Name	EP41_9	EP42_2	EP43_2	EP44_2	EP45_2	EP46_4	EP47_4	EP48_2	EPSW01_2
			Sample Date	09/16/2021	10/08/2021	10/25/2021	10/25/2021	12/02/2021	09/23/2021	09/23/2021	10/11/2021	10/04/2021
			Sample Depth	9	2	2	2	2	4	4	2	2
			Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds												
Benzo(a)anthracene	56-55-3	**1**	mg/kg	**4.7**	**9.7**	**4**	**41**	**2.1**	**4.1**	**4.9**	**5.8**	**1.5**
Benzo(a)pyrene	50-32-8	**1**	mg/kg	**5.4**	**8.6**	**4.3**	**39**	**1.8**	**3.8**	**4.7**	**5.2**	**1.4**
Benzo(b)fluoranthene	205-99-2	**1**	mg/kg	**5.1**	**10**	**5.6**	**51**	**2.4**	**5.2**	**6.5**	**7.1**	**1.8**
Benzo(k)fluoranthene	207-08-9	**3.9**	mg/kg	1.8	2.5	1.4	**13**	0.73	1.4	1.4	1.4	0.66
Chrysene	218-01-9	**3.9**	mg/kg	**4.5**	**8.6**	**4**	**37**	2.1	3.9	**4.9**	**5.6**	1.4
Dibenz(a,h)anthracene	53-70-3	**0.33**	mg/kg	**0.61**	**1.1**	**0.53**	**6**	0.29	**0.65**	**0.74**	**0.72**	0.21 J
Fluoranthene	206-44-0	**100**	mg/kg	7	25	13	100	4.3	7	13	13	3.4
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	mg/kg	**3**	**5.3**	**2.7**	**24**	**1.3**	**3**	**3.9**	**3.9**	**1.2**
Phenanthrene	85-01-8	**100**	mg/kg	11	24	6.1	100	4	4.9	10	11	2.3
Total SVOCs	SVOCs	**500**	mg/kg	58.644	138.347	60.902	598.1	27.101	47.42	70.938	77.499	20.41
Metals												
Arsenic	7440-38-2	**16**	mg/kg	12.2	**19.3**	11.6	11.7	13.7	**25.4**	**17.2**	**17.8**	**16.4**
Barium	7440-39-3	**400**	mg/kg	118	94.1	317	241	**440 J**	134	67.7	72.8	70.1
Copper	7440-50-8	**270**	mg/kg	86.9 J	75	44.2	87.2	82.4 J	143	95.7	59.7	64.3
Lead	7439-92-1	**400**	mg/kg	**512 J**	314	206	**816**	**604**	**663**	**502**	160	**3,720**
Mercury	7439-97-6	**0.81**	mg/kg	**1.08**	0.438	**0.829**	<0.085 U	**3.63**	**0.831**	0.599	0.343	0.331
PFAS												
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.0011**	mg/kg	0.000628	0.000269 J	0.000241 J	0.000241 J	0.000482 J	0.000231 J	0.000283	0.000308	0.000328

Table 3
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results - Exceeding Track 4 SCOs

45 Commercial Street, Brooklyn, New York
NYSDEC BCP Site No.: C224304 | Langan Project No.: 170229024

Analyte	CAS Number	Track 4 Site-Specific SCOs	Location	EPSW02	EPSW05	EPSW06	EPSW07	EPSW08	EPSW09	EPSW10	EPSW11	EPSW12
			Sample Name	EPSW02_2	EPSW05_2	EPSW06_2	EPSW07_2	EPSW08_2	EPSW09_2	EPSW10_2	EPSW11_2	EPSW12_2
			Sample Date	10/04/2021	10/04/2021	10/04/2021	10/04/2021	11/18/2021	11/18/2021	11/18/2021	11/18/2021	11/09/2021
			Sample Depth	2	2	2	2	2	2	2	2	2
			Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds												
Benzo(a)anthracene	56-55-3	**1**	mg/kg	**3.7**	**4.3**	**1.3**	**5.6**	**1.5**	**1.3**	0.46 J	0.71	**3**
Benzo(a)pyrene	50-32-8	**1**	mg/kg	**3.2**	**3.8**	**1.1**	**5.3**	**1.2 J**	**1.1**	0.43 J	0.66 J	**2.3**
Benzo(b)fluoranthene	205-99-2	**1**	mg/kg	**4.4**	**5**	**1.4**	**6.4**	**1.6**	**1.3**	0.58	0.97	**3.3**
Benzo(k)fluoranthene	207-08-9	**3.9**	mg/kg	1.4	1.6	0.52	2.4	0.61 J	0.46 J	0.21 J	0.31 J	1
Chrysene	218-01-9	**3.9**	mg/kg	3.5	**4.2**	1.3	**5.2**	1.4	1.1	0.48 J	0.72	3
Dibenz(a,h)anthracene	53-70-3	**0.33**	mg/kg	**0.5**	**0.62**	0.2	**0.77**	<1 U	0.15 J	<0.55 U	0.12 J	**0.35 J**
Fluoranthene	206-44-0	**100**	mg/kg	6	6.3	2.7	7.9	3	2.8	1	1.4	6.9
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	mg/kg	**2.5**	**3**	**0.9**	**3.6**	**0.77 J**	**0.74**	0.37 J	**0.55 J**	**1.6**
Phenanthrene	85-01-8	**100**	mg/kg	4.7	4.8	2.1	5.3	2.3	2.2	0.76	0.93	5.4
Total SVOCs	SVOCs	**500**	mg/kg	42.139	47.367	17.337	59.495	18.8	16.36	7.39	9.84	38.64
Metals												
Arsenic	7440-38-2	**16**	mg/kg	7.77	15.7	9.25	11.8	7.8	5.94	12.1	6.24	6.89
Barium	7440-39-3	**400**	mg/kg	303	115	217	91.8	64.7	51.5	111	90.8	70.7
Copper	7440-50-8	**270**	mg/kg	46.9	71.3	59.5	69.1	52.2	33.5	100	187	114
Lead	7439-92-1	**400**	mg/kg	253	282	198	205	221	81.4	**422**	301	350
Mercury	7439-97-6	**0.81**	mg/kg	0.275	**1.22**	0.36	0.167	0.255	0.088	0.671	0.223	0.532
PFAS												
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.0011**	mg/kg	0.000072 J	0.000306	0.000336	0.000142 J	0.000838	<0.000254 U	**0.00202**	0.000174 J	0.000301 J

Table 3
Site Management Plan
Post-Excavation Documentation Soil Sample Analytical Results - Exceeding Track 4 SCOs

45 Commercial Street
Brooklyn, New York
NYSDEC BCP Site No.: C224304
Langan Project No.: 170229024

Notes:

CAS - Chemical Abstract Service
NS - No standard
mg/kg - milligram per kilogram
PFAS - per- and polyfluoroalkyl substances
PFOA - perfluorooctanoic acid
NA - Not analyzed
RL - Reporting limit
<RL - Not detected

Soil sample analytical results are compared to the Track 4 Site-Specific Soil Cleanup Objectives (SCO). The Track 4 Site-Specific SCOs include the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Restricted Use Restricted-Residential SCOs for VOCs, SVOCs, PCBs, pesticides, herbicides, and metals, and site-specific values for total SVOCs (500 mg/kg) and PFOA (0.0011 mg/kg).

Criterion comparisons for 3- & 4-methylphenol (m&p cresol) are provided for reference. Promulgated SCOs are for 3-methylphenol (m-cresol) and 4-methylphenol (p-cresol).

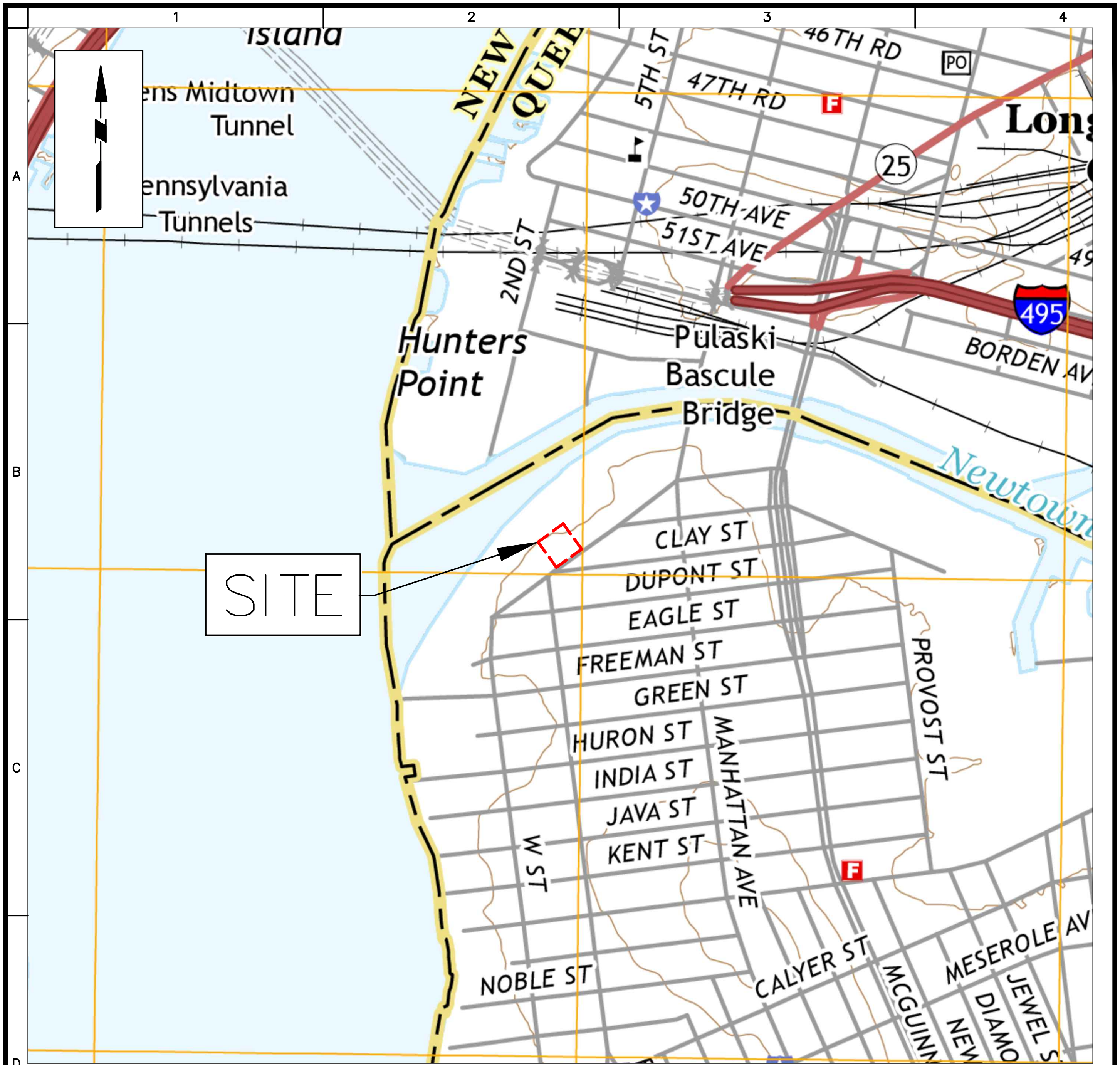
Qualifiers:

J - The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ - The analyte was not detected at a level greater than or equal to the RL; however, the reported RL is approximate and may be inaccurate or imprecise.
U - The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Exceedance Summary:

10 - Result exceeds Track 4 Site-Specific SCOs

FIGURES



NOTES

1. BASE MAP SOURCE: USGS (2016) 7.5-MINUTE BROOKLYN, N.Y., TOPOGRAPHIC QUADRANGLES
2. NORTH ARROW SHOWS TRUE NORTH.

LEGEND

APPROXIMATE SITE BOUNDARY

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

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21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

Project	Figure Title	Project No. 170229024	Figure No.
45 COMMERCIAL STREET BLOCK No. 2472, LOT No. 70 BROOKLYN KINGS COUNTY NEW YORK	SITE LOCATION MAP	Date 03/26/2020 Drawn By DC Checked By WK	1

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LEGEND:

APPROXIMATE SITE BOUNDARY

APPROXIMATE TAX LOT BOUNDARY

NOTES:

1. BASE MAP SOURCES: TOPOGRAPHIC BOUNDARY & UTILITY SURVEY DRAWING, DATED MAY 25, 2018, PREPARED BY LANGAN.
2. NORTH ARROW SHOWS TRUE NORTH.

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50 0 25 50

SCALE IN FEET

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Filename: \\langan.com\data\NYC\data0\170229024\Project Data\CAD\24\SheetFiles\Environmental\SMP\Figure 2 - Site Plan_051222.dwg Date: 10/11/2022 Time: 16:15 User: tgoodnough Style Table: Langan.stb Layout: ANSIB-BL

LEGEND:

APPROXIMATE SITE BOUNDARY

APPROXIMATE TAX LOT BOUNDARY

APPROXIMATE NEW BUILDING FOOTPRINT

EP01(DEPTH BGS) DOCUMENTATION SAMPLE LOCATION WITH NO ANALYTES EXCEEDING THE TRACK 4 SITE-SPECIFIC SCOs.

EP01(DEPTH BGS) DOCUMENTATION SAMPLE LOCATION WITH ONE OR MORE ANALYTES EXCEEDING THE TRACK 4 SITE-SPECIFIC SCOs.

NOTES:

1. BASE MAP SOURCES: TOPOGRAPHIC BOUNDARY & UTILITY SURVEY DRAWING, DATED MAY 25, 2018, PREPARED BY LANGAN.
2. NORTH ARROW SHOWS TRUE NORTH.
3. SCO = SOIL CLEANUP OBJECTIVE
4. BGS = BELOW GRADE SURFACE

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Project
45 COMMERCIAL STREET
BLOCK No. 2472, LOT No. 70
BROOKLYN
KINGS COUNTY NEW YORK

Figure Title
REMAINING SOIL CONTAMINATION MAP

Project No. 170229024
Date 05/25/2022
Drawn By TG
Checked By GW

Figure No. 3

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Filename: \\langan.com\data\NYC\data0\170229024\Project Data\CAD\24\SheetFiles\Environmental\SMP\Figure 3 - Remaining Soil Contamination Map.dwg Date: 10/11/2022 Time: 16:17 User: tgoodnough Style Table: Langan.stb Layout: ANSIB-BL

LEGEND:

APPROXIMATE SITE BOUNDARY

APPROXIMATE TAX LOT BOUNDARY

APPROXIMATE NEW BUILDING FOOTPRINT

AREA WHERE INSTITUTIONAL CONTROLS APPLY

NOTES:

1. BASE MAP SOURCES: TOPOGRAPHIC BOUNDARY & UTILITY SURVEY DRAWING, DATED MAY 25, 2018, PREPARED BY LANGAN.
2. NORTH ARROW SHOWS TRUE NORTH.

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50 0 25 50
SCALE IN FEET

LANGAN	Project	Figure Title	Project No. 170229024	Figure No.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	45 COMMERCIAL STREET BLOCK No. 2472, LOT No. 70 BROOKLYN KINGS COUNTY NEW YORK	INSTITUTIONAL CONTROLS LOCATION PLAN	Date 04/20/2022 Drawn By TG Checked By GW	4

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Filename: \\langan.com\data\NYC\data0\170229024\Project Data\CAD\24\SheetFiles\Environmental\SMP\Figure 4 - Institutional Controls Location Map.dwg Date: 10/14/2022 Time: 11:31 User: tgoodnough Style Table: Langan.stb Layout: ANSIB-BL

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE TAX LOT BOUNDARY
- APPROXIMATE NEW BUILDING FOOTPRINT
- SITE COVER SYSTEM
- ACTIVE SMD SYSTEM AND WATERPROOFING/VAPOR BARRIER BENEATH BUILDING SLAB.

NOTES:

1. BASE MAP SOURCES: TOPOGRAPHIC BOUNDARY & UTILITY SURVEY DRAWING, DATED MAY 25, 2018, PREPARED BY LANGAN.
2. NORTH ARROW SHOWS TRUE NORTH.
3. SUB-MEMBRANE DEPRESSURIZATION (SMD) SYSTEM AS-BUILT DRAWINGS AND DETAILS ARE INCLUDED IN APPENDIX H OF THE SITE MANAGEMENT PLAN.

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SCALE IN FEET

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Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	45 COMMERCIAL STREET BLOCK No. 2472, LOT No. 70 BROOKLYN KINGS COUNTY NEW YORK	ENGINEERING CONTROLS LOCATION PLAN	Date 04/20/2022; Drawn By TG; Checked By GW	5

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Filename: \\langan.com\data\NYC\data0\170229024\Project Data\CAD\24\SheetFiles\Environmental\SMP\Figure 5 - Engineering Controls Location Map.dwg Date: 10/14/2022 Time: 11:33 User: tgoodnough Style Table: Langan.stb Layout: ANSIB-BL

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE TAX LOT BOUNDARY
- APPROXIMATE AREA OF MINIMUM 12-INCH CONCRETE BUILDING SLAB
- APPROXIMATE AREA OF MINIMUM 2 FEET OF 0.75-INCH VIRGIN QUARRY STONE
- APPROXIMATE AREA OF MINIMUM 2-INCH CONCRETE SLAB

STATE OF NEW YORK
JASON JAMES HAYES
LICENSED PROFESSIONAL ENGINEER
089491

11/10/2022

NOTES:

1. BASE MAP SOURCES: TOPOGRAPHIC BOUNDARY & UTILITY SURVEY DRAWING, DATED MAY 25, 2018, PREPARED BY LANGAN.
2. NORTH ARROW SHOWS TRUE NORTH.

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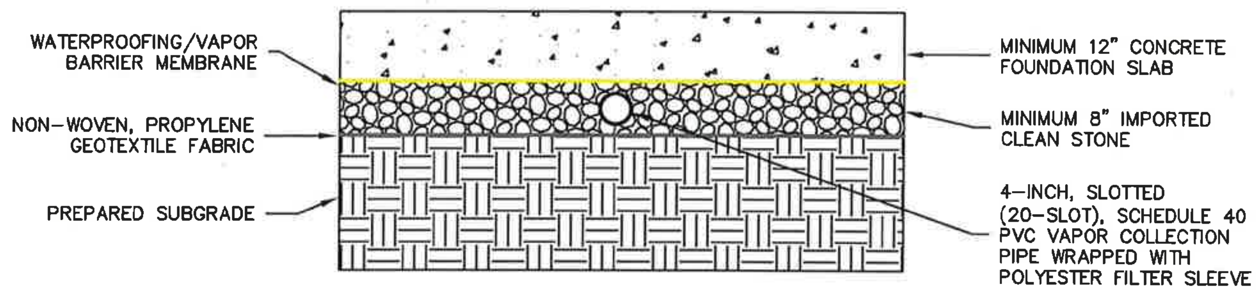
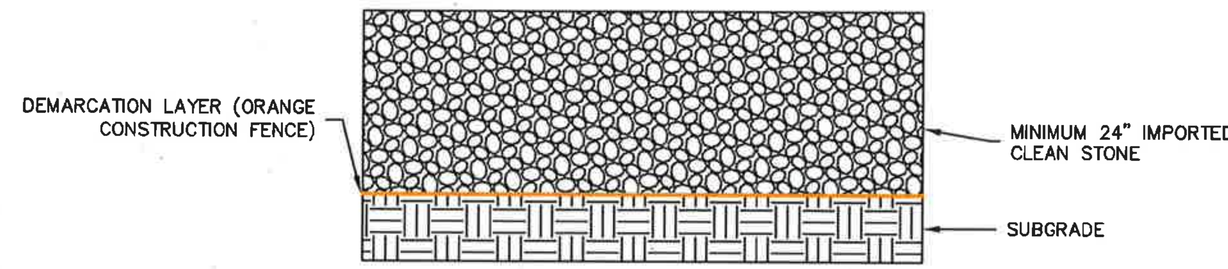
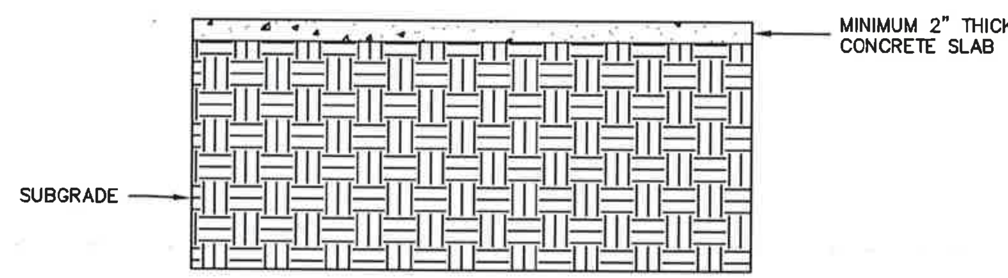
Filename: \\langan.com\data\NYC\data0\170229024\Project Data\CAD\24\SheetFiles\Environmental\SMP\Figure 6 - Site Cover System Layout_100622.dwg Date: 10/14/2022 Time: 11:28 User: tgoodnough Style Table: Langan.stb Layout: ANSIB-BL



DETAIL 1: TYPICAL BUILDING FOUNDATION SLAB COVER SYSTEM DETAIL
(NOT TO SCALE)



DETAIL 2: TYPICAL IMPORTED STONE COVER SYSTEM DETAIL IN NORTH, EAST, AND SOUTH COURTYARDS
(NOT TO SCALE)



DETAIL 3: TYPICAL CONCRETE SLAB COVER SYSTEM DETAIL IN NORTH AND SOUTH COURTYARDS
(NOT TO SCALE)

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Project	Figure Title	Project No. 170229024	Figure No.
45 COMMERCIAL STREET BLOCK No. 2472, LOT No. 70 BROOKLYN KINGS COUNTY NEW YORK	AS-BUILT COVER SYSTEM DETAILS	Date 07/26/2022 Drawn By TG Checked By GW	6B

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APPENDIX A

ENVIRONMENTAL EASEMENT

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument.The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.

2022101700966001002EB8F7

RECORDING AND ENDORSEMENT COVER PAGE

Document ID: 2022101700966001 Document Date: 10-04-2022 Preparation Date: 10-17-2022
Document Type: EASEMENT
Document Page Count: 11

PRESENTER:
CHICAGO TITLE INSURANCE COMPANY
711 THIRD AVE, 8TH FLOOR
CT22-80088-K (CES)
NEW YORK, NY 10017
212-880-1453
CTINYRECORDING@CTT.COM

RETURN TO:
SIVE PAGET & RIESEL PC
KEVIN A. ROGERS
560 LEXINGTON AVENUE
NEW YORK, NY 10022

PROPERTY DATA

Borough	Block	Lot	Unit	Address
BROOKLYN	2472	70 Entire Lot		35 COMMERCIAL STREET

Property Type: COMMERCIAL REAL ESTATE Easement

CROSS REFERENCE DATA

CRFN_______ *or* DocumentID________ *or* ________ Year_____ Reel____ Page_____ *or* File Number__________

PARTIES

GRANTOR/SELLER:
HP H1H2 HOUSING DEVELOPMENT FUND CO., INC
253 WEST 35TH ST., 3RD FL
NEW YORK, NY 10001

☒ Additional Parties Listed on Continuation Page

GRANTEE/BUYER:
PEOPLE OF NEW YORK BY DEPT. ENVIRONMENTAL CONSERVATION 625 BROADWAY
ALBANY, NY 12233

FEES AND TAXES

Mortgage :

Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	92.00
Affidavit Fee:	$	0.00

Filing Fee:	$	100.00
NYC Real Property Transfer Tax:	$	0.00
NYS Real Estate Transfer Tax:	$	0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 10-18-2022 15:40
City Register File No.(CRFN):
2022000396110

Annette M Hill

City Register Official Signature

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

2022101700966001002CBA77

RECORDING AND ENDORSEMENT COVER PAGE (CONTINUATION)

Document ID: 2022101700966001 Document Date: 10-04-2022 Preparation Date: 10-17-2022
Document Type: EASEMENT

PARTIES

GRANTOR/SELLER:
H1H2 OWNER LLC
535 MADISON AVENUE
NEW YORK, NY 10022

County: Kings Site No: C224304 Brownfield Cleanup Agreement Index : C224304-03-20, as amended by Amendment #1 on June 11, 2021, and Amendment #2 on July 18, 2022

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 4th day of October, 2022, between Owner(s), HP H1H2 Housing Development Fund Company, Inc., having an office at c/o NYC Partnership Housing Development Fund Company, Inc., 253 West 35th Street, 3rd Floor, New York, NY 10001 (the "Grantor Fee Owner"), and H1H2 Owner, LLC, a New York limited liability company, having an office at 535 Madison Avenue, 35th Floor, New York, NY 10022 (the "Grantor Beneficial Owner; and together with the Grantor Fee Owner, collectively, the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor Fee Owner, is the owner of the fee interest in the real property located at the address of 45 Commercial Street in the City of New York, County of Kings and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 2472 Lot 70, being the same as that property conveyed to Grantor Fee Owner by deed dated June 24, 2021 and recorded in the City Register of the City of New York on July 19, 2021 as CRFN # 2021000274881. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.02 +/- acres, and is hereinafter more fully described in the Land Title Survey dated June 1, 2021 prepared by Paul D. Fisher of Langan Engineering, Environmental, Surveying, Landscape Architecture and

Geology, D.P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, Grantor Beneficial Owner, is the owner of the beneficial interest in the Controlled Property being the same as a portion of that beneficial interest conveyed to Grantor Beneficial Owner by means of a Declaration of Interest and Nominee Agreement between Grantor Fee Owner and Grantor Beneficial Owner dated as of June 24, 2021 and recorded in City Register of the City of New York on July 19, 2021 as CRFN # 2021000274882; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C224304-03-20, as amended by Amendment #1 on June 11, 2021, and Amendment #2 on July 18, 2022, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway

Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C224304
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

11. Consistency with the SMP. To the extent there is any conflict or inconsistency between the terms of this Environmental Easement and the SMP, regarding matters specifically addressed

by the SMP, the terms of the SMP will control.

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IN WITNESS WHEREOF, Grantor Fee Owner has caused this instrument to be signed in its name.

HP H1H2 Housing Development Fund Company, Inc.:

By: Shelia Martin

Print Name: **SHELIA MARTIN**
VICE PRESIDENT

Title: Date: 8/30/2022

Grantor Fee Owner's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF NEW YORK)

On the 30th day of August, in the year 2022, before me, the undersigned, personally appeared Shelia Martin, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public – State of New York

THERESA A OMANSKY
Notary Public, State of New York
Reg. No. 02OM6427050
Qualified in Kings County
Commission Expires December 20, 2025

IN WITNESS WHEREOF, Grantor Beneficial Owner has caused this instrument to be signed in its name.

H1H2 Owner LLC:

By: ______________________

Print Name: MARIAN KLEIN

Title: Authorized Signatory Date: 9/1/22

Grantor Beneficial Owner's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF New York)

On the 1 day of September, in the year 20 22 before me, the undersigned, personally appeared MARIAN KLEIN, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

____
Notary Public – State of New York

LEE BABCOCK
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01BA6392698
Qualified in Bronx County
Commission Expires June 3, 2023

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: Andrew Guglielmi
Andrew O. Guglielmi, Director
Division of Environmental Remediation

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Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 4th day of October, in the year 2022 before me, the undersigned, personally appeared Andrew O. Guglielmi, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Jennifer Andaloro
Notary Public - State of New York

JENNIFER ANDALORO
Notary Public, State of New York
No. 02AN6098246
Qualified in Albany County
Commission Expires January 14, 2024

SCHEDULE "A" PROPERTY DESCRIPTION

All that certain plot, piece, or parcel of land, situate, lying, and being in the Borough of Brooklyn, Kings County, City and State of New York, bounded and described as follows:

BEGINNING AT A POINT ON THE NORTHERLY SIDE OF COMMERCIAL STREET (MAPPED 70 FEET WIDE), DISTANT 663.25 FEET (COMPUTED) WESTERLY FROM THE INTERSECTION OF SAID NORTHERLY SIDE OF COMMERCIAL STREET WITH THE WESTERLY SIDE OF MANHATTAN AVENUE, SAID POINT BEING THE POINT OR PLACE OF BEGINNING; THENCE

WESTERLY, ALONG SAID NORTHERLY SIDE OF COMMERCIAL STREET, A DISTANCE OF 210.78 FEET TO A POINT; THENCE

NORTHWESTERLY, FORMING AN INTERIOR ANGLE OF 90° WITH THE PREVIOUS COURSE, A DISTANCE OF 211.59 FEET TO A POINT; THENCE

NORTHEASTERLY, FORMING AN INTERIOR ANGLE OF 90° WITH THE PREVIOUS COURSE, A DISTANCE OF 210.78 FEET TO A POINT; THENCE

SOUTHEASTERLY, FORMING AN INTERIOR ANGLE OF 90° WITH THE PREVIOUS COURSE, A DISTANCE OF 211.59 FEET TO A POINT, SAID POINT BEING THE POINT OR PLACE OF BEGINNING.

ENCOMPASSING AN AREA OF 44,599 SQUARE FEET OR 1.02 ACRES, MORE OR LESS.

APPENDIX B

LIST OF SITE CONTACTS

APPENDIX B - LIST OF SITE CONTACTS

45 COMMERCIAL STREET, BROOKLYN, NEW YORK
BROWNFIELD CLEANUP PROGRAM SITE NO. C224304

Key contacts for this project are as follows:

Site Owner and Remedial Party:	Owner: H1H2 OWNER LLC (Beneficial Owner) Representatives: Anne Carson Blair / Guy Morton Telephones: (212) 310-9768 / (212) 310-9765 E-mails: acarsonblair@parktowergroup.com / gmorton@parktowergroup.com
	Owner: HP H1H2 Housing Development Fund Company, Inc. (Fee Owner) Representative: Crystal Kay Telephone: (646) 217-3390 E-mail: ckay@housingpartnership.com
Remedial Party's Consultant:	Langan Engineering Program Manager Ms. Mimi Raygorodetsky Telephone: (212) 479-5441 E-mail: mraygorodetsky@langan.com
	Langan Engineering Project Manager Mr. Gregory Wyka, P.G., LEED AP ND Telephone: (212) 479-5476 E-mail: gwyka@langan.com
	Langan Engineering Health & Safety Officer Mr. Tony Moffa Telephone: (215) 756-2523 E-mail: tmoffa@langan.com
	Langan Engineering Field Safety Officer Mr. William Bohrer, PG Telephone: (212) 479-5533 E-mail: wbohrer@langan.com
Qualified Environmental Professional:	Langan Engineering Program Manager Mr. Michael Burke, PG, CHMM Telephone: (212) 479-5413 E-mail: mburke@langan.com

NYSDEC:	NYSDEC Regional Remediation Engineer Mr. Douglas MacNeal Telephone: (518) 402-9684 E-mail: douglas.macneal@dec.ny.gov
	NYSDEC Project Manager Ms. Ruth Curley Telephone: (518) 402-9480 E-mail: ruth.curley@dec.ny.gov
	NYSDEC Site Control Ms. Kelly Lewandowski Telephone: (518) 402-9569 E-mail: kelly.lewandowski@dec.ny.gov
NYSDOH:	NYSDOH Project Manager Mr. Eamonn O'Neil Telephone: (518) 402-7877 Email: eamonn.oneil@health.ny.gov
Remedial Party's Attorney:	Sive, Paget & Riesel P.C. Ms. Christine Leas Telephone: (646) 378-7267 E-mail: cleas@sprlaw.com

APPENDIX C

EXCAVATION WORK PLAN

APPENDIX C – EXCAVATION WORK PLAN (EWP)

C-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH). Table C-1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

Table C-1: Notifications*

NYSDEC Regional Remediation Engineer	Douglas MacNeal Telephone: (518) 402-9684 Email: douglas.macneal@dec.ny.gov
NYSDEC Project Manager	Ruth Curley Telephone: (518) 402-9480 Email: ruth.curley@dec.ny.gov
NYSDEC Site Control	Kelly Lewandowski Telephone: (518) 402-9569 Email: kelly.lewandowski@dec.ny.gov
NYSDOH Project Manager	Eamonn O'Neil Telephone: 518-402-7877 Email: eamonn.oneil@health.ny.gov
Program Manager	Mimi Raygorodetsky Telephone: (212) 479-5441 Email: mraygorodetsky@langan.com
Project Manager	Gregory Wyka, P.G., LEED AP ND Telephone: (212) 479-5476 Email: gwyka@langan.com
Owner Representatives	Anne Carson Blair / Guy Morton Telephones: (212) 310-9768 / (212) 310-9765 Emails: acarsonblair@parktowergroup.com / gmorton@parktowergroup.com

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;

- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and Title 29 of the Code of Federal Regulations (CFR) Part 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP appended to this Site Management Plan (SMP);
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

The NYSDEC project manager will review the notification and may request additional requirements for the excavation that are not listed in this EWP

C-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector [PID]) soil screening will be performed by a qualified environmental professional (QEP) during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work.

Excavated soil/fill will be segregated based on previous environmental data and screening results into two classes - material that requires off-site disposal and material intended to be reused on-site. Soil/fill proposed for reuse must be sampled accordance with NYSDEC Program Policy DER-10: Technical Guide for Site Investigation and Remediation (DER-10) Table 5.4(e) to determine if it can be reused on-site (either as backfill or cover soil) and must be approved by the NYSDEC prior to reuse. Previously imported soil/fill may be reused without additional testing, provided it has not been comingled with soil/fill that has not been tested for reuse.

Further discussion of off-site disposal of materials and on-site reuse is provided in Sections C-6 and C-7 of this EWP.

C-3 SOIL STAGING METHODS

Stockpiles will be placed on and kept covered at all times with adequately anchored tarps or plastic sheeting. Stockpiles will be routinely inspected and damaged tarp covers or plastic sheeting will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook, maintained at the site, and made available for inspection by the NYSDEC.

Soil may also be stored in United Nations/Department of Transportation (UN/DOT)-approved 55-gallon drums.

C-4 MATERIALS EXCAVATION AND LOAD-OUT

A QEP or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this EWP.

The presence of utilities and easements on the site will be investigated by the QEP and/or contractor. It will be determined whether a risk or impediment to the planned work under this EWP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The QEP will be responsible for documenting outbound trucks are washed/cleaned at the truck wash before leaving the site until the work activities are complete. Locations where vehicles enter or exit the site will be inspected daily for evidence of off-site sediment tracking. The QEP or field staff under their supervision will be responsible for documenting that egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

C-5 MATERIALS TRANSPORT OFF-SITE

Transport of materials will be performed by licensed haulers in accordance with appropriate local, state and federal regulations, including 6 New York Codes, Rules and Regulations (NYCRR) Part 364. Haulers will be appropriately licensed and trucks properly placarded. Trucks will enter and exit the site using dedicated ingress/egress points. Trucks loaded with site materials will exit the vicinity of the site using only approved truck routes. Trucks will be prohibited from stopping and idling in the neighborhood outside the site. To the extent possible, queuing of trucks will be performed on site in order to minimize off-site disturbance. Off-site queuing will be minimized.

Truck routes will take into account:

- Limiting transport through residential areas and past sensitive sites;
- Use of city mapped truck routes;
- Prohibiting off-site queuing of trucks entering the facility to the extent possible;
- Limiting total distance to major highways;
- Promoting safety in access to highways;
- Overall safety in transport; and
- Community input (where necessary).

C-6 MATERIALS DISPOSAL OFF-SITE

Soil/fill excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed of in accordance with all local, state (including 6 NYCRR Part 360), and federal regulations, unless it has been sampled for reuse and meets the site's analytical reuse requirements (i.e. lower of NYCRR Part 375-6.7(d) Protection of Groundwater [PGW] and Restricted Use Restricted-Residential [RR] Soil Cleanup Objectives [SCO]). If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

The following documentation will be obtained and reported by the QEP for each off-site disposal location used to fully demonstrate and document that the disposal of material derived from the site conforms to applicable laws:

1) A letter from the QEP or BCP Volunteer to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation site in New York State. The letter will provide the project identity and the name and phone number of the QEP. The letter will include as an attachment a summary of chemical data for the material being transported (including site characterization data); and

2) A letter from each receiving facility stating it is in receipt of the correspondence (above) and is approved to accept the material.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility, if appropriate, (e.g., hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, concrete and demolition [C&D] recycling facility). Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report (PRR). This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet the 6 NYCRR Part 375 Unrestricted SCO is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility).

C-7 MATERIALS REUSE ON-SITE

The reuse of on-site materials must follow the procedures included in this EWP so that unacceptable material is not reused on-site. Grossly-contaminated soil, historic fill, or soil with petroleum staining or odor will not be reused on-site in any circumstance. Soil intended for reuse on-site will be sampled in accordance with DER-10 Table 5.4(e) and approved by the NYSDEC prior to reuse. Soil acceptable for reuse (i.e., below any demarcation layers or impervious surfaces, as backfill for subsurface utility lines, or as cover soil) must be of natural origin, non-hazardous and meet the lower of the 6 NYCRR Part 375-6.8(b) RR SCOs, PGW SCOs and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances guidance values [January 2021].

Demolition debris proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance, as appropriate. On-site, mechanical processing of historic fill, contaminated soil, and construction and demolition debris is prohibited unless otherwise approved by the NYSDEC. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

C-8 FLUIDS MANAGEMENT

Liquids to be removed from the site, including any dewatering fluids, will be handled, transported and disposed of in accordance with applicable local, state and federal regulations. Discharges to the New York City sewer system must be approved by the New York City Department of Environmental Protection (NYCDEP).

Dewatering may be conducted via a sump or well-point system. Dewatering fluids will either be containerized for off-site disposal or discharged to a New York City sewer system in accordance with a NYCDEP permit, but will not be recharged back to the land surface or subsurface of the site without a Non-Jurisdictional Determination or State Pollutant Discharge Elimination System (SPDES) permit.

C-9 COVER SYSTEM RESTORATION

After completion of soil removal and any other invasive work, the cover system will be restored in a manner that complies with the SMP. The composite cover system consists of a minimum 12-inch-thick concrete slab in the footprint of the building, asphalt- or concrete-paved areas, and a minimum of 2 feet of virgin quarry stone or soil meeting the lower of NYCRR Part 375-6.7(d) PGW and RR SCO. A demarcation layer, consisting of orange snow fencing (or approved equivalent), will be placed to provide a visual reference to the top of the remaining contamination zone (i.e., the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP). If the type of cover system changes from that which exists prior to excavation (e.g., concrete cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent PRR and in an updated SMP.

C-10 BACKFILL FROM OFF-SITE SOURCES

Materials proposed for import to the site will be approved by the QEP and will be in compliance with provisions in this SMP before they are shipped to the site. Imported backfill will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) or other acceptable fill material such as virgin, native stone from a quarry or recycled concrete aggregate (RCA). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by the NYSDEC. Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the site. Solid waste will not be imported onto the site.

A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Composite samples (with the exception of VOC) of imported soil/fill will be taken at a frequency in accordance with DER-10 Table 5.4(e)(10), or at a lesser frequency negotiated with the NYSDEC Project Manager, depending on the proposed source material. The samples would be analyzed for Target Compound List/Target Analyte List (TCL/TAL) VOCs, SVOCs, metals, pesticides, PCBs, metals/inorganics, PFAS (21-compound list) and 1,4-dioxane, including all compounds listed in Table 375-6.8 of 6 NYCRR Part 375, by a NYSDOH ELAP-certified laboratory. Once it is determined that the fill material meets backfill and cover soil quality SCOs, the material will be loaded onto trucks with secure covers for delivery.

RCA can be imported from facilities permitted or registered by the NYSDEC provided the NYSDEC Project Manager issues a case-specific beneficial use determination (BUD), if necessary. A PE/QEP will certify that the facilities have 6 NYCRR Part 360 registration and permitting for the period of acquisition of RCA. RCA imported from compliant facilities and virgin gravel, rock or stone from mines, quarries or facilities permitted or registered by the NYSDEC or the applicable state of origin and have no more than 10% by weight passing through a No. 80 sieve will not require additional testing unless required by NYSDEC under its terms for operation of the facility. Additional exemptions from testing requirements may be approved by the NYSDEC Project Manager based on their review of requests by the QEP. RCA imported to the site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

Trucks entering the site with imported soil will be securely covered with tight fitting covers.

C-11 STORMWATER POLLUTION PREVENTION

Silt fencing or hay bales will be installed around the perimeter of the construction area, as required. Barriers and hay bale checks will be installed and inspected once a week and after every storm event; necessary repairs shall be made immediately. Results of inspections will be recorded in a logbook maintained at the site and available for inspection by the NYSDEC. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fence damaged due to weathering. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

C-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations and/or development-related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product and surrounding soils, as necessary, to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (Target Analyte List [TAL] metals; Target Compound List [TCL] volatile organic compounds [VOC] and semivolatile organic compounds [SVOC], TCL pesticides, and polychlorinated biphenyls [PCB]), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to the NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the PRR.

C-13 COMMUNITY AIR MONITORING PLAN

Community air monitoring will be conducted in compliance with the NYSDOH Generic CAMP outlined below. Special consideration will be given to implementing planned activities when potentially exposed population occupancy is at a minimum, and when necessary, the use of engineering controls such as vapor/dust barriers or special ventilation devices will be considered.

The CAMP includes real-time monitoring for VOCs and particulates at the downwind perimeter of each designated work area when certain activities are in progress. CAMP stations will be relocated, to the extent practical, based on prevailing wind directions observed at the site during soil intrusive activities. Continuous monitoring is required for all ground intrusive activities, soil handling activities and during demolition of contaminated or potentially contaminated structures. Periodic monitoring for VOCs is required during non-intrusive activities such as the collection of soil samples. Periodic monitoring during sample collection will likely consist of taking a reading upon arrival at a sample location, monitoring while overturning soil, and taking a reading before leaving a sample location.

CAMP monitoring for VOC levels will be conducted with PIDs, and monitoring for dust/particulates will be conducted with particulate sensors equipped with filters to detect particulates less than 10 microns in diameter (PM10). Monitoring for particulates and odors will be conducted during all ground intrusive activities by the Langan field personnel. The work zone is defined as the general area in which machinery is operating in support of intrusive activities. A portable PID will be used to monitor the work zone and for periodic monitoring of VOCs during activities such as soil and groundwater sampling. The site perimeter will be visually monitored for fugitive dust emissions.

The following actions will be taken based on VOC levels measured:

- If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total VOC levels at the downwind perimeter of the work zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the work 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 above background for the 15-minute average.

- If the total VOC level is above 25 ppm at the perimeter of the work zone, activities will be halted, the source of vapors identified, corrective actions taken to abate emissions and monitoring continued. Additional personal protective equipment (PPE) may be required.
- If total VOC concentrations near the outside walls of occupied structures or next to intake vents exceeds 1 ppm, monitoring will occur within the occupied structure.

The following actions will be taken based on visual dust observations or PM10 measurements:

- If the downwind particulate level is 100 µg/m³ greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work zone then additional dust suppression measures must be employed. Work may continue with additional dust suppression techniques provided that downwind PM10 levels do not exceed 150 µg/m³ above the background level and provided that no visible dust is migrating from the work zone.
- If, after implementation of dust suppression techniques, downwind PM10 levels are greater than 150 µg/m³ above the background 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 PM10 concentration to within 150 µg/m³ of the upwind level and in preventing visible dust migration.
- If total particulate concentrations near the outside walls of occupied structures or next to intake vents exceed 150 µg/m³, work activities will be suspended until controls are implemented.

Locations of the CAMP stations will be adjusted based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP and any corrective measures taken, will be reported to the NYSDEC and NYSDOH Project Managers within 24 hours and CAMP data will be provided on a weekly basis.

C-14 ODOR CONTROL PLAN

Work practices to minimize odors and vapors will be used during intrusive activities. Odor and organic vapor controls may include the application of foam suppressants or tarps over the odorous material or VOC source areas. Foam suppressants may include biodegradable foams applied over the odorous material for short-term control of the odor and VOCs.

If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until relevant nuisance odors are abated. NYSDEC and NYSDOH will be notified of odor events and of any other complaints about the project. Implementation of odor controls, including the halt of work, will be the responsibility of the Program Manager. Application of odor controls is the responsibility of the contractor. Any odor control measures that are implemented will be summarized in the PRR.

Necessary means will be employed to prevent on- and off-site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils, where other methods prove ineffective. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (a) direct load-out of soils to trucks for off-site disposal; (b) use of chemical odorants in spray or misting systems; and (c) use of staff to monitor odors in surrounding neighborhoods.

Although not anticipated, where odor nuisances develop during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided because of on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

C-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water source for road wetting. The water source will be equipped with a water cannon capable of spraying water directly onto all site areas including excavations and stockpiles.
- Gravel will be used on roadways to provide a clean and dust-free road surface, as necessary.
- If required, on-site roads will be limited in total area to minimize the area required for water source sprinkling.

C-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during all site excavation work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX D

OWNER AND REMEDIAL PARTY RESPONSIBILITIES

OWNER AND REMEDIAL PARTY RESPONSIBILITIES

Responsibilities

The responsibilities for implementing the Site Management Plan (SMP) for the 45 Commercial Street, Brooklyn site (the "site"), Brownfield Cleanup Program (BCP) Site No. C224304, are on the site owner and Remedial Party, currently listed as:

GPL Development LLC; H Owner LLC; Greenpoint Landing Developers LLC; Greenpoint Storage Terminal LLC; Greenpoint Landing Associates, L.L.C.; H1H2 Owner LLC (Beneficial Owner); H1H2 GPL Owner LLC; H1H2 Retail LLC; and HP H1H2 Housing Development Fund Company, Inc. (Fee Owner)
535 Madison Avenue
New York, New York 10022

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party (RP) refers to any of the following: Certificate of Completion holder, volunteer, applicant, responsible party, and, in the event the New York State Department of Environmental Conservation (NYSDEC) is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf.

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the site.

Site Owner and Remedial Party's Responsibilities:

1) The owner and RP shall follow the provisions of the SMP as they relate to future construction and excavation at the site.

2) In accordance with a periodic time frame determined by the NYSDEC, the owner, and RP shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The owner and RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updates to the SMP.

3) The owner and RP will grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

4) The owner and RP are responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the site's RP and the NYSDEC in accordance with the timeframes indicated in Section 1.3 of this SMP.

5) In the event some action or inaction by the owner and RP adversely impacts the site, the owner and RP must notify the NYSDEC in accordance with the time frame indicated in Section 1.3 of this SMP and (ii) coordinate performance of necessary corrective actions with the RP.

6) The owner and RP must notify the NYSDEC of any change in ownership of the site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the site property. Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 375 contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: 60 days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's (DER) Site Control Section. Notification requirements for a change in use are detailed in Section 1.3 of this SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

7) Before accessing the site property to undertake a specific activity, the owner and RP shall provide advance notification that shall include an explanation of the work expected to be completed. The owner and RP shall provide to (i) the NYSDEC, and (ii) other entities, if required by the SMP, a copy of any analytical data generated during the site visit and/or any final report produced.

8) If the NYSDEC determines that an update of the SMP is necessary, the owner and RP shall update the SMP and obtain final approval from the NYSDEC.

9) The owner and RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3 - Notifications of the SMP.

10) Prior to a change in use that impacts the responsibilities for implementing the SMP, the owner and RP shall submit to the NYSDEC for approval of an amended SMP.

11) Until such time as the NYSDEC deems the SMD system unnecessary, the owner shall operate the system, pay for the utilities for the system's operation, and report any maintenance issues to the RP and the NYSDEC.

12) In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data, that is produced with respect to structures and that exceeds New York State Department of Health (NYSDOH) or Occupational Safety and Health Administration (OSHA) guidelines on the site, whether produced by the NYSDEC, RP, or owner, to the tenants of the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law (ECL) Article 27, Title 24.

13) Any change in use, change in ownership, change in site classification (e.g., delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The owner and RP shall contact the Department to discuss the need to update such documents.

14) Change in RP/site ownership does not affect the owner and RP's obligations with respect to the site unless a legally binding document executed by the NYSDEC releases the owner and RP of its obligations.

15) Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

APPENDIX E

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

For

45 COMMERCIAL STREET
BROOKLYN, NEW YORK
NYSDEC BCP Site No.: C224304

Prepared for:

GPL Development LLC
535 Madison Avenue
New York, NY 10022

Prepared by:

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
21 Penn Plaza
360 West 31st Street, 8th Floor
New York, New York 10001

November 2022
Langan Project No. 170229024

LANGAN

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* Items to be posted prominently on site, or made readily available to personnel.

1.0 INTRODUCTION

1.1 General

This HEALTH AND SAFETY PLAN (HASP) was developed to address disturbance of known and reasonably anticipated subsurface contaminants and comply with Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.120(b) (4), *Hazardous Waste Operations and Emergency Response* during anticipated site work located at at 45 Commercial Street in Brooklyn, New York (Brooklyn Borough Tax Map Block 2472, Lot 70) ("the site"). This HASP provides the minimum requirements for implementing site operations during environmental investigation activities. All contractors performing work on this site shall implement their own Health and Safety Plans that, at a minimum, adhere to this HASP. The contractor is solely responsible for their own health and safety and that of their subcontractors. Langan personnel will implement this HASP while on-site.

The management of the day-to-day site activities and implementation of this HASP in the field is the responsibility of the site Langan Field Team Leader (FTL). Assistance in the implementation of this HASP can also be obtained from the site Langan Health and Safety Officer (HSO) and the Langan Health and Safety Manager (HSM). Contractors operating on the Site shall designate their own FTL, HSO and HSM. The content of this HASP may change or undergo revision based upon additional information made available to health and safety personnel, monitoring results, or changes in the work plan.

1.2 Site Location and Background

The site is located at 45 Commercial Street in the Greenpoint neighborhood of Brooklyn, New York and is identified as Block 2472, Lot 70 on the Borough of Brooklyn Tax Map.and encompasses an area of about 44,600 square feet. The site is bound by an active construction site, Parcel H3 (Block 2472, Lots 200 and 475) to the north, an active NYC transit authority parking lot to the east (Block 2472, Lot 425), Commercial Street to the south, and a new 37-story mixed used residential and commercial building with associated site improvements, Parcel G1 (Block 2472, Lots 80, 90, and 100) to the west. A site location plan is presented as Figure 1.

The proposed redevelopment project includes the removal of contaminated soil/fill and construction of one mixed-use residential and commercial building with 374 residential units (100% affordable housing for families earning under 90% of the annual median income) and ground floor retail. The building will comprise a 6-story podium (no cellar) with a 22-story tower set back from Commercial Street. The building footprint is about 32,000 square feet in area and the remainder of the tax lot (12,600 square feet) will be open space with a mixture of hardscape and landscaped areas. Design development plans are included as Appendix A.

The site will be excavated for remedial purposes to elevation (el.) 11 feet (ft) to 5 ft in the building footprint, to el. 7 ft in hotspots, and to el. 11 ft across the rest of the site. Excavated areas will be backfilled with clean fill material (meeting the lower of PGW and Restricted Use Restricted – Residential [RR] Soil Cleanup Objectives [SCOs]) as part of a composite cover system (with sub-membrane depressurization system that includes a vapor barrier). Through these means and the elements further described herein, the intended future use will be protective of human health and the environment.

Historical maps from the mid to late 1800s show the original shoreline of Newtown Creek was at about the same location as present-day Commercial Street indicating the site lies entirely on reclaimed land, a result of historical filling activities.

Coal and lumber storage were the primary uses of the site for more than 100 years from the late 1800s until about 1980, when the lumber yard operations were phased out and the owner (Lumber Exchange Terminal, Inc.) began to lease portions of the site to tenants for heavy construction equipment, materials, and machinery storage.

1.3 Summary of Work Tasks

1.3.1 Excavation Observation and Screening

As part of the excavation activities, Langan personnel will observe soil and bedrock excavation. Langan will screen excavated spoil material for visual, olfactory, and instrumental indicators suggestive of a potential chemical or petroleum release. Instrument screening for the presence of volatile organic compounds (VOCs) may be performed with a duly calibrated photoionization detector (PID). Contractors will excavate for utilities, foundation components and potential grading using heavy equipment and hand tools. Contractors will notify Langan personnel if they identify indications suggestive of a potential chemical or petroleum release.

Langan will coordinate trucking in cooperation with the soil disposal contractors. Langan will only sign non-hazardous manifests if instructed by the project manager (PM) and provide the specific language. Langan is not to sign hazardous waste manifests. Langan will record the information associated with each manifest as specified in the work plan. Contaminated material shall be handled and property disposed in accordance with federal, state and city regulations, criteria and guidelines.

1.3.2 Soil Screening & Reporting

As part of excavation activities, the Langan personnel will report when they have observed visual and olfactory indications of possible soil impact. Langan personnel will also report concentrations of VOCs above background when using a properly calibrated hand held PID, or equivalent.

1.3.3 Soil Sampling

As part of the excavation activities, soil samples (waste characterization, excavation endpoint, delineation, or quality assurance/quality control [QA/QC]) may be collected during construction, as required. Langan personnel will coordinate with the contractor in sampling soil (in accordance with the work plan, where applicable). If stockpile soil sampling is required from above ground level, suitable excavation equipment (i.e., excavator, front end loader) should be used to collect the sample.

Soil samples excavation endpoint or delineation sampling (along with QA/QC samples) may be collected and subsequently submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory in accordance with work plan specifications.

1.3.4 Stockpiling

Potentially impacted soil may be stockpiled pending laboratory analysis and determining proper off-site disposal. Visibly contaminated soil, if encountered, shall be segregated and stockpiled on at least 10 millimeters of plastic sheeting; reusable soil and fill shall be segregated and stockpiled separately from unusable fill, concrete and other debris; the stockpiles shall be kept covered with 6 millimeters thick plastic sheeting; the plastic sheeting covering the stockpiles shall be anchored firmly in place by weights, stakes, or both; the Contractor shall maintain the plastic sheeting.

1.3.5 Characterization of Excavated Material

When required by the SMP or work plan, Langan personnel will characterize excavated soil or clean backfill in accordance with Langan standards.

1.3.6 Excavation Backfill

Areas of the site that were over-excavated may be backfilled to development grade (i.e., the grade required to complete construction of the foundation and sidewalk extension). Imported material should meet specifications defined in the work plan or consist of clean fill that meets the 6 New York Codes, Rules and Regulations (NYCRR) Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives (UU SCOs) or other acceptable fill material such as virgin stone from a permitted mine or quarry or recycled concrete aggregate (RCA), from a New York State Department of Environmental Conservation (NYSDEC)-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. Imported RCA must be derived from recognizable and uncontaminated concrete.

1.3.7 Decommissioning and Removal of Underground Storage Tank

If an underground storage tank (UST) is encountered, a UST decommissioning and removal contractor shall furnish all labor and materials, equipment and incidentals required for the proper decontamination, removal and closure of any UST in accordance with federal, state and local regulations. Langan personnel will monitor VOCs with a calibrated PID downwind from the UST excavation and record the PID readings.

1.3.8 Construction Dewatering

Construction dewatering may be required, the dewatering contractor shall be responsible for handling contaminated dewatering fluids in accordance with federal, state and local regulations. Dewatering fluids are likely to be discharged to the local sanitary sewer system after treatment and under approved regulatory permit. Alternatively, the contractor may provide containerized storage to allow for testing of groundwater prior to, and after, treatment and before disposal. If required, Langan field personnel may sample dewatering treatment system liquids from either a discharge standpipe or a storage tank. Dewatering samples will be submitted to an ELAP-certified laboratory for analysis.

1.3.9 Construction Activity Inspections and Observations

Langan will observe construction activities including the composite cover performed by the contractor in accordance with the construction documents, RAWP, and special inspection requirements administered by the New York City Department of Buildings. Materials used for construction will be inspected by Langan for conformance to the design documents.

1.3.10 Hot Spot Delineation

Langan may retain a drilling contractor to advance soil borings to a depth bgs specified in the work plan. Borings locations will be based on the results of site inspection and document review. The drilling contractor will contact the appropriate utility mark-out authority and make available to their drilling staff the verification number and effective dates. The borings may be filled with clean soil cuttings after samples are collected.

Langan will screen soil for visual, olfactory, and instrumental indicators suggestive of a potential petroleum release. Instrument screening for the presence of VOCs may be performed with a PID. Langan will collect soil samples as specified in the lead delineation portion of the work plan. Soil samples will be submitted to a NYSDOH ELAP-certified laboratory and analyzed in accordance with work plan specifications.

1.3.11 Hot Spot Soil Excavation and Disposal

If required, Langan personnel will observe activities associated with the excavation and disposal of hazardous hot spot impacted soil. Langan personnel will coordinate with the excavator contractor so that the boundaries of the hazardous hot spot excavation correspond to with the approved disposal facilities instructions. Langan personnel are not to sign the hazardous waste manifests unless instructed by the Project Manager.

1.3.12 Equipment Decontamination

Before the start of the day's sampling and after sampling each run, sampling equipment will be decontaminated by the decontamination process outlined Attachment B - Decontamination Procedures. Decontamination wastes and purge water will be temporarily stored on site pending analytical results.

1.3.13 Management of Investigative-Derived Waste

The investigative-derived waste (IDW) generated during this investigation may stockpiled as defined under the stockpile section (above) or contained in DOT-approved 55-gallon drums. The drums will be temporarily stored on the site or as directed by the client representative. All drums will be filled between to two-thirds full to allow easy maneuvering during drum pickup and disposal. Drum labels are to be provided by Langan (Environmental Closet). All drums will be labeled as "IDW Pending Analysis" until sample data are reported from the laboratory. Drum labels will include date filled and locations where waste was generated along with the standard information required by the labels in accordance with the Langan SOP09, Drum Labeling..

Closed top drums are to be used to store liquids. Debris, including plastic sheeting, polyethylene tubing, personal protection equipment (PPE), decontamination debris, etc. will be segregated from and disposed in large heavy duty garbage bags and disposed of at the site. Excess unused glassware should be returned to the lab along with the last day of collection samples.

1.3.14 Drum Sampling

Excess or impacted soil and water that is drummed during the remedial action activities must be labeled in accordance with the Langan Drum Labeling Standard Operating Procedure (SOP-#9). Langan personnel will collect drum samples, as required, prior to off-site drum disposal. Samples will be placed into laboratory-supplied batch-certified clean glassware and submitted to a NYSDOH ELAP-certified laboratory.

2.0 IDENTIFICATION OF KEY PERSONNEL/HEALTH AND SAFETY PERSONNEL

The following briefly describes the health and safety (H&S) designations and general responsibilities that may be employed for this site. The titles have been established to accommodate the project needs and requirements and ensure the safe conduct of site activities. The H&S personnel requirements for a given work location are based upon the proposed site activities.

2.1 Langan Project Manager

The Langan Environmental PM is Greg Wyka. His responsibilities include:

- Ensuring that this HASP is developed, current, and approved prior to on-site activities.
- Ensuring that all the tasks in the project are performed in a manner consistent with Langan's comprehensive *Health and Safety Program for Hazardous Waste Operations* and this HASP.

2.2 Langan Corporate Health and Safety Manager

The Langan Corporate Health and Safety Manager (HSM) is Tony Moffa. His responsibilities include:

- Updating the *Health and Safety Program for Hazardous Waste Operations*.
- Assisting the site Health and Safety Officer (HSO) with development of the HASP, updating HASP as dictated by changing conditions, jobsite inspection results, etc. and approving changes to this HASP.
- Assisting the HSO in the implementation of this HASP and conducting Jobsite Safety Inspections and assisting with communication of results and correction of shortcomings found.
- Maintaining records on personnel (medical evaluation results, training and certifications, accident investigation results, etc.).

2.3 Langan Site Health & Safety Officer

The Langan site HSO is William Bohrer. His responsibilities include:

- Participating in the development and implementation of this HASP.
- When on-site, assisting the Langan Field Team Leader in conducting Tailgate Safety Meetings and Jobsite Safety Inspections and correcting any shortcomings in a timely manner.
- Ensuring that proper PPE is available, worn by employees, and properly stored and maintained.
- Controlling entry into and exit from the site contaminated areas or zones.
- Monitoring employees for signs of stress, such as heat stress, fatigue, and cold exposure.
- Monitoring site hazards and conditions.

- Knowing (and ensuring that all site personnel also know) emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.
- Resolving conflicts that may arise concerning safety requirements and working conditions.
- Reporting all incidents, injuries and near misses to the Langan Incident/Injury Hotline immediately and the client representative.

2.4 Langan Field Team Leader Responsibilities

The Langan Field Team Leader (FTL) is to be determined prior to the start of the start of field activities. The Field Team Leader's responsibilities include:

- The management of the day-to-day site activities and implementation of this HASP in the field.
- Participating in and/or conducting Tailgate Safety Meetings and Jobsite Safety Inspections and correcting any shortcomings in a timely manner.
- When a Community Air Monitoring Operating Program (CAMP) is part of the scope, the FTL will set up and maintaining community air monitoring activities and instructing the responsible contractor to implement organic vapor or dust mitigation when necessary.
- Overseeing the implementation of activities specified in the work plan.

2.5 Contractor Responsibilities

The contractor shall develop and implement their own HASP for their employees, lower-tier subcontractors, and consultants. The contractor is responsible for their own health and safety and that of their subcontractors. Contractors operating on the site shall designate their own FTL, HSO and HSM. The contractor's HASP will be at least as stringent as this Langan HASP. The contractor must be familiar with and abide by the requirements outlined in their own HASP. A contractor may elect to adopt Langan's HASP as its own provided that it has given written notification to Langan, but where Langan's HASP excludes provisions pertinent to the contractor's work (i.e., confined space entry); the contractor must provide written addendums to this HASP. Additionally, the contractor must:

- Ensure their employees are trained in the use of all appropriate personal protection equipment (PPE) for the tasks involved;
- Notify Langan of any hazardous material brought onto the job site or site related area, the hazards associated with the material, and must provide a material safety data sheet (MSDS) or safety data sheet (SDS) for the material;
- Have knowledge of, understand, and abide by all current federal, state, and local health and safety regulations pertinent to the work;

- Ensure their employees handling hazardous materials, if identified at the Site, have received current training in the appropriate levels of 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER) if hazardous waste is identified at the Site;
- Ensure their employees handling hazardous materials, if identified at the Site, have been fit-tested within the year on the type respirator they will wear; and
- Ensure all air monitoring is in place pertaining to the health and safety of their employees as required by OSHA 1910.120; and
- All contractors must adherer to all federal, state, and local regulatory requirements.

3.0 TASK/OPERATION SAFETY AND HEALTH RISK ANALYSES

A Task-Hazard Analysis (Table 1) was completed for general construction hazards that may be encountered at the Site. The potential contaminants that might be encountered during the field activities and the exposure limits are listed in Table 2 complete inventory of MSDS/SDS for chemical products used on site is included as Attachment E.

3.1 Specific Task Safety Analysis

3.1.1 Excavation

Langan will observe excavation activities. Langan will don appropriate personal protection equipment (PPE) as required and at a minimum will include safety glasses, safety shoes, high visibility reflective clothing, hardhat and when necessary, hearing protection. Langan will observe excavation activities from a safe distance and coordinate personal movement within the work area with the equipment operators or site manager.

3.1.2 Soil Investigation and Sampling

Sampling the soil requires the donning of chemical resistant gloves in addition to the standard PPE. Langan personnel are not to operate drilling or excavation equipment nor open sampling devices (acetate liners, sonic sample bags, etc.). These tasks are to be completed by the driller or excavation contractor.

3.1.3 Stockpile Sampling

The Langan personnel are not to scale or otherwise climb stockpiles. If the soil sampling plan requires sampling from the stockpile above ground level, samples are to be obtained using suitable excavation equipment operated by the contractor (i.e. front end loader).

3.1.4 Hot Spot Delineation

Hot spot delineation sampling requires additional precautions to mitigate exposure. Langan will monitor indoor dust using air-dust monitoring equipment (DustTrak™ 2 or equivalent). The dust monitoring equipment should be equipped with an alarm. The primary alarm should be set for a specific value in milligrams per cubic meter (mg/m^3) above the 15 minute average background based on analytical data and the time weighted average exposure limits for the constituent of concern (COC). The secondary alarm may be set for a value based on the PEL for the specific COC.

If the primary alarm activates during work, the PM notified, and dust control measures should be implemented and all workers should don half face respirator with HEPA dust filters to continue to work. Dust control measures include applying a fine water spray wet all surfaces in the work area to dampen dust and activating ventilation. Workers can remove half respirators when air borne dust concentrations return to background. If dust mitigation does not lower dust concentrations and dust levels continue to climb, all work should cease when dust concentrations exceed secondary alarm level and the PM should be notified.

3.1.5 Indoor Drilling and Excavation

The work scope may require indoor drilling or drilling in locations where there may not be adequate ventilation sufficient to safely operate any rig or excavation equipment powered by an internal combustion engine. Where possible, all such work should be done by equipment powered by electricity. If such equipment is used and must be directly wired to the buildings electrical system or to an independent system, this work must be completed by a licensed electrician in accordance with all electrical codes applicable to the work.

Indoor work which is to be completed with equipment powered by an internal combustion engine must incorporate air monitoring of carbon monoxide (CO) using calibrated air monitoring equipment (MultiRAE or equivalent). In addition, the work plan should incorporate mitigation for venting engine exhaust fumes directly to the outdoors and for circulating fresh air into the work area.

The OSHA Time Weighted Average (TWA) Permissible Exposure Limit (PEL) for CO from 50 to 35 parts per million (ppm). Langan will monitor CO with a suitable monitoring device. If CO levels exceed 5 ppm, Langan will instruct contractors to begin mitigation measures. These measures are at a minimum:

- Increase air circulation using industrial size fans to bring additional fresh air into the building or vent exhaust to the outside;

- Modify the passive exhaust method being used to increase venting circulation by using wider diameter tubing or sealing tubing connections; or
- Modify the work schedule where the rig is turned off to allow time for CO levels to fall back to background

All work must cease if CO levels reach 35 ppm. The Langan engineer is to report to the PM and H&S officer when an action level is reached.

3.1.6 Construction Dewatering

If required, Langan may sample dewatering treatment system liquids from either the direct discharge standpipe or from a sample port or valve built into the storage tank, Langan will don the necessary PPE including nitrile gloves and if necessary, facial splash guard. Sample ports and valves may only be sampled if they are accessible at ground level. Sampling from heights over 6 feet is prohibited unless Langan field personnel are fully accredited in fall protection and is wearing approved fall protection safety apparatus. The discharge samples will be submitted to an ELAP-certified laboratory for analysis in accordance with the work plan.

3.1.7 Soil Screening and Sampling

Sampling the soil requires the donning of chemical resistant gloves in addition to the standard PPE. Langan personnel are not to operate drilling or excavation equipment nor open sampling devices (acetate liners, sonic sample bags, etc.). These tasks are to be completed by the driller or excavation contractor.

3.1.8 Removal of Underground Storage Tank

If UST excavation and removal activity is initiated, Langan personnel will conduct air monitoring for lower explosion limit (LEL) conditions within the UST excavation itself. This task is to be performed using calibrated air monitoring equipment designed to sound an audio alarm when atmospheric concentrations of VOC are within 10% of the LEL. In normal atmospheric oxygen concentrations, the LEL monitoring may be done with a Wheatstone bridge/catalytic bead type sensor (i.e. MultiRAE). However in oxygen depleted atmospheres (confined space), only an LEL designed to work in low oxygen environments may be used. Best practices require that the LEL monitoring unit be equipped with a long sniffer tube to allow the LEL unit to remain outside the UST excavation. Langan personnel are not to enter the UST excavation nor enter an excavated UST.

In addition to monitoring LEL, Langan personnel will monitor atmospheric VOC concentrations directly downwind of the UST excavation in accordance with standard CAMP procedures using calibrated air monitoring equipment.

3.1.9 Construction Activity Inspection

The contractor will operate equipment used to install the composite cover. Langan personnel will inspect in accordance with specification in the work plan and record the data the work plan requires. The installation of the composite cover is to be done exclusively by the contractor following their own health and safety specifications outlined in their HASPs. Other activities assigned to Langan as part of construction activities are limited to inspection and observations as specified in the work pan. Langan personnel are not to operate or assist in the operation of equipment used in construction activities unless defined as part of an inspection or observation in the work plan.

3.1.10 Backfilling of Excavated Areas to Development Grade

The backfilling contractor will provide their employees with equivalent PPE to protect them from the specific hazards likely to be encountered on-site. Selection of the appropriate PPE must take into consideration: (1) identification of the hazards or suspected hazards; (2) potential exposure routes; and, (3) the performance of the PPE construction (materials and seams) in providing a barrier to these hazards. Langan personnel may survey backfilling material with a calibrated PID; however, as they are not permitted to climb the material delivery truck, the contractor must provide samples from each truck as required.

3.1.11 Drum Sampling

Drilling fluid, rinse water, grossly-contaminated soils samples and cuttings may be containerized in 55-gallon drums for transport and disposal off site. Each drum must be labeled in accordance with the Langan Drum Labeling Standard Operating Procedure (SOP-#9). Langan may collect drum samples, as required, prior to off-site drum disposal. Samples will be placed into laboratory-supplied batch-certified clean glassware and submitted to a NYSDOH ELAP-certified laboratory.

Langan employees and contractors are not to move or open any orphaned (unlabeled) drum found on the site without approval of the project manager.

3.2 Radiation Hazards

No radiation hazards are known or expected at the site.

3.3 Physical Hazards

Physical hazards, which may be encountered during site operations for this project, are detailed in Table 1.

3.3.1 Explosion

No explosion hazards are expected for the scope of work at this site.

3.3.2 Heat Stress

The use of Level C protective equipment, or greater, may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 72°F or above. Table 6 presents the suggested frequency for such monitoring. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Refer to the Table 7 to assist in assessing when the risk for heat related illness is likely. To use this table, the ambient temperature and relative humidity must be obtained (a regional weather report should suffice). Heat stress monitoring should be performed by the HSO or the FTL, who shall be able to recognize symptoms related to heat stress.

To monitor the workers, be familiar with the following heat-related disorders and their symptoms:

- **Heat Cramps:** Painful spasm of arm, leg or abdominal muscles, during or after work
- **Heat Exhaustion:** Headache, nausea, dizziness; cool, clammy, moist skin; heavy sweating; weak, fast pulse; shallow respiration, normal temperature
- **Heat Stroke**: Headache, nausea, weakness, hot dry skin, fever, rapid strong pulse, rapid deep respirations, loss of consciousness, convulsions, coma. *This is a life threatening condition***.**

Do not permit a worker to wear a semi-permeable or impermeable garment when they are showing signs or symptoms of heat-related illness.

To monitor the worker, measure:

- **Heart rate:** Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third. A worker cannot return to work after a rest period until their heart rate is below 100 beats per minute.
- **Oral temperature:** Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking). If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period. A worker cannot return to work after a rest period until their oral temperature is below 99.6°F. If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third. Do not

permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

Prevention of Heat Stress - Proper training and preventative measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:

- Adjust work schedules.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, id., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
    - Maintain water temperature 50° to 60°F (10° to 16.6°C).
    - Provide small disposal cups that hold about four ounces (0.1 liter).
    - Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.
    - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.
    - Train workers to recognize the symptoms of heat related illness.

3.3.3 Cold-Related Illness

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally called frostbite.

- **Hypothermia -** Hypothermia is defined as a decrease in the patient core temperature below 96°F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interference with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a "cold" ambient temperature. Symptoms of hypothermia include: shivering, apathy, listlessness, sleepiness, and unconsciousness.

- **Frostbite -** Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 20^{o}F. Symptoms of frostbite are: a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale, and solid.

<u>Prevention of Cold-Related Illness</u> - To prevent cold-related illness:

- Educate workers to recognize the symptoms of frostbite and hypothermia
- Identify and limit known risk factors:
- Assure the availability of enclosed, heated environment on or adjacent to the site.
- Assure the availability of dry changes of clothing.
- Assure the availability of warm drinks.
- Start (oral) temperature recording at the job site:
- At the FSO or Field Team Leader's discretion when suspicion is based on changes in a worker's performance or mental status.
- At a worker's request.
- As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20^{o}F, or wind-chill less than 30^{o}F with precipitation).
- As a screening measure whenever anyone worker on the site develops hypothermia.

Any person developing moderate hypothermia (a core temperature of 92^{o}F) cannot return to work for 48 hours.

3.3.4 Noise

Work activities during the proposed activities may be conducted at locations with high noise levels from the operation of equipment. Hearing protection will be used as necessary.

3.3.5 Hand and Power Tools

The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. All hand and power tools should be inspected for health and safety hazards prior to use. If deemed unserviceable/un-operable, notify supervisor and tag equipment out of service. Ground Fault Circuit Interrupters (GFCIs) are required for all power tools requiring direct electrical service.

3.3.6 Slips, Trips and Fall Hazards

Care should be exercised when walking at the site, especially when carrying equipment. The presence of surface debris, uneven surfaces, pits, facility equipment, and soil piles contribute to tripping hazards and fall hazards. To the extent possible, all hazards should be identified and marked on the site, with hazards communicated to all workers in the area.

3.3.7 Utilities (Electrocution and Fire Hazards)

3.3.7.1 Utility Clearance

The possibility of encountering underground utilities poses fire, explosion, and electrocution hazards. All excavation work will be preceded by review of available utility drawings and by notification of the subsurface work to the N.Y. One –Call--Center.

3.3.7.2 Lockout-Tagout

The potential adverse effects of electrical hazards include burns and electrocution, which could result in death. Therefore, there is a procedure that establishes the requirements for the lockout/tagout (LOTO) of energy isolating devices in accordance with the OSHA electrical lockout and tagging requirements as specified in 29 CFR 1926.417. This procedure will be used to ensure that all machines and equipment are isolated from potentially hazardous energy. If possible, equipment that could cause injury due to unexpected energizing, start-up, or release of stored energy will be locked/tagged, before field personnel perform work activities.

Depending upon the specific work task involved, Langan’s SSC or FTL will serve as the authorized lockout/tagout coordinator, implement the lockout/tagout procedure and will be responsible to locate, lock and tag valves, switches, etc.

SPECIAL NOTE: Project personnel will assume that all electrical equipment at surface, subsurface and overhead locations is energized, until equipment has been designated and confirmed as de-energized by a utility company representative. Langan will notify the designated utility representative prior to working adjacent to this equipment and will verify that the equipment is energized or de-energized in the vicinity of the work location.

No project work shall be performed by Langan personnel or subcontractors on or near energized electrical lines or equipment unless hazard assessments are completed in writing, reviewed by Langan’s SSHO, and clearly communicated to the field personnel.

The FTL shall conduct a survey to locate and identify all energy isolating devices. They shall be certain which switches, valves or other isolating devices apply to the equipment. The lockout/tagout procedure involves, but is not limited to, electricity, motors, steam, natural gas, compressed air, hydraulic systems, digesters, sewers, etc.

3.3.8 Physical Hazard Considerations for Material Handling

There are moderate to severe risks associated with moving heavy objects at the Site. The following physical hazards should be considered when handling materials at the Site:

- Heavy objects will be lifted and moved by mechanical devices rather than manual effort whenever possible.
- The mechanical devices will be appropriate for the lifting of moving task and will be operated only by trained and authorized personnel.
- Objects that require special handling or rigging will only be moved under the guidance of a person who has been specifically trained to move such objects.
- Lifting devices will be inspected, certified, and labeled to confirm their weight capacities. Defective equipment will be taken out of service immediately and repaired or destroyed.
- The wheels of any trucks being loaded or unloaded will be chocked to prevent movement. Outriggers will be fully extended on a flat, firm surface during operation.
- Personnel will not pass under a raised load, nor will a suspended load be left unattended.
- Personnel will not be carried on lifting equipment, unless it is specifically designed to carry passengers.
- All reciprocating, rotating, or other moving parts will be guarded at all times.
- Accessible fire extinguishers, currently (monthly) inspected, will be available in all mechanical lifting devices.
- Verify all loads/materials are secure before transportation.

Material handling tasks that are unusual or require specific guidance will need a written addendum to this HASP. The addendum must identify the lifting protocols before the tasks are performed. Upon approval, the plan must be reviewed with all affected employees and documented. Any deviation from a written plan will require approval by the Langan HSM.

3.3.9 Hearing Conservation

Under the construction industry standard, the maximum permissible occupational noise exposure is 90 dbA (8-hour TWA), and noise levels in excess of 90 dbA must be reduced through feasible administrative and engineering controls. (20 CFR 1926.52). Hearing protection is required when working within 15 feet of vacuum extraction equipment and drill rigs.

3.3.9 Open Water

Employees working over or near water, where the danger of drowning exists, shall be provided with U.S. Coast Guard-approved life jackets or buoyant work vests. Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

And should a worker fall into the water, OSHA requires (29 CFR 1926.106(c)) that ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. The distance between ring buoys shall not exceed 200 feet. Another remedial action required by OSHA (29 CFR 1926.106(d)) is the use of lifesaving skiffs.

OSHA requires that at least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water and must include the following provisions.

- The skiff must be in the water or capable of being quickly launched by one person.
- At least one person must be present and specifically designated to respond to water emergencies and operate the skiff at all times when there are employees above water.
- When the operator is on break another operator must be designated to provide requisite coverage when there are employees above water.
- The designated operator must either have the skiff staffed at all times or have someone remain in the immediate area such that the operator can quickly reach the skiff and perform rescue services.
- The skiff operator maybe assigned other tasks provided the tasks do not interfere with the operator’s ability to quickly reach the skiff.
- A communication system, such as a walkie-talkie, must be used to inform the skiff operator of an emergency and to inform the skiff operator where the skiff is needed.
- The skiff must be equipped with both a motor and oars.

With regard to the number of skiffs required and the appropriate maximum response time, the following factors must be evaluated:

- The number of work locations where there is a danger of falling into water;
- The distance to each of those locations;
- Water temperature and currents;
- Other hazards such as, but not limited to, rapids, dams, and water intakes;

Other regulations that present S&H practices and PPE for work on or near water include: 29 CFR 1910, Subpart T (401 – 440)

3.4 Biological Hazards

3.4.1 Animals

There is a possibility of encountering wildlife including reptiles, rodents and other small and medium size mammals. The Langan personnel is to avoid interacting with any wildlife.

3.4.2 Insects

Ticks and other biting or stinging insects may to be encountered during site operations. Langan personnel should take necessary precautions including donning long sleeve shirts and insecticide to prevent bites and stings. After field work, Langan personnel should perform a complete visual inspection of their clothing to insure they are not inadvertently harboring ticks. If they do observe a tick bite, they are to contact the HSM or HSO and report the event.

3.4.3 Plants

Poisonous plants may to be encountered during site operations. Langan personnel should take necessary precautions including donning long sleeve shirts and applying preventative poison Ivy/Sumac lotion to prevent or limit effects of exposure. If after field work, Langan employees do observe a reaction to poisonous plant exposure, they are to contact the HSM or HSO and report the event.

3.4.4 Coronavirus

3.4.4.1 General Preventative Measures

Field personnel must follow general proper hygiene measures while in the field including:

- Avoid touching eyes, nose and mouth.
- Cover cough or sneeze with tissue, and throw in trash.
- Wash hands often with soap and water for 20 seconds after going to bathroom, before eating, after blowing nose, coughing or sneezing.
- Use hand sanitizer with at least 60% alcohol if soap and water are not available.
- Avoid physical contact with other people (e.g., no handshakes).
- Maintain a safe distance of at least 6 feet from other people (social distancing).

3.4.4.2 Construction Trailers

Employees should avoid use of shared construction trailers or where employees cannot maintain a safe distance (minimum 6 feet) from other workers. If trailer use is needed, areas such as desks, phones, chairs and other common areas, should be cleaned and disinfected before and after use. Protocols should be developed to minimize trailer use to essential personal, restrict use from any workers who are ill or showing symptoms of being ill, and ensure a safe distance of 6 feet can be established between workers.

3.4.4.3 Communication

Include Coronavirus topics and prevention topics in daily tailgate meetings to ensure Coronavirus awareness is communicated daily. Discussions can focus on general topics including: social distancing, prevention measures for field personnel, signs and symptoms and recent news on the Coronavirus. Site-specific topics should include minimizing face-to-face contact, disinfecting/sterilizing field equipment, use of PPE to reduce exposure, site security and other potential exposure issues/concerns.

3.4.4.4 Sick/Ill Workers

No Langan employee is permitted to be onsite when ill and/or showing potential symptoms of the Coronavirus. Symptoms of the Coronavirus may appear 2-14 days after exposure and can range from mild to severe. The most common symptoms include: fever, fatigue, dry cough and shortness of breath. If an employee or subcontractor is observed being ill or exhibiting symptoms of Coronavirus, employees must immediately utilize their Stop Work Authority and contact their project manager to address the situation. If an employee observes another worker onsite exhibiting symptoms of Coronavirus, immediately utilize Stop Work Authority and notify their project manager and site construction manager or safety officer. Work should resume when the safety and health of Langan and subcontractors is adequately addressed.

3.5 Additional Safety Analysis

3.5.1 Presence of Non-Aqueous Phase Liquids (NAPL)

There is potential for exposure to NAPL at this site. Special care and PPE should be considered when NAPL is observed as NAPL is a typically flammable fluid and releases VOCs known to be toxic and/or carcinogenic. If NAPL is present in a monitoring well, vapors from the well casing may contaminate the work area breathing zone with concentrations of VOCs potentially exceeding health and safety action levels. In addition, all equipment used to monitor or sample NAPL (or ground water from wells containing NAPL) must be intrinsically safe. Equipment that directly contacts NAPL must also be resistant to organic solvents.

At a minimum, a PID should be used to monitor for VOCs when NAPL is observed. If NAPL is expected to be observed in an excavation or enclosed area, air monitoring must be started using calibrated air monitoring equipment designed to sound an audio alarm when atmospheric concentrations of VOC are within 10% of the LEL. In normal atmospheric oxygen concentrations, the LEL monitoring may be done with a Wheatstone bridge/catalytic bead type sensor (i.e. MultiRAE). However in oxygen depleted atmospheres (confined space), only an LEL designed to work in low oxygen environments may be used. Best practices require that the LEL monitoring unit be equipped with a long sniffer tube to allow the LEL unit to remain outside the UST excavation.

When NAPL is present, Langan personnel are required to use disposable nitrile gloves at all times to prevent skin contact with contaminated materials. They should also consider having available a respirator and protective clothing (Tyvek® overalls), especially if NAPL is in abundance and there are high concentrations of VOCs.

All contaminated disposables including PPE and sampling equipment must be properly disposed of in labeled 55-gallong drums

3.6 Job Safety Analysis

A Job Safety Analysis (JSA) is a process to identify existing and potential hazards associated with each job or task so these hazards can be eliminated, controlled or minimized. A JSA will be performed at the beginning of each work day, and additionally whenever an employee begins a new task or moves to a new location. All JSAs must be developed and reviewed by all parties involved. A blank JSA form and documentation of completed JSAs are in Attachment G.

4.0 PERSONNEL TRAINING

4.1 Basic Training

Completion of an initial 40-hour HAZWOPER training program as detailed in OSHA's 29 CFR 1910.120(e) is required for all employees working on a site engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances, health hazards, or safety hazards as defined by 29 CFR 1910.120(a). Annual 8-hour refresher training is also required to maintain competencies to ensure a safe work environment. In addition to these training requirements, all employees must complete the OSHA 10 hour Construction Safety and Health training and supervisory personnel must also receive eight additional hours of specialized management training. Training records are maintained by the HSM.

4.2 Initial Site-Specific Training

Training will be provided to specifically address the activities, procedures, monitoring, and equipment for site operations at the beginning of each field mobilization and the beginning of each discrete phase of work. The training will include the site and facility layout, hazards, and emergency services at the site, and will detail all the provisions contained within this HASP. For a HAZWOPER operation, training on the site must be for a minimum of 3 days. Specific issues that will be addressed include the hazards described in Section 3.0.

4.3 Tailgate Safety Briefings

Before starting work each day or as needed, the Langan HSO will conduct a brief tailgate safety meeting to assist site personnel in conducting their activities safely. Tailgate meetings will be documented in Attachment H. Briefings will include the following:

- Work plan for the day;
- Review of safety information relevant to planned tasks and environmental conditions;
- New activities/task being conducted;
- Results of Jobsite Safety Inspection Checklist;
- Changes in work practices;
- Safe work practices; and
- Discussion and remedies for noted or observed deficiencies.

5.0 MEDICAL SURVEILLANCE

All personnel who will be performing field work involving potential exposure to toxic and hazardous substances (defined by 29 CFR 1910.120(a)) will be required to have passed an initial baseline medical examination, with follow-up medical exams thereafter, consistent with 29 CFR 1910.120(f). Medical evaluations will be performed by, or under the direction of, a physician board-certified in occupational medicine.

Additionally, personnel who may be required to perform work while wearing a respirator must receive medical clearance as required under CFR 1910.134(e), *Respiratory Protection*. Medical evaluations will be performed by, or under the direction of, a physician board-certified in occupational medicine. Results of medical evaluations are maintained by the HSM.

5.1 Mercury Monitoring

Langan includes medical monitoring for mercury during the initial baseline and annual physical.

6.0 PERSONAL PROTECTIVE EQUIPMENT

6.1 Levels of Protection

Langan will provide PPE to Langan employees to protect them from the specific hazards they are likely to encounter on-site. Direct hired contractors will provide their employees with equivalent PPE to protect them from the specific hazards likely to be encountered on-site. Selection of the appropriate PPE must take into consideration: (1) identification of the hazards or suspected hazards; (2) potential exposure routes; and, (3) the performance of the PPE construction (materials and seams) in providing a barrier to these hazards.

Based on anticipated site conditions and the proposed work activities to be performed at the site, Level D protection will be used. The upgrading/downgrading of the level of protection will be based on continuous air monitoring results as described in Section 6.0 (when applicable). The decision to modify standard PPE will be made by the site HSO or FTL after conferring with the PM. The levels of protection are described below.

Level D Protection (as needed)

- Safety glasses with side shields or chemical splash goggles
- Safety boots/shoes
- Coveralls (Tyvek® or equivalent)
- Hard hat
- Long sleeve work shirt and work pants
- Nitrile gloves
- Hearing protection
- Reflective safety vest

Level D Protection (Modified, as needed)

- Safety glasses with sideshields or chemical splash goggles
- Safety boots/shoes (toe-protected)
- Disposable chemical-resistant boot covers
- Coveralls (polycoated Tyvek or equivalent to be worn when contact with wet contaminated soil, groundwater, or non-aqueous phase liquids is anticipated)
- Hard hat
- Long sleeve work shirt and work pants
- Nitrile gloves
- Hearing protection (as needed)
- Personal floatation device (for work within 5 ft of the water)
- Reflective traffic vest

Level C Protection (as needed)

- Full or Half face, air-purifying respirator, with NIOSH approved HEPA filter
- Inner (latex) and outer (nitrile) chemical-resistant gloves
- Safety glasses with side shields or chemical splash goggles
- Chemical-resistant safety boots/shoes
- Hard hat
- Long sleeve work shirt and work pants
- Coveralls (Tyvek® or equivalent)
- Hearing protection (as needed)
- Reflective safety vest

The action levels used in determining the necessary levels of respiratory protection and upgrading to Level C are summarized in Table 4. The written Respiratory Protection Program is maintained by the HSM and is available if needed. The monitoring procedures and equipment are outlined in Section 6.0 (when applicable).

6.2 Respirator Fit-Test

All Langan employees who may be exposed to hazardous substances at the work site are in possession of a full or half face-piece, air-purifying respirator and have been successfully fit-tested within the past year. Fit-test records are maintained by the HSM.

6.3 Respirator Cartridge Change-Out Schedule

Respiratory protection is required to be worn when certain action levels (table 2) are reached. A respirator cartridge change-out schedule has been developed in order to comply with 29 CFR 1910.134. The respirator cartridge change-out schedule for this project is as follows:

- Cartridges shall be removed and disposed of at the end of each shift, when cartridges become wet or wearer experiences breakthrough, whichever occurs first.
- If the humidity exceeds 85%, then cartridges shall be removed and disposed of after 4 hours of use.

Respirators shall not be stored at the end of the shift with contaminated cartridges left on. Cartridges shall not be worn on the second day, no matter how short the time period was the previous day they were used.

7.0 AIR QUALITY MONITORING AND ACTIONS LEVELS

7.1 Monitoring During Site Operations

Atmospheric air monitoring results may be collected and used to provide data to determine when exclusion zones need to be established and when certain levels of personal protective equipment are required. For all instruments there are Site-specific action level criteria which are used in making field health and safety determinations. Other data, such as the visible presence of contamination or the steady state nature of air contaminant concentration, are also used in making field health and safety decisions. Therefore, the HSO may establish an exclusion zone or require a person to wear a respirator even though atmospheric air contaminant concentrations are below established HASP action levels.

During site work involving disturbance of petroleum-impacted or fill material, real time air monitoring may be conducted for volatile organic compounds (VOCs). A photoionization detector

(PID) and/or flame ionization detector (FID) will be used to monitor concentrations of VOCs at personnel breathing-zone height. Air monitoring will be the responsibility of the HSO or designee. Air monitoring may be conducted during intrusive activities associated with the completion of excavation, debris removal, and soil grading. All manufacturers' instructions for instrumentation and calibration will be available onsite.

Subcontractors' air monitoring plans must be equal or more stringent as the Langan plan.

An air monitoring calibration log is provided in Attachment D of this HASP.

7.1.1 Volatile Organic Compounds

Monitoring with a PID, such as a MiniRAE 2000 (10.6v) or equivalent may occur during intrusive work in the AOCs. Colormetric Indicator Tubes for benzene may be used as backup for the PID, if measurements remain above background monitor every 2 hours. The HSO will monitor the employee breathing zone at least every 30 minutes, or whenever there is any indication that concentrations may have changed (odors, visible gases, etc.) since the last measurement. If VOC levels are observed above 5 ppm for longer than 5 minutes or if the site PPE is upgraded to Level C, the HSO will begin monitoring the site perimeter at a location downwind of the AOC every 30 minutes in addition to the employee breathing zone. Instrument action levels for monitored gases are provided in Table 4.

7.1.2 Metals

Based upon the site historical fill, there is a potential for the soils to contain PAHs and metals. During invasive procedures which have the potential for creating airborne dust, such as excavation of dry soils, a real time airborne dust monitor such as a Mini-Ram may be used to monitor for air particulates. The HSO will monitor the employee breathing zone at least every 30 minutes, or whenever there is any indication that concentrations may have changed (appearance of visible dust) since the last measurement. If dust levels are observed to be greater than 0.100 mg/m^3 or visible dust is observed for longer than 15 minutes or if the site PPE is upgraded to Level C, the HSO will begin monitoring the site perimeter at a location downwind of the AOC every 30 minutes in addition to the employee breathing zone. Instrument action levels for dust monitoring are provided in Table 4.

7.2 Monitoring Equipment Calibration and Maintenance

Instrument calibration shall be documented and included in a dedicated safety and health logbook or on separate calibration pages of the field book. All instruments shall be calibrated before and after each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

All instruments shall be operated in accordance with the manufacturers' specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on site by the HSO for reference.

7.3 Determination of Background Levels

Background (BKD) levels for VOCs and dust will be established prior to intrusive activities within the AOC at an upwind location. A notation of BKD levels will be referenced in the daily monitoring log. BKD levels are a function of prevailing conditions. BKD levels will be taken in an appropriate upwind location as determined by the HSO.

Table 4 lists the instrument action levels.

8.0 COMMUNITY AIR MONITORING PROGRAM

Community air monitoring may be conducted in compliance with the NYSDOH Generic CAMP outlined below:

Monitoring for dust and odors will be conducted during all ground intrusive activities by the FTL. Continuous monitoring on the perimeter of the work zones for odor, VOCs, and dust may be required for all ground intrusive activities such as soil excavation and handling activities. The work zone is defined as the general area in which machinery is operating in support of remediation activities. A portable PID will be used to monitor the work zone and for periodic monitoring for VOCs during activities such as soil and groundwater sampling and .soil excavation. The site perimeter will be monitored for fugitive dust emissions by visual observations as well as instrumentation measurements (if required). When required, particulate or dust will be monitored continuously with real-time field instrumentation that will meet, at a minimum, the performance standards from DER-10 Appendix 1B.

If VOC monitoring is required, the following actions will be taken based on VOC levels measured:

- If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total VOC levels at the downwind perimeter of the hot zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the hot 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 above background for the 15-minute average.
- If the total VOC level is above 25 ppm at the perimeter of the hot zone, activities will be shut down.

If dust monitoring with field instrumentation is required, the following actions will be taken based on instrumentation measurements:

- If the downwind particulate level is 100 micrograms per cubic meter (µg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression must be employed. Work may continue with dust suppression techniques provided that downwind PM10 levels do not exceed 150 µg/m³ above the background level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM10 levels are greater than 150 µg/m³ above the background 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 PM10 concentration to within 150 µg/m³ of the upwind level and in preventing visible dust migration.

8.1 Vapor Emission Response Plan

This section applies if VOC monitoring is required. If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the hot zone, boring and well installation, and excavation activities will be halted or odor controls will be employed, and monitoring continued. When work shut-down occurs, downwind air monitoring as directed by the HSO or FTL will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

If the organic vapor level decreases below 5 ppm above background, sampling and boring and well installation can resume, provided:

- The organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 1 ppm over background, and
- More frequent intervals of monitoring, as directed by the HSO or FTL, are conducted.

8.2 Major Vapor Emission

This section applies if VOC monitoring is required. If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted or odor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the hot zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

- Sustained organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes, or
- Organic vapor levels greater than 5 ppm above background for any time period.

8.3 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

- The local police authorities will immediately be contacted by the HSO or FTL and advised of the situation;
- Frequent air monitoring will be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO or FTL; and
- All Emergency contacts will go into effect as appropriate.

8.4 Dust Suppression Techniques

Preventative measures for dust generation may include wetting site fill and soil, construction of an engineered construction entrance with gravel pad, a truck wash area, covering soils with tarps, and limiting vehicle speeds to five miles per hour.

Work practices to minimize odors and vapors include limiting the time that the excavations remain open, minimizing stockpiling of contaminated-source soil, and minimizing the handling of contaminated material. Offending odor and organic vapor controls may include the application of foam suppressants or tarps over the odor or VOC source areas. Foam suppressants may include biodegradable foams applied over the source material for short-term control of the odor and VOCs.

If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: direct load-out of soils to trucks for off-site disposal; use of chemical odorants in spray or misting systems; and, use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

9.0 WORK ZONES AND DECONTAMINATION

9.1 Site Control

Work zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas.

Any person working in an area where the potential for exposure to site contaminants exists will only be allowed access after providing the HSO with proper training and medical documentation.

Exclusion Zone (EZ) - All activities which may involve exposure to site contaminants, hazardous materials and/or conditions should be considered an EZ. Decontamination of field equipment will also be conducted in the Contaminant Reduction Zone (CRZ) which will be located on the perimeter of the EZ. The EZ and the CRZ will be clearly delineated by cones, tapes or other means. The HSO may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the HSO allowing adequate space for the activity to be completed, field members and emergency equipment.

9.2 Contamination Zone

9.2.1 Personnel Decontamination Station

Personal hygiene, coupled with diligent decontamination, will significantly reduce the potential for exposure.

9.2.2 Minimization of Contact with Contaminants

During completion of all site activities, personnel should attempt to minimize the chance of contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination as PPE is intended to minimize accidental contact. This may ultimately minimize the degree of decontamination required and the generation of waste materials from site operations.

Field procedures will be developed to control over spray and runoff and to ensure that unprotected personnel working nearby are not affected.

9.2.3 Personnel Decontamination Sequence

Decontamination may be performed by removing all PPE used in EZ and placing it in drums/trash cans at the CRZ. Baby wipes should be available for wiping hands and face. Drums/trash cans-will be labeled by the field crews in accordance with all local, state, and federal requirements. Management plans for contaminated PPE, and tools are provided below.

9.2.4 Emergency Decontamination

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination and wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment. If the injured person can be moved, he/she will be decontaminated by site personnel as described above before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury), provisions shall be made to ensure that emergency response personnel will be able to respond to the victim without being exposed to potentially hazardous atmospheric conditions. If the potential for inhalation hazards exist, such as with open excavation, this area will be covered with polyethylene sheeting to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition, potential contaminants, and provided with all pertinent data.

9.2.5 Hand-Held Equipment Decontamination

Hand-held equipment includes all monitoring instruments as stated earlier, samples, hand tools, and notebooks. The hand-held equipment is dropped at the first decontamination station to be decontaminated by one of the decontamination team members. These items must be decontaminated or discarded as waste prior to removal from the CRZ.

To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using wipes or paper towels if contamination is visually evident. Sampling equipment, hand tools, etc. will be cleaned with non-phosphorous soap to remove any potentially contaminated soil, and rinsed with deionized water. All decontamination fluids will be containerized and stored on-site pending waste characterization sampling and appropriate off-site disposal.

9.2.6 Heavy Equipment Decontamination

All heavy equipment and vehicles arriving at the work site will be free from contamination from offsite sources. Any vehicles arriving to work that are suspected of being impacted will not be permitted on the work site. Potentially contaminated heavy equipment will not be permitted to leave the EZ unless it has been thoroughly decontaminated and visually inspected by the HSO or his designee.

9.3 Support Zone

The support zone or cold zone will include the remaining areas of the job site. Break areas and support facilities (include equipment storage and maintenance areas) will be located in this zone. No equipment or personnel will be permitted to enter the cold zone from the hot zone without passing through the decontamination station in the warm zone (if necessitated). Eating, smoking, and drinking will be allowed only in this area.

9.4 Communications

The following communications equipment will be utilized as appropriate.

- Telephones - A cellular telephone will be located with the HSO for communication with the HSM and emergency support services/facilities.
- Hand Signals - Hand signals shall be used by field teams, along with the buddy system. The entire field team shall know them before operations commence and their use covered during site-specific training. Typical hand signals are the following:

Hand Signal	Meaning
Hand gripping throat	Out of air; cannot breathe
Grip partners wrists or place both hands around waist	Leave immediately without debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm alright; I understand
Thumbs down	No; negative
Simulated "stick" break with fists	Take a break; stop work

9.5 The Buddy System

When working in teams of two or more, workers will use the "buddy system" for all work activities to ensure that rapid assistance can be provided in the event of an emergency. This requires work groups to be organized such that workers can remain close together and maintain visual contact with one another. Workers using the "buddy system" have the following responsibilities:

- Provide his/her partner with assistance.
- Observe his/her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his/her partner's PPE.
- Notify the HSO or other site personnel if emergency service is needed.

10.0 NEAREST MEDICAL ASSISTANCE

The address and telephone number of the nearest hospital:

NYU Medical Center
550 1st Avenue
New York, New York
212-263-7300

Map with directions to the hospital are shown in Figure 2. This information will either be posted prominently at the site or will be available to all personnel all of the time. Further, all field personnel, including the HSO & FTL, will know the directions to the hospital.

11.0 STANDING ORDERS/SAFE WORK PRACTICES

The standing orders, which consist of a description of safe work practices that must always be followed while on-site by Langan employees and contractors, are shown in Attachment A. The site HSO and FTL each have the responsibility for enforcing these practices. The standing orders will be posted prominently at the site, or are made available to all personnel at all times. Those who do not abide by these safe work practices will be removed from the site.

12.0 SITE SECURITY

No unauthorized personnel shall be permitted access to the work areas.

13.0 UNDERGROUND UTILITIES

As provided in Langan's Underground Utility Clearance Guidelines, the following safe work practices should be followed by Langan personnel and the contractor before and during subsurface work in accordance with federal, state and local regulations:

- Obtain available utility drawings from the property owner/client or operator.
- Provide utility drawings to the project team.
- In the field, mark the proposed area of subsurface disturbance (when possible).
- Ensure that the utility clearance system has been notified.
- Ensure that utilities are marked before beginning subsurface work.
- Discuss subsurface work locations with the owner/client and contractors.

- Obtain approval from the owner/client and operators for proposed subsurface work locations.
- Use safe digging procedures when applicable.
- Stay at least 10 feet from all equipment performing subsurface work.

14.0 SITE SAFETY INSPECTION

The Langan HSO or alternate will check the work area daily, at the beginning and end of each work shift or more frequently to ensure safe work conditions. The HSO or alternate must complete the Jobsite Safety Inspection Checklist, found in Attachment F. Any deficiencies shall be shared with the FTL, HSM and PM and will be discussed at the daily tailgate meeting.

15.0 HAND AND POWER TOOLS

All hand- and electric-power tools and similar equipment shall be maintained in a safe operating condition. All electric-power tools must be inspected before initial use. Damaged tools shall be removed immediately from service or repaired. Tools shall be used only for the purpose for which they were designed. All users must be properly trained in their safe operation.

16.0 EMERGENCY RESPONSE

16.1 General

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff is essential. Specific elements of emergency support procedures that are addressed in the following subsections include communications, local emergency support units, and preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures. In case of emergency, in addition to 911, call *Incident Intervention®* at 1-888-479-7787 to report their injuries. For all other communications, contact the Langan Incident Hotline at **(800) 9-LANGAN** (800-952-6426) extension 4699 as soon as possible.

Should outside assistance be needed for accidents, fire, or release of hazardous substances, the emergency numbers will be available and posted at the site (Table 5) where a readily accessible telephone is made available for emergency use.

Also, in the event of an incident where a team member becomes exposed or suffers from an acute symptom from contact with site materials and has to be taken to a hospital, a short medical data sheet (Attachment T) for that individual will be made available to the attending physician. The medical data sheet will include the following:

- Name, address, home phone
- Age, height, weight
- Name of person to be notified in case of an accident
- Allergies
- Particular sensitivities
- Does he/she wear contact lenses
- Short checklist of previous illness
- Name of personal physician and phone
- Name of company physician and phone
- Prescription and non-prescription medications currently used.

A sample medical data sheet is included in Attachment T.

16.2 Responsibilities

16.2.1 Health and Safety Officer (HSO)

The HSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The HSO is responsible for ensuring the HSM are notified of all incidents, all injuries, near misses, fires, spills, releases or equipment damage. The HSO is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the HSM can notify OSHA within the required time frame.

16.2.2 Emergency Coordinator

The HSO or their designated alternate will serve as the Emergency Coordinator. The Emergency Coordinator is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. They are also responsible for ensuring the HSM are notified of all incidents, all injuries, near misses, fires, spills, releases or equipment damage. The Emergency Coordinator is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized.

The Emergency Coordinator shall locate emergency phone numbers and identify hospital routes prior to beginning work on the sites. The Emergency Coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator is responsible for implementing the Emergency Response Plan.

16.2.3 Site Personnel

Project site personnel are responsible for knowing the Emergency Response Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency. Project site personnel, including all subcontractors will be trained in the Emergency Response Plan.

16.3 Communications

Once an emergency situation has been stabilized, or as soon as practically, the injured Langan personnel should contact *Incident Intervention®* at 1-888-479-7787 to report their injuries. For all other communications, contact the Langan Incident Hotline at **(800) 9-LANGAN** (800-952-6426) extension 4699 as soon as possible.

16.4 Local Emergency Support Units

In order to be able to deal with any emergency that might occur during investigative activities at the site, the Emergency Notification Numbers (Table 5) will be posted and provided to all personnel conducting work within the EZ.

Figure 2 shows the hospital route map. Outside emergency number 911 and local ambulance should be relied on for response to medical emergencies and transport to emergency rooms. Always contact first responders when there are serious or life threatening emergencies on the site. Project personnel are instructed not to drive injured personnel to the Hospital. In the event of an injury, provide first aid and keep the injured party calm and protected from the elements and treat for shock when necessary.

16.5 Pre-Emergency Planning

Langan will communicate directly with administrative personnel from the emergency room at the hospital in order to determine whether the hospital has the facilities and personnel needed to treat cases of trauma resulting from any of the contaminants expected to be found on the site. Instructions for finding the hospital will be posted conspicuously in the site office and in each site vehicle.

16.6 Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the HSO immediately. First-aid equipment will be available on site at the following locations:

- First Aid Kit: Contractor Vehicles
- Emergency Eye Wash: Contractor Vehicles

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that has been set up. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

16.7 Personnel with current first aid and CPR certification will be identified.

Only in non-emergency situations may an injured person be transported to an urgent care facility. Due to hazards that may be present at the site and the conditions under which operations are conducted, it is possible that an emergency situation may develop. Emergency situations can be characterized as injury or acute chemical exposure to personnel, fire or explosion, environmental release, or hazardous weather conditions.

16.8 Emergency Site Evacuation Routes and Procedures

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs as a result of the site investigation activities, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, the Langan Project Manager will be verbally notified immediately. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at the nearest intersection to be accounted for and to receive further instructions.

In the event that an emergency situation arises, the FTL will implement an immediate evacuation of all project personnel due to immediate or impending danger. The FTL will also immediately communicate with the contractor to coordinate any needed evacuation of the property.

The FTL or Site Supervisor will give necessary instructions until the Designated Incident Commander (IC) assumes control. After the emergency has been resolved, the FTL or Site Supervisor will coordinate with the IC and indicate when staff should resume their normal duties. If dangers are present for those at the designated assembly point, another designated location of assembly will be established.

It will be the responsibility of the FTL or Site Supervisor to report a fire or emergency, assess the seriousness of the situation, and initiate emergency measures until the arrival of the local fire fighters or other first responders, should they be necessary. The FTL, working with emergency responders, may also order the closure of the Site for an indefinite period as long as it is deemed necessary.

Under no circumstances will incoming visitors be allowed to proceed to the area of concern, once an emergency evacuation has been implemented. Visitors or other persons present in the area of the emergency shall be instructed to evacuate the area. The FTL will ensure that access roads are not obstructed and will remain on-site to provide stand-by assistance upon arrival of emergency personnel.

If it is necessary to temporarily control traffic in the event of an emergency, those persons controlling traffic will wear proper reflection warning vests until the arrival of police or fire personnel.

16.8.1 Designated Assembly Locations

All personnel will evacuate the site and assemble at a designated assembly location. The assembly location will be designated by Langan personnel and discussed during each shift's pre-job safety briefing.

16.8.2 Accounting for Personnel

All contractor and subcontractor supervisors are responsible for the accounting of all personnel assembled at the designed assembly area. The Designated Incident Commander shall be notified if personnel are not found.

16.9 Fire Prevention and Protection

In the event of a fire or explosion, procedures will include immediately evacuating the site and notification of the Langan Project Manager of the investigation activities. Portable fire extinguishers will be provided at the work zone. The extinguishers located in the various locations should also be identified prior to the start of work. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

16.9.1 Fire Prevention

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials.
- Storage of flammable liquids and gases away from oxidizers.
- Shutting off engines to refuel.
- Grounding and bonding metal containers during transfer of flammable liquids.
- Use of UL approved flammable storage cans.
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities.

The person responsible for the control of fuel source hazards and the maintenance of fire prevention and/or control equipment is the HSO.

16.10 Significant Vapor Release

Based on the proposed tasks, the potential for a significant vapor release is low. However, if a release occurs, the following steps will be taken:

- Move all personnel to an upwind location. All non-essential personnel shall evacuate.
- Upgrade to Level C Respiratory Protection.
- Downwind perimeter locations shall be monitored for volatile organics.
- If the release poses a potential threat to human health or the environment in the community, the Emergency Coordinator shall notify the Langan Project Manager.
- Local emergency response coordinators will be notified.

16.11 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet (MSDS) will be followed, when necessary.

SKIN AND EYE: Use copious amounts of soap and water from eye-wash kits and portable hand wash stations.

CONTACT: Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Skin shall also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs. Affected items of clothing shall also be removed from contact with skin.

Providing wash water and soap will be the responsibility of each individual contractor or subcontractor on-site.

16.12 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or omitted. The HSO or designee will accompany contaminated victims to the medical facility to advice on matters involving decontamination when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

16.13 Adverse Weather Conditions

In the event of adverse weather conditions, the HSO will determine if work will continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds).
- Limited visibility (fog).
- Potential for electrical storms.
- Earthquakes.
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The HSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

16.14 Spill Control and Response

All small spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining proper waste characterization and the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. All spill containment materials will be properly disposed. An exclusion zone of 50 to 100 feet around the spill area should be established depending on the size of the spill.

All contractor vehicles shall have spill kits on them with enough material to contain and absorb the worst-case spill from that vehicle. All vehicles and equipment shall be inspected prior to be admitted on site. Any vehicle or piece of equipment that develops a leak will be taken out of service and removed from the job site.

The following seven steps shall be taken by the Emergency Coordinator:

1. Determine the nature, identity and amounts of major spills.
2. Make sure all unnecessary persons are removed from the spill area.
3. Notify the HSO immediately.
4. Use proper PPE in consultation with the HSO.

5. If a flammable liquid, gas or vapor is involved, remove all ignition sources and use non-sparking and/or explosion-proof equipment to contain or clean up the spill (diesel-only vehicles, air-operated pumps, etc.)
6. If possible, try to stop the leak with appropriate material.
7. Remove all surrounding materials that can react or compound with the spill.

In addition to the spill control and response procedures described in this HASP, Langan personnel will coordinate with the designated project manager relative to spill response and control actions. Notification to the Project Manager must be immediate and, to the extent possible, include the following information:

- Time and location of the spill.
- Type and nature of the material spilled.
- Amount spilled.
- Whether the spill has affected or has a potential to affect a waterway or sewer.
- A brief description of affected areas/equipment.
- Whether the spill has been contained.
- Expected time of cleanup completion. If spill cleanup cannot be handled by Langan's on-site personnel alone, such fact must be conveyed to the Project Manager immediately.

Langan shall not make any notification of spills to outside agencies. The client will notify regulatory agencies as per their reporting procedures.

16.15 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on site:

- Industrial first aid kit.
- Fire extinguishers (one per site).

16.16 Restoration and Salvage

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers.
- Refilling medical supplies.
- Recharging eyewashes and/or showers.
- Replenishing spill control supplies.

16.17 Documentation

Immediately following an incident or near miss, unless emergency medical treatment is required, either the employee or a coworker must contact the Langan Incident/Injury Hotline at 1-(800)-9-LANGAN (ext. #4699) and the client representative to report the incident or near miss. For emergencies involving personnel injury and/or exposure, the HSO and affected employee will complete and submit an Employee Exposure/Injury Incident Report (Attachment C) to the Langan Corporate Health and Safety Manager as soon as possible following the incident.

17.0 SPECIAL CONDITIONS

This guideline contains information and requirements for special conditions that may not be routinely encountered.

17.1 Scope

The guideline applies to the specific projects identified within this document. Additional provisions will be addressed in each Site-Specific Health and Safety Plan (HASP), as needed.

17.2 Responsibilities

Site Personnel - All site personnel must be alert to safety hazards on work sites and take action to minimize such hazards. Personnel must utilize the buddy system, watch for inappropriate behavior, and be alert to changes in site conditions.

Health and Safety Officer (HSO) - The HSO is responsible for considering these procedures in the development of site specific HASPs. The HSO shall schedule frequent "tail gate" safety briefings to enhance safety awareness and discuss potential problems.

17.3 Procedures

The procedures outlined below shall be followed when such conditions are encountered.

17.3.1 Ladders

Langan safety procedures shall be used to ensure employee safety when using ladders in the office or work sites. All ladders shall be coated or repaired to prevent injury to the employee from punctures or lacerations and to prevent snagging or clothing. Any wood ladders used must have an opaque covering except for identification or warning labels, which may be placed on one face only of a side rail.

17.3.1.1 Ladder Use

Employees shall only use ladders for the purposes, which they were designed and shall not be used as scaffolding. Ladders will be maintained and inspected prior to use for slip hazards including oil and grease. Employees shall use ladders only on stable and level surfaces unless the ladder is secured to prevent possible displacement. Ladders should not be used on slippery surfaces unless secured or provided with slip resistant feet to prevent accidental displacement. Ladders should not be used in locations where they could be displaced by workplace activities or traffic. Ladder rungs, cleats and steps shall be parallel, level and uniformly spaced when the ladder is in the use position.

Employees should not be carrying anything including equipment that could cause injury if there was a fall while utilizing the ladder. The top and bottom of the ladder area must remain clear while in use. When ascending and descending the ladder, employees must face the ladder.

Ladders shall not be loaded beyond the maximum intended load for which they were built or the manufacturer's rated capacity.

17.3.1.2 Portable Ladders

Rungs, cleats and steps for portable ladders and fixed ladders shall be spaced not less than 10 inches apart, nor more than 14 inches apart, as measured between center lines of the rungs, cleats and steps. When used to access an upper landing surface, the ladder side rails must extend at least three feet above the upper landing surface to which the ladder is used to gain access. If this is not possible, due to the ladders length, then the top of the ladder shall be secured at its top to a rigid support.

17.3.1.3 Step Stools

Rungs, cleats and steps of step stools shall not be less than 8 inches apart, nor more than 12 inches apart, as measured between center lines of the rungs, cleats and steps.

17.3.1.4 Extension Ladders

Rungs, cleats and steps of the base section of extension trestle ladders shall be spaced not less than 8 inches apart, nor more than 18 inches apart, as measured between center lines of the rungs, cleats and steps. The rung spacing on the extension section of the extension trestle ladder shall not be less than 6 inches nor more than 12 inches, as measured between center lines of the rungs, cleats and steps. Ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

17.3.1.5 Inspection

Ladders will be inspected for visible detects periodically, prior to utilization or after any occurrence that could have negatively affected the ladder. Portable ladders with defects including broken or missing rungs, cleats, or steps, broken or split rails, corroded components or other faulty or defective components shall not be used. The ladder will be immediately marked as defective, tagged as "Do Not Use" or blocked from being used and removed from service until repaired.

17.3.2 First Aid/Cardiopulmonary Resuscitation (CPR)

Langan field and office personnel will be encouraged to be trained in First Aid and Cardiopulmonary Resuscitation (CPR). Training will be provided free of charge by Langan to all employees. Employees will receive a training certificate that will be kept on file with the Health & Safety Coordinator (HSC). Training and certification will be provided by a credited provider such as American Red Cross or equivalent.

17.3.2.1 Emergency Procedures

Prior to work at sites the Langan employees certified in first aid and CPR will be identified in the site specific HASP. Langan will endear to have at least one employee at a job site trained and able to render first aid and CPR. The site specific HASP will contain first aid information on both potential chemical and physical hazards. Emergency procedures to be followed are in case of injury or illnesses are provided in the HASP. The HASP will include emergency contact information including local police and fire departments, hospital emergency rooms, ambulance services, on-site medical personnel and physicians. The HASP will also include directions and contact information to the nearest emergency facility in case immediate medical attention is required. The emergency contact information will be conspicuously posted at the worksite. Employees that are injured and require immediate medical attention shall call either 911 or the local posted emergency contacts. Employees should use ambulatory services to transport injured workers to the nearest facility for emergency medical care. In areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances shall be conspicuously posted.

17.3.2.2 First Aid Supplies

First aid supplies are readily available to all Langan employees when required. First aid kits are located in each Langan office. Portable first aid kits are available for employees to use at work sites. First aid kits should consist of items needed to treat employees for potential chemical and physical injuries. At a minimum, first aid kits should contain items to allow basic first aid to be rendered. Where the eyes or body of an employee may be exposed to corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use including eye wash.

First aid kits will be weatherproof with individual sealed packages of each item. All portable first aid kits shall be inspected by Langan employees before and after use to ensure all used items are replaced. When out in the field, employees shall check first aid kits weekly to ensure used items are replaced.

17.3.3 Hydrogen Sulfide

Langan employees with the potential to be exposed to hydrogen sulfide while at work sites shall have training in hydrogen sulfide awareness. The training will include identification of areas where employees could be exposed to hydrogen sulfide, health effects, permissible exposure limits, first aid procedures and personnel protective equipment. Langan employees could be exposed to hydrogen sulfide while at job sites including petroleum refineries, hazardous waste treatment, storage and disposal facilities, uncontrolled hazardous waste sites and remediation projects.

17.3.3.1 Characteristics

Hydrogen sulfide is a colorless gas with a strong odor of rotten eggs that is soluble in water. Hydrogen sulfide is used to test and make other chemicals. It is also found as a by-product of chemical reactions, such as in sewer treatment. It is a highly flammable gas and a dangerous fire hazard. Poisonous gases are produced in fires including sulfur oxides. Hydrogen sulfide is not listed as a carcinogen.

17.3.3.2 Health Effects

Hydrogen Sulfide can affect employees if inhaled or through contact with skin or eyes. Acute (or short term) health effects of hydrogen sulfide exposure include irritation of the nose and throat, dizziness, confusion, headache and trouble sleeping. Inhalation of hydrogen sulfide can irritate the lungs causing coughing and/or shortness of breath. Higher levels of exposure can cause build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.

Chronic (or long term) health effects of low levels of exposure to hydrogen sulfide can cause pain and redness of the eyes with blurred vision. Repeated exposure may cause bronchitis with cough, phlegm and shortness of breath.

17.3.3.3 Protective Clothing and Equipment

Respirators are required for those operations in which employees will be exposed to hydrogen sulfide above OSHA permissible exposure level. The maximum OSHA permissible exposure limit (PEL) for hydrogen sulfide is 20 parts of hydrogen sulfide vapor per million parts of air (20 ppm) for an 8-hour workday and the maximum short-term exposure limit (STEL) is 10 ppm for any 10-minute period.

Where employees are exposed to levels up to 100 parts of hydrogen sulfide vapor per million parts of air (100 ppm), the following types of respiratory protection are allowed:

- Any powered, air purifying respirator with cartridge(s);
- Any air purifying, full-facepiece respirator (gas mask) with a chin style, front- or back-mounted canister;
- Any supplied air system with escape self-contained breathing apparatus, if applicable; and,
- Any self-contained breathing apparatus with a full facepiece.

Respirators used by employees must have joint Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) seal of approval. Cartridges or canisters must be replaced before the end of their service life, or the end of the shift, whichever occurs first. Langan employees that have the potential to be exposed to hydrogen sulfide will be trained in the proper use of respirators. Respirator training is discussed under– Langan's Respiratory Protection Program.

Employees with potential exposure to hydrogen sulfide, or when required by the client, will wear a portable hydrogen sulfide gas detector. The detector should have an audible, visual and vibrating alarm. The detector may also provide detection for carbon monoxide, sulfur dioxide and oxygen deficient atmospheres. The hydrogen sulfide monitor will, at a minimum, be calibrated to detect hydrogen sulfide at a level of 20 parts of hydrogen sulfide vapor per million parts of air (20 ppm). Many portable gas detectors will have factory defaults with a low level alarm at 10 ppm and a high level alarm at 15 ppm. Langan employees shall consult clients to determine if any site specific threshold levels exist.

If the hydrogen sulfide gas detector sounds and employees are not wearing appropriate respiratory protection, employees must immediately vacate the area and meet at the assigned emergency location. Langan employees may not re- enter the site without proper respiratory protection and approval from the client or property owner, if needed.

Employees shall wear PPE to prevent eye and skin contact with hydrogen sulfide. Employees must wear appropriate protective clothing including boots, gloves, sleeves and aprons, over any parts of their body that could be exposed to hydrogen sulfide. Non-vented, impact resistant goggles should be worn when working with or exposed to hydrogen sulfide.

17.3.3.4 Emergency and First Aid Procedures

<u>Eye and Face Exposure</u>

If hydrogen sulfide comes in contact with eyes, it should be washed out immediately with large amounts of water for 30 minutes, occasionally lifting the lower and upper eye lids. Seek medical attention immediately.

Skin Exposure

If hydrogen sulfide contaminates clothing or skin, remove the contaminated clothing immediately and wash the exposed skin with large amounts of water and soap. Seek medical attention immediately. Contaminated clothing should either be disposed of or washed before wearing again.

Breathing

If a Langan employee or other personnel breathe in hydrogen sulfide, immediately get the exposed person to fresh air. If breathing has stopped, artificial respiration should be started. Call for medical assistance or a doctor as soon as possible.

Safety Precautions

Hydrogen sulfide is a highly flammable gas and a dangerous fire hazard. Containers of hydrogen sulfide may explode in a fire situation. Poisonous gases are produced during fires.

Langan employees should contact property owners and operators prior to conducting work onsite to be aware of any site specific contingency plans, identify where hydrogen sulfide is used at the facility and be informed about additional safety rules or procedures.

19.3.4 Fire Protection/Extinguishers

Langan field personnel that have been provided with portable fire extinguishers for use at worksites will be trained to familiarize employees with general principles of fire extinguisher use and hazards associated with the incipient stage of firefighting. Training will be provided prior to initial assignment for field work and annually thereafter.

Portable fire extinguishers shall be visually inspected monthly and subjected to an annual maintenance check. Langan shall retain records of the annual maintenance date.

17.3.5 Overhead lines

When field work is performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before the work shall commence. If overhead lines are to be deenergized, arrangements shall be made with the client, property owner or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

When unqualified Langan personnel are working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object they may contact cannot come closer to any unguarded, energized overhead line than the following distances:

1. For voltages to ground 50kV or below - 10 feet; and
2. For voltages to ground over 50kV - 10 feet, plus 4 inches for every 10kV over 50kV.

As previously indicated, Langan does not retain qualified employees to perform work on energized equipment.

17.3.5.1 Vehicle and Equipment Clearance

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 feet is maintained. If the voltage of the overhead lines is higher than 50kV, the clearance shall be increased 4 inches for every 10kV over that voltage.

If any of the following discussed conditions occur, the clearance may be reduced.

- If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10 kV over that voltage.
- If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless the employee is using protective equipment rated for the voltage; or the equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the overhead line than permitted.

If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

17.3.6 Trade Secret

Langan employees could potentially be provided trade secret information by the client or property owner when site specific information is provided about highly hazardous chemicals. Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Langan employees understand that this information should be kept confident and if required, may enter into a confidentially agreement with the client.

17.3.7 Bloodborne Pathogens

Langan employees that can reasonably anticipate exposure to blood or other potentially infectious material while at work sites shall have training in bloodborne pathogens. Applicable employees would include those trained in first aid and serving a designated role as an emergency medical care provider. Bloodborne pathogens are pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus and human immunodeficiency virus.

17.3.7.1 Training

Langan employees with potential occupational exposure to blood or other potentially infectious material must participate in a training program. Training must be conducted prior to initial assignment where there would be potential for exposure and annually thereafter within one year of previous training. The training program will be provided to Langan employees at no cost to them and during working hours.

Langan will ensure the training program shall consist of the following:

- An accessible copy of the regulatory text of 29 CFR 1910.1030 and an explanation of its contents;
- A general explanation of the epidemiology and symptoms of bloodborne diseases;
- An explanation of the modes of transmission of bloodborne pathogens;
- An explanation of Langan's exposure control plan and the means by which the employee can obtain a copy of the written plan;
- An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;
- An explanation of the use and limitations of personal protective
    - equipment (PPE) to prevent and reduce exposure;

- o Information on the types, proper use, location, removal, handling and disposal of PPE;
- o An explanation of the basis for selection of PPE;
- o Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;
- o Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
- o An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;
- o Information on the post-exposure evaluation and follow-up that the
- o employer is required to provide for the employee following an exposure incident;
- o An explanation of the signs and labels and/or color coding required by paragraph 29 CFR 1910.1030(g)(1); and
- o An opportunity for interactive questions and answers with the person conducting the training session.

Langan will develop and implement a written Exposure Control Plan, which will be designed to eliminate or minimize employee exposure to bloodborne pathogens. The Exposure Control Plan will contain the following elements:

- An exposure determination for employees;
- The schedule and method of implementation for Methods of Compliance (29 CFR 191.1030(d)), Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up (29 CFR 1910.1030(f)), Communication of Hazards to Employees (29 CFR 1910.1030(g)) and (h) Recordkeeping (29 CFR 1910.1030(h));
- The procedure for the evaluation of circumstances surrounding exposure incidents;
- Ensure a copy of the Exposure Control Plan will be accessible to employees; and,
- The Exposure Control Plan shall be reviewed and updated at least annually.

Langan employees with occupational exposure to bloodborne pathogens include any employees trained in first aid that would be expected to provide emergency medical care. This determination is made without regards to the use of PPE, which could eliminate or minimize exposure.

Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for bloodborne pathogens. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

Work practice controls shall be used to eliminate or minimize employee exposure, if applicable.

Since Langan employees will have occupational exposure only during rendering of first aid, personnel protective equipment will be utilized to reduce or minimize exposure. PPE that could be available to Langan personnel when administering first aid includes safety glasses, gloves, and Tyvek suits or sleeves. PPE and first aid kits will be provided to employees at no cost to them.

Langan employees that render first aid in office areas will have access to hand washing facilities or restrooms. For first aid rendered at field locations, first aid kits will contain an appropriate antiseptic hand cleanser and clean cloth/paper towels or antiseptic towelettes. After using antiseptic hand cleansers or towelettes, employees shall wash their hands with soap and running water as soon as feasible.

After administering first aid, potentially infectious materials, including towels, personnel protective equipment, clothes and bandages, shall be placed in a container, which prevents leakage during collection, handling, processing, storage, transport, or shipping. All PPE will be dispose of after use. Any equipment or working surfaces which was been exposed to blood or potentially infectious materials due to an injury, will be decontaminated prior to reuse.

Langan will make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation and follow-up to all employees who have had an exposure incident. These services will be available to the employee at no cost to them through a medical provider.

17.3.7.2 Recordkeeping

Langan will maintain training and medical records for each employee with occupational exposure to blood or potentially infectious materials. Medical and training records will be maintained by Langan's H&S Department.

Training records will include the following:

- Dates of the training sessions;
- Contents or a summary of the training sessions;
- Names and qualifications of persons conducting the training; and
- Names and job titles of all persons attending the training sessions.

Training records shall be maintained for 3 years from the date on which the training occurred. Medical records will be will be preserved and maintained for the duration of employment plus 30 years.

All records will be made available upon request to employees, the Assistant Secretary of Labor for Occupational Safety and Health, and Director of National Institute for Occupational Safety and Health Director of OSHA for examination and copying. Medical records must have written consent from employee before releasing.

If Langan ceases to do business, all records shall be transferred to the successor employer. The successor employer shall receive and maintain these records.

If there will not be a successor, Langan will notify current employees of their rights to access records at least three months prior to the cessation of business.

18.0 RECORDKEEPING

The following is a summary of required health and safety logs, reports and recordkeeping.

18.1 Field Change Authorization Request

Any changes to the work to be performed that is not included in the HASP will require an addendum that is approved by the Langan project manager and Langan HSM to be prepared. Approved changes will be reviewed with all field personnel at a safety briefing.

18.2 Medical and Training Records

Copies or verification of training (40-hour, 8-hour, supervisor, site-specific training, documentation of three-day OJT, and respirator fit-test records) and medical clearance for site work and respirator use will be maintained in the office and available upon request. Records for all subcontractor employees must also be available upon request. All employee medical records will be maintained by the HSM.

18.3 Onsite Log

A log of personnel on site each day will be kept by the HSO or designee.

18.4 Daily Safety Meetings (“Tailgate Talks”)

Completed safety briefing forms will be maintained by the HSO.

18.5 Exposure Records

All personal monitoring results, laboratory reports, calculations and air sampling data sheets are part of an employee exposure record. These records will be maintained by the HSO during site work. At the end of the project they will be maintained according to 29 CFR 1910.1020.

18.6 Hazard Communication Program/MSDS-SDS

Material safety data sheets (MSDS) of Safety Data Sheets (SDS) have been obtained for applicable substances and are included in this HASP (Attachment D). Langan's written hazard communication program, in compliance with 29 CFR 1910.1200, is maintained by the HSM.

18.7 Documentation

Immediately following an incident or near miss, unless emergency medical treatment is required, either the employee or a coworker must contact the Langan incident/injury hotline at 1-800-952-6426, extension 4699 and the Project Manager to report the incident or near miss. The Project Manager will contact the client or client representative. A written report must be completed and submitted HSM within 24 hours of the incident. For emergencies involving personnel injury and/or exposure, employee will complete and submit the Langan incident/injury report to the Langan corporate health and safety manager as soon as possible following the incident. Accidents will be investigated in-depth to identify all causes and to recommend hazard control measures.

18.7.1 Accident and Injury Report Forms

18.7.1.1 Accident/Incident Report

All injuries, no matter how slight, shall be reported to the FTL and the PM immediately. The accident/incident report forms, attached in Attachment U and Attachment V will be filled out on all accidents by the applicable contractor supervision personnel, the FTL, or the HSO. Copies of all accident/incident reports shall be kept on-site and available for review. Project personnel will be instructed on the location of the first aid station, hospital, and doctor and ambulance service near the job. The emergency telephone numbers will be conspicuously posted in site vehicles near the work zone. First aid supplies will be centrally located and conspicuously posted between restricted and non-restricted areas to be readily accessible to all on the site.

18.7.1.2 First Aid Treatment Record

The forms in will be used for recording all non-lost time injuries treated by the project first-aid attendant, the local physician or hospital will be entered in detail on this record. "Minor" treatment of scratches, cuts, etc. will receive the same recording attention as treatment of more severe injuries.

18.7.1.3 OSHA Form 300

An OSHA Form 300 will be kept at the Langan Corporate Office in Parsippany, New Jersey. All recordable injuries or illnesses will be recorded on this form. Subcontractor employers must also meet the requirements of maintaining an OSHA 300 form. The Incident Report form used to capture the details of work-related injuries/illnesses meets the requirements of the OSHA Form 301 (supplemental record) and must be maintained with the OSHA Form 300 for all recordable injuries or illnesses. Forms for recording OSHA work-related injuries and illnesses are included in Attachment U and Attachment V.

19.0 CONFINED SPACE ENTRY

Confined spaces are not anticipated at the Site during planned construction activities. If confined spaces are identified, the contractor must implement their own confined space program that all applicable federal, state and local regulations. Confined spaces **will not** be entered by Langan personnel.

20.0 HASP ACKNOWLEDGEMENT FORM

All Langan personnel and contractors will sign this HASP Compliance Agreement indicating that they have become familiar with this HASP and that they understand it and agree to abide by it.

Printed Name	Signature	Company	Date

Printed Name	Signature	Company	Date

Printed Name	Signature	Company	Date

Printed Name	Signature	Company	Date

Printed Name	Signature	Company	Date

Printed Name	Signature	Company	Date

TABLES

TABLE 1
TASK HAZARD ANALYSES

Task	Hazard	Description	Control Measures	First Aid
1.3.1 – 1.3.14	Contaminated Soil or Groundwater-Dermal Contact	Contaminated water spills on skin, splashes in eyes; contact with contaminated soil/fill during construction activities or sampling.	Wear proper PPE; follow safe practices, maintain safe distance from construction activities	See Table 2, seek medical attention as required
1.3.1 – 1.3.14	Lacerations, abrasions, punctures	Cutting bailer twine, pump tubing, acetate liners, etc. with knife; cuts from sharp site objects or previously cut piles, tanks, etc.; Using tools in tight spaces	Wear proper PPE; follow safe practices	Clean wound, apply pressure and/or bandages; seek medical attention as required.
1.3.1 – 1.3.14	Contaminated Media Inhalation	Opening drums, tanks, wells; vapors for non-aqueous phase liquids or other contaminated site media; dust inhalation during excavation; vapor accumulation in excavation	Follow air monitoring plan; have quick access to respirator, do not move or open unlabeled drums found at the site, maintain safe distance from construction activities	See Table 2, seek medical attention as required
1.3.1 – 1.3.14	Lifting	Improper lifting/carrying of equipment and materials causing strains	Follow safe lifting techniques; Langan employees are not to carry contractor equipment or materials	Rest, ice, compression, elevation; seek medical attention as required
1.3.1 – 1.3.14	Slips, trips, and falls	Slips, trips and falls due to uneven surfaces, cords, steep slopes, debris and equipment in work areas	Good housekeeping at site; constant awareness and focus on the task; avoid climbing on stockpiles; maintain safe distance from construction activities and excavations; avoid elevated areas over six feet unless fully accredited in fall protection and wearing an approved fall protection safety apparatus	Rest, ice, compression, elevation; seek medical attention as required
1.3.1 – 1.3.14	Noise	Excavation equipment, hand tools, drilling equipment.	Wear hearing protection; maintain safe distance from construction activities	Seek medical attention as required
1.3.1 – 1.3.14	Falling objects	Soil material, tools, etc. dropping from drill rigs, front-end loaders, etc.	Hard hats to be worn at all times while in work zones; maintain safe distance from construction activities and excavations	Seek medical attention as required
1.3.1 – 1.3.14	Underground/ overhead utilities	Excavation equipment, drill rig auger makes contact with underground object; boom touches overhead utility	"One Call" before dig; follow safe practices; confirm utility locations with contractor; wear proper PPE; maintain safe distance from construction activities and excavations	Seek medical attention as required
1.3.1 – 1.3.14	Insects (bees, wasps, hornet, mosquitoes, and spider)	Sings, bites	Insect Repellent; wear proper protective clothing (work boots, socks and light colored pants);field personnel who may have insect allergies (e.g., bee sting) should provide this information to the HSO or FSO prior to commencing work, and will have allergy medication on site.	Seek medical attention as required
1.3.1 – 1.3.14	Vehicle traffic / Heavy Equipment Operation	Vehicles unable to see workers on site, operation of heavy equipment in tight spaces, equipment failure, malfunctioning alarms	Wear proper PPE, especially visibility vest; use a buddy system to look for traffic; rope off area of work with cones and caution tape or devices at points of hazard, maintain safe distance from construction activities and equipment	Seek medical attention as required

TABLE 2
CONTAMINANT HAZARDS OF CONCERN

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	1,1′-Biphenyl Biphenyl Phenyl benzene Diphenyl	92-52-4	None	1 mg/m^3 100 mg/m^3	Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, throat; headache, nausea, lassitude (weakness, exhaustion), numb limbs; liver damage	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	1,1-Dichloroethane Asymmetrical dichloroethane Ethylidene chloride 1,1-Ethylidene dichloride 1,1-DCA	75-34-3	PID	100 ppm 3000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the skin; central nervous system depression; liver, kidney, lung damage	Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	1,2,4,5-Tetramethylbenzene	95-93-2	NA	None None	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	1,2,4-Trichlorobenzene Unsym-Trichlorobenzene 1,2,4-Trichlorobenzol	120-82-1	NA	None None	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin, mucous membrane; In Animals: liver, kidney damage; possible teratogenic effects	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	1,2,4-Trimethylbenzene	95-63-6	PID	None None	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	1,3,5-Trimethylbenzene Mesitylene sym-Trimethylbenzene	108-67-8	PID	None None	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	1,3-Dichlorobenzene m-Dichlorobenzol; m-Phenylene dichloride m-dichlorobenzene	541-73-1	PID	None None	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	2,2,4-Trimethylpentane	540-84-1	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	2,4-Dimethylphenol 2,4-Xylenol m-Xylenol 1-Hydroxy-2,4-dimethylbenzene 2,4-Dimethylphenol 4-Hydroxy-1,3-dimethylbenzene 4,6-Dimethylphenol 1,3-Dimethyl-4-hydroxybenze	105-67-9	None	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; headache, narcosis, coma; dermatitis; in animals: liver, kidney damage	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	2-Butanone Ethyl methyl ketone MEK Methyl acetone Methyl ethyl ketone	78-93-3	PID	200 ppm 3000 ppm	Soil Groundwater Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eye: Irrigate immediately Skin: Water wash immediately Breathing: Fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.14	2-Hexanone Butyl methyl ketone MBK Methyl butyl ketone Methyl n-butyl ketone	591-78-6	PID	100 ppm 1600 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose; peripheral neuropathy: lassitude (weakness, exhaustion), paresthesia; dermatitis; headache, drowsiness	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	2-Methylnaphthalene β-methylnaphthalene	91-57-6	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion or skin absorption, eye contact	irritation to the skin, eyes, mucous membranes and upper respiratory tract. It may also cause headaches, nausea, vomiting, diarrhea, anemia, jaundice, euphoria, dermatitis, visual disturbances, convulsions and comatose	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	2-Vinyl-2,3-dihydrobenzofuran	NA	NA	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	Irritant to eyes, skin, mucous membranes and respiratory system. May be harmful by ingestion, skin absorption and inhalation	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	4,4'-DDD Dichlorodiphenyldichloroethane 1,1'-(2,2-Dichloroethylidene)bis (4-chlorobenzene)	72-54-8	None	NA NA	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	4-Isopropyltoulene 1-Methyl-4-(1-methylethyl)benzene 4-Isopropyltoluene; 4-Methylcumene; 1-Methyl-4-isopropylbenzene Dolcymene Camphogen Paracymene Cymene p-Cymene p-Isopropyltoluene	99-87-6	PID	NA NA	Soil Groundwater Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Acenaphthene 1,2-Dihydroacenaphthylene 1,8-Ethylenenaphthalene peri-Ethylenenaphthalene Naphthyleneethylene Tricyclododecapentaene	83-32-9	PID	NA NA	Soil	inhalation, ingestion, skin and/or eye contact,	irritation to the skin, eyes, mucous membranes and upper respiratory tract; If ingested, it can cause vomiting	Eye: Irrigate immediately Skin: Soap wash immediately, if redness or irritation develop, seek medical attention immediately Breathing: Move to fresh air Swallow: do not induce vomiting, seek medical attention immediately
1.3.1 – 1.3.14	Acenaphthylene Cycopental(de)naphthalene, Acenaphthalene	208-96-8	PID	NA NA	Soil	inhalation, ingestion, skin and/or eye contact	irritation to the skin, eyes, mucous membranes and upper respiratory tract	Eye: Irrigate immediately, seek medical attention immediately, Skin: Soap wash immediately, if redness or irritation develop, seek medical attention immediately Breathing: Move to fresh air Swallow: do not induce vomiting, seek medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Acetone Dimethyl ketone Ketone propane 2-Propanone	67-64-1	PID	1000 ppm 2500 ppm	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Aldrin 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-endo-1,4-exo-5,8-dimethanonaphthalene HHDN Octalene	309-00-2	PID	0.25 ppm 5 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort); myoclonic jerks of limbs; clonic, tonic convulsions; coma; hematuria (blood in the urine), azotemia; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Aluminum	7429-90-5	None	0.5 mg/m3 50 mg/m3	Soil	inhalation, skin and/or eye contact	irritation to the eyes, skin, respiratory system	Eye: Irrigate immediately Breathing: Fresh air
1.3.1 – 1.3.14	Anthracene	120-12-7	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to the skin, eyes, mucous membranes and upper respiratory tract, abdominal pain if ingested.	Eye: Irrigate immediately, seek medical attention immediately, Skin: Soap wash immediately, Breathing: Move to fresh air, refer to medical attention; Swallow: refer to medical attention

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Antimony	7440-36-0	None	0.5 mg/m^3 50 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation skin, possible dermatitis; resp distress; diarrhea; muscle tremor, convulsions; possible gastrointestinal tract	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Aroclor 1242	53469-21-9	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Aroclor 1248	12672-26-6	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Aroclor 1254	11097-69-1	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Aroclor 1260	11096-82-5	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Aroclor 1268	11100-14-4	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Arsenic	NA	None	0.5 mg/m^3 NA	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation skin, possible dermatitis; resp distress; diarrhea; muscle tremor, convulsions; possible gastrointestinal tract	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Barium	10022-31-8	None	0.5 mg/m^3 50 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Benzene Benzol Phenyl hydride	71-43-2	PID	3.19 mg/m^3 1,595 mg/mg^3	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; lassitude (weakness, exhaustion) [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Benzo(a)anthracene Benzanthracene Benzanthrene 1,2-Benzanthracene Benzo[b]phenanthrene Tetraphene	56-55-3	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	dermatitis, bronchitis, [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Benzo(a)pyrene	50-32-8	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	dermatitis, bronchitis, [potential occupational carcinogen]	Eye: Irrigate immediately, seek medical attention Skin: Soap wash immediately; Breathing: move to fresh air; Swallow: Induce vomiting if conscious, seek medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Benzo(b)fluoranthene	205-99-2	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.14	Benzo(g,h,i)perylene Benzo(ghi)perylene	191-24-2	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	NA	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.14	Benzo(k)fluoranthene	207-08-9	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation (dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid	
1.3.1 – 1.3.14	Beryllium	7440-41-7	None	0.002 mg/m^3 4 mg/m^3	Soil	inhalation, skin and/or eye contact	berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation to the eyes; dermatitis; [potential occupational carcinogen]	Eye: Irrigate immediately Breathing: Fresh air	
1.3.1 – 1.3.14	Beta-Endosulfan Beta Endosulfan Endosulfan II (beta) Endosulfan II	33213-65-9	None	None	NA NA	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation skin; nausea, confusion, agitation, flushing, dry mouth, tremor, convulsions, headache; in animals: kidney, liver injury; decreased testis weight	Eye: imme Skin: imme Breat Resp supp Swal atten imme
1.3.1 – 1.3.14	Bis(2-ethylhexyl)phthalate Di-sec octyl phthalate DEHP Di(2-ethylhexyl)phthalate Octyl phthalate	117-81-7	None	5 mg/m^3 5000 mg/m^3	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, mucous membrane; in animals: liver damage; teratogenic effects; [potential occupational carcinogen	Eye: Irrigate immediately Breathing: Respiratory support Swallow: Medical attention immediately	

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Cadmium	7440-43-9	None	0.005 mg/m^3 9 mg/m^3	Soil	inhalation, ingestion	pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Calcium	7440-70-2	None	NA	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, upper resp tract; ulcer, perforation nasal septum; pneumonitis; dermatitis	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Carbazole 9-azafluorene Dibenzopyrrole Diphenylenimine diphenyleneimide	86-74-8	None	NA NA	Soil	inhalation, skin absorption (liquid), skin and/or eye contact	irritation to eyes and skin, respiratory irritation	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Carbon disulfide	75-15-0	PID	20 ppm 500 ppm	Soil Groundwater Vapor	inhalation, skin or eye contact, ingestion	irritation to the eyes, skin, respiratory system	Eye: Irrigate immediately (liquid) Skin: Water flush immediately (liquid) Breathing: Respiratory support
1.3.1 – 1.3.14	Chlorobenzene benzene chloride monochlorobenzene Phenyl chloride Chlorobenzol MCB	108-90-7	PID	75 ppm 1000 ppm	Groundwater Soil Vapor	inhalation, skin or eye contact, ingestion	irritation to the eyes, skin, nose; drowsiness, incoordination; central nervous system depression; in animals: liver, lung, kidney injury	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Chloroform Methane trichloride Trichloromethane	67-66-3	None	50 ppm 500 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Chromium	7440-47-3	None	1.0 mg/m^3 250 mg/m^3	Groundwater Soil	inhalation absorption ingestion	irritation to eye, skin, and respiratory	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Chrysene Benzo[a]phenanthrene 1,2-Benzphenanthrene	218-01-9	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Groundwater Soil	inhalation, absorption, ingestion, consumption	irritation to eye, skin, and respiratory, gastrointestinal irritation nausea, vomit, diarrhea [potential occupational carcinogen]	Eyes: Irrigate immediately Skin: Soap wash promptly. Breath: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	cis-1,2-Dichloroethene	156-59-2	PID	200 ppm 1000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, respiratory system; central nervous system depression	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Cis-Chlordane a-Chlordane alpha Chlordane cis-Chlordan CIS-CHLORDANE Chlordane cis-;Chlordane cis;ALPHA-CHLORDAN Chlordan, cis-ALPHA-CHLORDANE alpha(cis)-chlordane α-chlordane solution	5102-71-9	None	0.5 mg/m^3 100 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	Blurred vision; confusion; ataxia, delirium; cough; abdominal pain, nausea, vomiting, diarrhea; irritability, tremor, convulsions; anuria	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Cobalt	7440-48-4	None	0.1mg/m^3 20 mg/m^3	Soil	inhalation, ingestion, skin and/or eye contact	Cough, dyspnea (breathing difficulty), wheezing, decreased pulmonary function; weight loss; dermatitis; diffuse nodular fibrosis; resp hypersensitivity, asthma	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Copper	7440-50-8	None	1.0 mg/m^3 100 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose, metallic taste; dermatitis; anemia	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Cumene Cumol Isopropylbenzene 2-Phenyl propane	98-82-8	PID	50 ppm 900 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Cyanide	57-12-5	None	5 mg/m^3 25 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	Exposure to cyanide can cause weakness, headaches, confusion, dizziness, fatigue, anxiety, sleepiness, nausea and vomiting. Breathing can speed up then become slow and gasping. Coma and convulsions also occur. If large amounts of cyanide have been absorbed by the body, the person usually collapses and death can occur very quickly. Long-term exposure to lower levels of cyanide can cause skin and nose irritation, itching, rashes and thyroid changes.	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Cyclohexane Benzene hexahydride Hexahydrobenzene Hexamethylene Hexanaphthene	110-82-7	PID	300 ppm 1300 ppm	Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, respiratory system; drowsiness; dermatitis; narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	DDE 4,4-DDE 1,1-bis-(4-chlorophenyl)-2,2-dichloroethene Dichlorodiphenyldichloroethylene	72-55-9	None	NA NA	Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	Oral ingestion of food is the primary source of exposure for the general population. Acute and chronic ingestion may cause nausea, vomiting, diarrhea, stomach pain, headache, dizziness, disorientation, tingling sensation, kidney damage, liver damage, convulsions, coma, and death. 4,4' DDE may cross the placenta and can be excreted in breast milk	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	DDT 4,4-DDT p,p'-DDT Dichlorodiphenyltrichloroethane 1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane	50-29-3	None	1 mg/m^3 500 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Dibenzo(a,h)anthracene	53-70-3	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Groundwater Soil	inhalation, absorption, ingestion, consumption	irritation to eyes, skin, respiratory, and digestion [potential occupational carcinogen]	Eyes: Irrigate immediately Skin: Soap wash promptly. Breath: Respiratory support PID Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Dibenzofuran	132-64-9	None	NA NA	Soil	inhalation, absorption	irritation to eyes, and skin	Eyes: Irrigate immediately Skin: Soap wash promptly.
1.3.1 – 1.3.14	Dibutyl phthalate Di-n-butyl phthalate Butyl phthalate n-Butyl phthalate 1,2-Benzenedicarboxylic acid dibutyl ester o-Benzenedicarboxylic acid dibutyl ester DBP Palatinol C, Elaol Dibutyl-1,2-benzene-dicarboxylate Di-n-butyl Phthalate Di-n-butylphthalate	84-74-2	None	5 mg/m^3 4000 mg/m^3	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, upper respiratory system, stomach	Eye: Irrigate immediately Skin: Wash regularly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Dichlorodifluoromethane Difluorodichloromethane, Fluorocarbon 12 Freon 12 Freon® 12 Genetron® 12 Halon® 122 Propellant 12 Refrigerant 12 Dichlorodifluromethane	75-71-8	None	1000 pp, 15,000 ppm	Groundwater Soil Vapor	inhalation, skin and/or eye contact (liquid)	dizziness, tremor, asphyxia, unconsciousness, cardiac arrhythmias, cardiac arrest; liquid: frostbite	Eye: Frostbite Skin: Frostbite Breathing: Respiratory support
1.3.1 – 1.3.14	Dieldrin HEOD 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo exo-5,8-dimethanonaphthalene	60-57-1	PID	0.25 mg/m^3 50 mg/m^3	Groundwater Soil Water	inhalation, skin absorption, ingestion, skin and/or eye contact	headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort), sweating; myoclonic limb jerks; clonic, tonic convulsions; coma; [potential occupational carcinogen]; in animals: liver, kidney damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Diesel Fuel automotive diesel fuel oil No. 2 distillate diesoline diesel oil diesel oil light diesel oil No. 1-D summer diesel	68334-30-5	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Endrin 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,endo-5,8-dimethanonaphthalene; Hexadrin	72-20-8	None	0.1 mg/m^3 2 mg/m^3	Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	epileptiform convulsions; stupor, headache, dizziness; abdominal discomfort, nausea, vomiting; insomnia; aggressiveness, confusion; drowsiness, lassitude (weakness, exhaustion); anorexia; in animals: liver damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Ethanol Absolute alcohol Alcohol cologne spirit drinking alcohol ethane monoxide ethylic alcohol EtOH ethyl alcohol ethyl hydrate ethyl hydroxide ethylol grain alcohol hydroxyethane methylcarbinol	64-17-5	PID	1000 ppm 3300 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose; headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; liver damage; anemia; reproductive, teratogenic effects	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Fresh air Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Ethyl acetate Acetic ester Acetic ether Ethyl ester of acetic acid Ethyl ethanoate	141-78-6	PID	400 ppm 2000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation eyes, skin, nose, throat; narcosis; dermatitis	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Ethyl benzene Ethylbenzene Ethylbenzol Phenylethane	100-40-4	PID	435 mg/m^3 3,472 mg/m^3	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Ethyl ether Diethyl ether Diethyl oxide Ethyl oxide Ether Solvent ether	60-29-7	PID	400 ppm 1900 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, upper respiratory system; dizziness, drowsiness, headache, excited, narcosis; nausea, vomiting	Eye: Irrigate immediately Skin: Water wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Ethylene dichloride 1,2-Dichloroethane Ethylene chloride Glycol dichloride 1,2-DCA	107-06-2	PID	1 ppm 50 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin absorption, skin and/or eye contact	irritation to the eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Fluoranthene Benzo(j, k)fluorene	206-44-0	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.14	Fluorene	86-73-7	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attenti
1.3.1 – 1.3.14	Fuel Oil No. 2	68476-30-2	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Gasoline	8006-61-9	PID	NA NA	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Helium	7440-59-7	Helium Detector	NA NA	NA	inhalation	dizziness, headache, and nausea	Breathing: Respiratory support
1.3.1 – 1.3.14	Heptachlor epoxide 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indene	1024-57-3	None	0.5 mg/m^3 35 mg/m^3	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	In animals: tremor, convulsions; liver damage; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Heptane n-Heptane	142-82-5	PID	500 ppm 750 ppm	Goundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	dizziness, stupor, incoordination; loss of appetite, nausea; dermatitis; chemical pneumonitis (aspiration liquid); unconsciousness	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Hexavalent Chromium Chromium VI	18540-29-9	None	1.0 mg/m^3 250 mg/m^3	Groundwater Soil	inhalation absorption ingestion	irritation to eye, skin, and respiratory	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Indeno(1,2,3-cd)pyrene	193-39-5	None	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Groundwater Soil	inhalation, absorption, ingestion, consumption	irritation to eyes, skin, respiratory, and digestion [potential occupational carcinogen]	Eyes: Irrigate immediately Skin: Soap wash promptly. Breath: Respiratory support Swallow: Medical attention immediately, wash mouth with water
1.3.1 – 1.3.14	Iron	7439-89-6	None	10 mg/m^3 NA	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; abdominal pain, diarrhea, vomiting	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Isophorone 1,1,3-Trimethyl-3-cyclohexene-5-one Isoforone Isoacetophorone	78-59-1	None	25 ppm 200 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, respiratory system	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Isopropyl alcohol Iso-Propyl Alcohol Carbinol IPA Isopropanol 2-Propanol sec-Propyl alcohol Rubbing alcohol Isopropylalcohol	67-63-0	PID	400 ppm 2000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; drowsiness, dizziness, headache; dry cracking skin; in animals: narcosis	Eye: Irrigate immediately Skin: Water flush Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Lead	7439-92-1	None	0.050 mg/m^3 100 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation to the eyes; hypertension	Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Magnesium	7439-95-4	None	15 mg/m^3 NA	Soil	inhalation, skin and/or eye contact	irritation to the eyes, skin, respiratory system; cough	Eye: Irrigate immediately Breathing: Fresh air
1.3.1 – 1.3.14	Manganese	7439-96-5	None	5 mg/m^3 500 mg/m^3	Groundwater Soil	inhalation, ingestion	aerosol is irritating to the respiratory tract	Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	m-Cresol 3-methylphenol meta-Cresol 3-Cresol m-Cresylic acid 1-Hydroxy-3-methylbenzene 3-Hydroxytoluene 3-Methylphenol	108-39-4	PID	5 ppm 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Mercury	7439-97-6	None	0.1 mg/m^3 10 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Methoxychlor p,p'-Dimethoxydiphenyltrichloroethane DMDT Methoxy-DDT 2,2-bis(p-Methoxyphenyl)-1,1,1-trichloroethane 1,1,1-Trichloro-2,2-bis-(p-methoxyphenyl)ethane	72-43-5	None	15 mg/m^3 5000 mg/m^3	Groundwater Soil Vapor	inhalation, ingestion	fasciculation, trembling, convulsions; kidney, liver damage; [potential occupational carcinogen]	Skin: Soap wash Breathing: Fresh air Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Methyl Acetate	79-20-9	PID	200 ppm 3100 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; headache, drowsiness; optic nerve atrophy; chest tightness; in animals: narcosis	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Methyl Bromide Bromomethane Monobromomethane	74-83-9	PID	20 ppm 250 ppm	Soil Groundwater Vapor	inhalation, skin absorption (liquid), skin and/or eye contact (liquid)	irritation to the eyes, skin, respiratory system; muscle weak, incoordination, visual disturbance, dizziness; nausea, vomiting, headache; malaise (vague feeling of discomfort); hand tremor; convulsions; dyspnea (breathing difficulty); skin vesiculation; liquid: frostbite; [potential occupational carcinogen]	Eye: Irrigate immediately (liquid) Skin: Water flush immediately (liquid) Breathing: Respiratory support
1.3.1 – 1.3.14	Methyl Chloride Chloromethane Monochloromethane	74-87-3	NA	100 ppm 2000 ppm	Groundwater Soil	inhalation, skin and/or eye contact	dizziness, nausea, vomiting; visual disturbance, stagger, slurred speech, convulsions, coma; liver, kidney damage; liquid: frostbite; reproductive, teratogenic effects; [potential occupational carcinogen]	Eye: Frostbite Skin: Frostbite Breathing: Respiratory support

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Methyl *tert*-butyl ether MTBE Methyl tertiary-butyl ether Methyl t-butyl ether tert-Butyl methyl ether tBME tert-BuOMe	1634-04-4	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Methylcyclohexane Methyl cyclohexane Hexahydrotoluene Cyclohexylmethane Toluene hexahydride	108-87-2	PID	500 ppm 1200 ppm	Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, drowsiness; in animals: narcosis	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Methylene Chloride Dichloromethane Methylene dichloride	75-09-2	PID	25 ppm 2300 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numb, tingle limbs; nausea; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	m-Xylenes 1,3-Dimethylbenzene m-Xylol Metaxylene	108-38-3	PID	100 ppm 900 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Naphthalene Naphthalin Tar camphor White tar	91-20-3	PID	50 mg/m^3 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; hematuria (blood in the urine); dermatitis, optical neuritis	Eye: Irrigate immediately Skin: Molten flush immediately/solid-liquid soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	n-Butylbenzene	104-51-8	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin; dry nose, throat; headache; low blood pressure, tachycardia, abnormal cardiovascular system stress; central nervous system, hematopoietic depression; metallic taste; liver, kidney injury	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	n-Hexane Hexane, Hexyl hydride, normal-Hexane	110-54-3	PID	500 ppm 1100 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose; nausea, headache; peripheral neuropathy: numb extremities, muscle weak; dermatitis; dizziness; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Nickel	7440-02-0	None	NA 10 mg/m3	Groundwater Soil	ion, ingestion, skin and/or eye contact	sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	N-Nitrosodiphenylamine N-Nitrosodiphenylamine	86-30-6	PID	NA NA	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, respiratory system	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Non-Flammable Gas Mixture CALGAS (Equipment Calibration Gas : Oxygen Methane Hydrogen Sulfide Carbon Monoxide Nitrogen	 7782-44-7 74-82-8 7783-08-4 830-08-0 7727-37-9	Multi-Gas PID	 NA/NA NA/NA 10/100 ppm 50/1200 ppm NA/NA	NA	inhalation	dizziness, headache, and nausea	Breathing: Respiratory support

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Non-Flammable Gas Mixture CALGAS (Equipment Calibration Gas : Oxygen Isobutylene Nitrogen	7782-44-7 115-11-7 7727-37-9	PID	NA/NA NA/NA NA/NA	NA	inhalation	dizziness, headache, and nausea	Breathing: Respiratory support
1.3.1 – 1.3.14	n-Propylbenzene Isocumene Propylbenzene 1-Phenylpropane 1-Propylbenzene Phenylpropane	103-65-1	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin; dry nose, throat; headache; low blood pressure, tachycardia, abnormal cardiovascular system stress; central nervous system, hematopoietic depression; metallic taste; liver, kidney injury	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	o-Cresol ortho-Cresol 2-Cresol o-Cresylic acid 1-Hydroxy-2-methylbenzene 2-Hydroxytoluene 2-Methyl phenol 2-Methylphenol 2-Metyhlphenol	95-48-7	PID	5 ppm 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	o-Xylenes 1,2-Dimethylbenzene ortho-Xylene o-Xylol	95-47-6	PID	100 ppm 900 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	p-Cresol para-Cresol 4-Cresol p-Cresylic acid 1-Hydroxy-4-methylbenzene 4-Hydroxytoluene 4-Methylphenol	106-44-5	PID	5 ppm 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	p-Dichlorobenzene p-DCB 1,4-Dichlorobenzene para-Dichlorobenzene Dichlorocide	106-46-7	PID	75 ppm 150 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	p-Diethylbenzene 1,4-Diethylbenzene 1,4-Diethyl benzene	105-05-5	PID	None None	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, respiratory system; skin burns; in animals: central nervous system depression	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	p-Ethyltoluene 4-Ethyltoluene 1-ethyl-4-methyl-benzene 1-methyl-4-ethylbenzene	622-96-8	NA	NA NA	Soil	ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Phenanthrene	85-01-8	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.14	Phenol Carbolic acid Hydroxybenzene, Monohydroxybenzene Phenyl alcohol Phenyl hydroxide	108-95-2	PID	5 ppm 250 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine, skin burns; dermatitis; tremor, convulsions, twitching	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Potassium	7440-09-7	None	NA NA	Soil	inhalation, skin absorption, ingestion, skin and/or eye contact inhalation, ingestion, skin and/or eye contact	eye: Causes eye burns. Skin: Causes skin burns. Reacts with moisture in the skin to form potassium hydroxide and hydrogen with much heat. ingestion: Causes gastrointestinal tract burns. inhalation: May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Causes chemical burns to the respiratory tract. inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.	Eyes: Get medical aid immediately Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Ingestion: If victim is conscious and alert, give 2-4 full cups of milk or water. Get medical aid immediately. inhalation: Get medical aid immediately.
1.3.1 – 1.3.14	Propylene Propene Methyl ethylene	115-07-1	PID	NA NA	Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat, skin burns asphyxiation	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Propylene dichloride Dichloro-1,2-propane 1,2-Dichloropropane	78-87-5	PEL	75 ppm 400 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, respiratory system; drowsiness, dizziness; liver, kidney damage; in animals: central nervous system depression; [potential occupational carcinogen]	irritation to the eyes, skin, respiratory system; drowsiness, dizziness; liver, kidney damage; in animals: central nervous system depression; [potential occupational carcinogen]
1.3.1 – 1.3.14	p-Xylenes 1,4-Dimethylbenzene para-Xylene p-Xylol	106-42-3	PID	100 ppm 900 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Pyrene benzo[def]phenanthrene	129-00-0	PID	0.2 mg/m^3 80 mg/m^3 (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	sec-Butylbenzene	135-98-8	PID	10 ppm 100 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; inhalation: nausea or vomiting	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Selenium	7782-49-2	None	1 mg/m^3 0.2 mg/m^3	Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Silver	7440-22-4	None	0.01 mg/m^3 10 mg/m^3	Soil	inhalation, ingestion, skin and/or eye contact	blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance	Eye: Irrigate immediately Skin: Water flush Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Sodium	7440-23-5	None	NA NA	Groundwater Soil	ion, ingestion, skin and/or eye contact	sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Styrene Ethenyl benzene Phenylethylene Styrene monomer Styrol Vinyl benzene	100-42-5	PID	100 ppm 700 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, respiratory system; headache, lassitude (weakness, exhaustion), dizziness, confusion, malaise (vague feeling of discomfort), drowsiness, unsteady gait; narcosis; defatting dermatitis; possible liver injury; reproductive effects	Eye: Irrigate immediately Skin: Water flush Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Tert-Butyl Alcohol Tertiary Butyl Alcohol Tert-Butanol Butyl alcohol 2-Methyl-2-propanol Trimethyl carbinol TBA	75-65-0	PID	100 ppm 1600 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; drowsiness, narcosis	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	tert-Butylbenzene *t*-Butylbenzene 2-Methyl-2-phenylpropane Pseudobutylbenzene	98-06-6	PID	10 ppm NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	eye, skin irritation; dry nose, throat; headaches; low blood pressure, tachycardia; abnormal cardiovascular system; central nervous system depression; hematopoietic depression	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Tetrachloroethylene Perchlorethylene Perchloroethylene PCE Perk Tetrachlorethylene Tetrachloroethene	127-18-4	PID	100 ppm 150 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Tetrahydrofuran Diethylene oxide 1,4-Epoxybutane Tetramethylene oxide THF	109-99-9	PID	200 ppm 2000 ppm	Groundwater Soil Vapor	inhalation, skin and/or eye contact, ingestion	irritation to the eyes, upper respiratory system; nausea, dizziness, headache, central nervous system depression	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immedi
1.3.1 – 1.3.14	Thallium	7440-28-0	None	0.1 mg/m^3 15 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peri neuritis, tremor; retrosternal (occurring behind the sternum) tightness, chest pain, pulmonary edema; convulsions, chorea, psychosis; liver, kidney damage; alopecia; paresthesia legs	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Toluene Methyl benzene Methyl benzol Phenyl methane Toluol	108-88-3	PID	200 ppm 500 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, paresthesia; dermatitis	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Total PCBs Chlorodiphenyl (42% chlorine) Aroclor® 1242 PCB Polychlorinated biphenyl	53469-21-9	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Total Xylenes Dimethylbenzene Xylol	1330-20-7	PID	100 ppm 900 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Trans-Chlordane gamma-Chlordane	5103-74-2	None	0.5 mg/m^3 100 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	Blurred vision; confusion; ataxia, delirium; cough; abdominal pain, nausea, vomiting, diarrhea; irritability, tremor, convulsions; anuria	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Trichloroethylene Ethylene trichloride TCE Trichloroethene Trilene	79-01-6	PID	100 ppm 1000 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Trivalent Chromium Chromium III	NA	None	1.0 mg/m^3 250 mg/m^3	Groundwater Soil	inhalation absorption ingestion	irritation to eye, skin, and respiratory	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.14	Vanadium	7440-62-2	None	0.1 mg/m3 15 mg/m3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peri neuritis, tremor; retrosternal (occurring behind the sternum) tightness, chest pain, pulmonary edema; convulsions, chorea, psychosis; liver, kidney damage; alopecia; paresthesia legs	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.14	Vinyl Chloride Chloroethene Chloroethylen Ethylene monochloride Monochloroethene Monochloroethylene VC Vinyl chloride monomer (VCM)	75-01-4	PID	1 ppm NA	Groundwater Soil Vapor	inhalation, skin and/or eye contact (liquid)	lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]	Eye: Frostbite Skin: Frostbite Breathing: Respiratory support
1.3.1 – 1.3.14	Zinc	7440-62-2	None	15 mg/m^3 500 mg/m^3	Groundwater Soil	inhalation	chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function	Breathing: Respiratory support

EXPLANATION OF ABBREVIATIONS

PID = Photoionization Detector
PEL = Permissible Exposure Limit (8-hour Time Weighted Average)
IDLH = Immediately Dangerous to Life and Health
ppm = part per million
mg/m^3 = milligrams per cubic meter
500 mg/m^3

TABLE 3
Summary of Monitoring Equipment

Instrument	Operation Parameters
Photoionization Detector (PID)	**Hazard Monitored:** Many organic and some inorganic gases and vapors. **Application:** Detects total concentration of many organic and some inorganic gases and vapors. Some identification of compounds is possible if more than one probe is measured. **Detection Method:** Ionizes molecules using UV radiation; produces a current that is proportional to the number of ions. **General Care/Maintenance:** Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories. **Typical Operating Time:** 10 hours. 5 hours with strip chart recorder.
Oxygen Meter	**Hazard Monitored:** Oxygen (O_2). **Application:** Measures the percentage of O_2 in the air. **Detection Method:** Uses an electrochemical sensor to measure the partial pressure of O_2 in the air, and converts the reading to O_2 concentration. **General Care/Maintenance:** Replace detector cell according to manufacturer's recommendations. Recharge or replace batteries prior to explanation of the specified interval. If the ambient air is less than 0.5% C O_2 , replace the detector cell frequently. **Typical Operating Time:** 8 – 12 hours.
Additional equipment (if needed, based on site conditions)	
Combustible Gas Indicator (CGI)	**Hazard Monitored:** Combustible gases and vapors. **Application:** Measures the concentration of combustible gas or vapor. **Detection Method:** A filament, usually made of platinum, is heated by burning the combustible gas or vapor. The increase in heat is measured. Gases and vapors are ionized in a flame. A current is produced in proportion to the number of carbon atoms present. **General Care/Maintenance:** Recharge or replace battery. Calibrate immediately before use. **Typical Operating Time:** Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.
Flame Ionization Detector (FID) with Gas Chromatography Option *(i.e., Foxboro Organic Vapor Analyzer (OVA))*	**Hazard Monitored:** Many organic gases and vapors (approved areas only). **Application:** In survey mode, detects the concentration of many organic gases and vapors. In gas chromatography (GC) mode, identifies and measures specific compounds. In survey mode, all the organic compounds are ionized and detected at the same time. In GC mode, volatile species are separated. **General Care/Maintenance:** Recharge or replace battery. Monitor fuel and/or combustion air supply gauges. Perform routine maintenance as described in the manual. Check for leaks. **Typical Operating Time:** 8 hours; 3 hours with strip chart recorder.
Potable Infrared (IR) Spectrophotometer	**Hazard Monitored:** Many gases and vapors. **Application:** Measures concentration of many gases and vapors in air. Designed to quantify one or two component mixtures. **Detection Method:** Passes different frequencies of IR through the sample. The frequencies absorbed are specific for each compound. **General Care/Maintenance:** As specified by the manufacturer.

Instrument	Operation Parameters
Direct Reading Colorimetric Indicator Tube	**Hazard Monitored:** Specific gas and vapors. **Application:** Measures concentration of specific gases and vapors. **Detection Method:** The compound reacts with the indicator chemical in the tube, producing a stain whose length or color change is proportional to the compound's concentration. **General Care/Maintenance:** Do not use a previously opened tube even if the indicator chemical is not stained. Check pump for leaks before and after use. Refrigerate before use to maintain a shelf life of about 2 years. Check expiration dates of tubes. Calibrate pump volume at least quarterly. Avoid rough handling which may cause channeling.
Aerosol Monitor	**Hazard Monitored:** Airborne particulate (dust, mist, fume) concentrations **Application:** Measures total concentration of semi-volatile organic compounds, PCBs, and metals. **Detection Method:** Based on light-scattering properties of particulate matter. Using an internal pump, air sample is drawn into the sensing volume where near infrared light scattering is used to detect particles. **General Care/Maintenance:** As specified by the mfr. Also, the instrument must be calibrated with particulates of a size and refractive index similar to those to be measured in the ambient air.
Monitox	**Hazard Monitored:** Gases and vapors. **Application:** Measures specific gases and vapors. **Detection Method:** Electrochemical sensor relatively specific for the chemical species in question. **General Care/Maintenance:** Moisten sponge before use; check the function switch; change the battery when needed.
Gamma Radiation Survey Instrument	**Hazard Monitored:** Gamma Radiation. **Application:** Environmental radiation monitor. **Detection Method:** Scintillation detector. **General Care/Maintenance:** Must be calibrated annually at a specialized facility. **Typical Operating Time:** Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.

TABLE 4
INSTRUMENTATION ACTION LEVELS

Photoionization Detector Action Levels	Action Required
Background to 5 ppm	No respirator; no further action required
> 1 ppm but < 5 ppm for > 5 minutes	1. Temporarily discontinue all activities and evaluate potential causes of the excessive readings. If these levels persist and cannot be mitigated (i.e., by slowing drilling or excavation activities), contact HSO to review conditions and determine source and appropriate response action. 2. If PID readings remain above 1 ppm, temporarily discontinue work and upgrade to Level C protection. 3. If sustained PID readings fall below 1 ppm, downgrading to Level D protection may be permitted.
> 5 ppm but < 150 ppm for > 5 minutes	1. Discontinue all work; all workers shall move to an area upwind of the jobsite. 2. Evaluate potential causes of the excessive readings and allow work area to vent until VOC concentrations fall below 5 ppm. 3. Level C protection will continue to be used until PID readings fall below 1 ppm.
> 150 ppm	Evacuate the work area

Notes:
1. 1 ppm level based on OSHA Permissible Exposure Limit (PEL) for benzene.
2. 5 ppm level based on OSHA Short Term Exposure Limit (STEL) maximum exposure for benzene for any 15 minute period.
3. 150 ppm level based on NIOSH Immediately Dangerous to Life and Health (IDLH) for tetrachloroethylene.

TABLE 5
EMERGENCY NOTIFICATION LIST

ORGANIZATION	CONTACT	TELEPHONE
Local Police Department	NYPD	911
Local Fire Department	NYFD	911
Ambulance/Rescue Squad	NYFD	911
Hospital	NYU Medical Center	911 or 212-263-7300
Langan Incident Hotline		800-952-6426 ex 4699
Medical Treatment Hotline	Incident Intervention	888-449-7787
Langan Environmental PM	Julia Leung	917-892-3222 (cell)
Langan Health and Safety Manager (HSM)	Tony Moffa	215-756-2523 (cell)
Langan Health & Safety Officer (HSO)	William Bohrer	410-984-3068 (cell)
Langan Field Team Leader (FTL)	To Be Determined	
Client's Representative	John Alber	212-978-1645
National Response Center (NRC)		800-424-8802
Chemical Transportation Emergency Center (Chemtrec)		800-424-9300
Center for Disease Control (CDC)		404-639-3534
EPA (RCRA Superfund Hotline)		800-424-9346
TSCA Hotline		202-554-1404
Poison Control Center		800-222-1222

Immediately following an injury, unless immediate emergency medical treatment is required, the injured employee must contact Incident Intervention® at 888-449-7787.

For all other incidents or near misses, unless emergency response is required, either the employee or a coworker must contact the Langan Incident Hotline at 1-(800)-9-LANGAN (ext. #4699).

TABLE 6
SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATED WORKERS[A]

Adjusted Temperature[b]	Normal Work Ensemble[c]	Impermeable Ensemble
90°F or above (32.2°C) or above	After each 45 min. of work	After each 15 min. of work
87.5°F (30.8°-32.2°C)	After each 60 min. of work	After each 30 min. of work
82.5°-87.5°F (28.1°-30.8°C)	After each 90 min. of work	After each 60 min. of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 min. of work	After each 90 min. of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 min. of work	After each 120 min. of work

a For work levels of 250 kilocalories/hour.

b Calculate the adjusted air temperature (ta adj) by using this equation: ta adj $^{\circ}$F = ta $^{\circ}$F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

c A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

TABLE 7

HEAT INDEX

ENVIRONMENTAL TEMPERATURE (Fahrenheit)

RELATIVE HUMIDITY	70	75	80	85	90	95	100	105	110	115	120
	APPARENT TEMPERATURE*										
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	116
20%	66	72	77	82	87	93	99	105	112	120	**130**
30%	67	73	78	84	90	96	104	113	123	**135**	**148**
40%	68	74	79	86	93	101	110	123	**137**	**151**	
50%	69	75	81	88	96	107	120	**135**	**150**		
60%	70	76	82	90	100	114	**132**	**149**			
70%	70	77	85	93	106	124	**144**				
80%	71	78	86	97	113	**136**					
90%	71	79	88	102	122						
100%	72	80	91	108							

*Combined Index of Heat and Humidity...what it "feels like" to the body
Source: National Oceanic and Atmospheric Administration

How to use Heat Index:
1. Across top locate Environmental Temperature
2. Down left side locate Relative Humidity
3. Follow across and down to find Apparent Temperature
4. Determine Heat Stress Risk on chart at right

Note: Exposure to full sunshine can increase Heat Index values by up to 15 degrees F.

Apparent Temperature	Heat Stress Risk with Physical Activity and/or Prolonged Exposure
90-105	Heat Cramps or Heat Exhaustion Possible
105-130	Heat Cramps or Heat Exhaustion Likely, Heat Stroke Possible
>130	Heatstroke Highly Likely

FIGURES

FIGURE 1

Site Location Map

NOTES
1. BASE MAP SOURCE: USGS (2016) 7.5-MINUTE BROOKLYN, N.Y., TOPOGRAPHIC QUADRANGLES
2. NORTH ARROW SHOWS TRUE NORTH.

LEGEND

— — APPROXIMATE SITE BOUNDARY

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project 45 COMMERCIAL STREET BLOCK No. 2472, LOT No. 70 BROOKLYN KINGS COUNTY NEW YORK	Figure Title SITE LOCATION MAP	Project No. 170229024 Date 03/26/2020 Drawn By DC Checked By WK	Figure No. 1

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Filename: \\langan.com\data\NYC\data0\170229024\Project Data\CAD\24\SheetFiles\Environmental\BCP RIR\Figure 1 - Site Location Map.dwg Date: 5/26/2020 Time: 13:31 User: rbalkind Style Table: Langan.stb Layout: ANSIA-BP

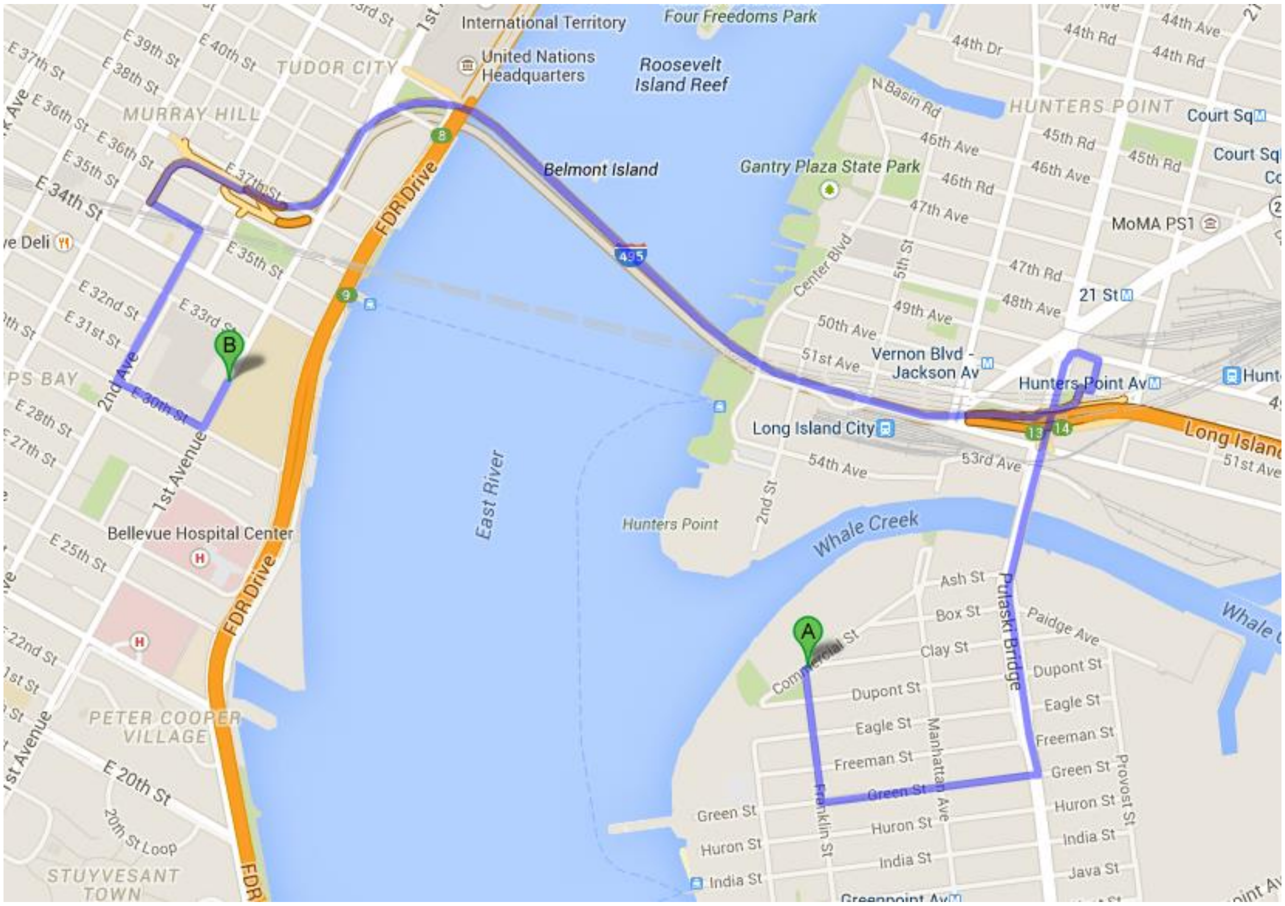
FIGURE 2
HOSPITAL ROUTE PLAN

Hospital Location: **NYU Medical Center**
550 1st Avenue
New York, New York
212-263-7300

START: Corner of Franklin and Commercial Streets, Brooklyn, NY

1. Head south on Franklin Street
2. Turn left onto Green Street
3. Take the 2nd left onto McGuinness Boulevard
4. Continue straight onto Pulaski Bridge
5. Slight right toward 49th Avenue
6. Take the 1st right onto 49th Avenue
7. Turn right onto 11th Place
8. Turn right onto 50th Avenue
9. Turn left onto the I-495 W ramp
10. Keep left and merge onto I-495 W
11. Take the exit on the left toward E 35th Street
12. Turn left onto E 35th Street
13. Take the 1st right onto 2nd Avenue
14. Turn left onto E 30th Street
15. Turn left onto 1st Avenue

END: 550 1st Ave, New York, NY 10016


International Territory
United Nations Headquarters
Four Freedoms Park
Roosevelt Island Reef
Belmont Island
Gantry Plaza State Park
TUDOR CITY
MURRAY HILL
HUNTERS POINT
E 39th St
E 40th St
E 37th St
E 38th St
E 36th St
E 35th St
E 34th St
E 32nd St
E 33rd St
E 31st St
E 30th St
E 28th St
E 27th St
E 25th St
E 22nd St
E 20th St
20th St Loop
2nd Ave
1st Avenue
FDR Drive
Bellevue Hospital Center
PETER COOPER VILLAGE
STUYVESANT TOWN
East River
Hunters Point
Whale Creek
Long Island City
Vernon Blvd - Jackson Av
Hunters Point Av
21 St
MoMA PS1
Court Sq
44th Dr
44th Rd
44th Ave
N Basin Rd
45th Ave
45th Rd
46th Ave
46th Rd
47th Ave
47th Rd
48th Ave
49th Ave
50th Ave
51st Ave
53rd Ave
54th Ave
Center Blvd
5th St
2nd St
Long Island
Ash St
Box St
Clay St
Commercial St
Dupont St
Eagle St
Freeman St
Green St
Huron St
India St
Java St
Paidge Ave
Pulaski Bridge
Manhattan Ave
Franklin St
Provost St
Greenpoint Av
495
A
B

ATTACHMENT A

STANDING ORDERS

STANDING ORDERS

GENERAL

- No smoking, eating, or drinking in this work zone.
- Upon leaving the work zone, personnel will thoroughly wash their hands and face.
- Minimize contact with contaminated materials through proper planning of work areas and decontamination areas, and by following proper procedures. Do not place equipment on the ground. Do not sit on contaminated materials.
- No open flames in the work zone.
- Only properly trained and equipped personnel are permitted to work in potentially contaminated areas.
- Always use the appropriate level of personal protective equipment (PPE).
- Maintain close contact with your buddy in the work zone
- Contaminated material will be contained in the Exclusion Zone (EZ).
- Report any unusual conditions.
- Work areas will be kept clear and uncluttered. Debris and other slip, trip, and fall hazards will be removed as frequently as possible.
- The number of personnel and equipment in the work zone will be kept to an essential minimum.
- Be alert to the symptoms of fatigue and heat/cold stress, and their effects on the normal caution and judgment of personnel.
- Conflicting situations which may arise concerning safety requirements and working conditions must be addressed and resolved quickly by the site HSO.

TOOLS AND HEAVY EQUIPMENT

- Do not, under any circumstances, enter or ride in or on any backhoe bucket, materials hoist, or any other device not specifically designed to carrying passengers.
- Loose-fitting clothing or loose long hair is prohibited around moving machinery.
- Ensure that heavy equipment operators and all other personnel in the work zone are using the same hand signals to communicate.
- Drilling/excavating within 10 feet in any direction of overhead power lines is prohibited.
- The locations of all underground utilities must be identified and marked out prior to initiating any subsurface activities.
- Check to insure that the equipment operator has lowered all blades and buckets to the ground before shutting off the vehicle.
- If the equipment has an emergency stop device, have the operator show all personnel its location and how to activate it.
- Help the operator ensure adequate clearances when the equipment must negotiate in tight quarters; serve as a signalman to direct backing as necessary.
- Ensure that all heavy equipment that is used in the Exclusion Zone is kept in that zone until the job is done, and that such equipment is completely decontaminated before moving it into the clean area of the work zone.
- Samplers must not reach into or get near rotating equipment such as the drill rig. If personnel must work near any tools that could rotate, the equipment operator must completely shut down the rig prior to initiating such work. It may be necessary to use a remote sampling device.

ATTACHMENT B

DECONTAMINATION PROCEDURES

PERSONNEL DECONTAMINATION

LEVEL C DECONTAMINATION

Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	2. Scrub outer boots, outer gloves and chemical-resistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Canister or Mask Change	4. If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5:	Boot, Gloves and Outer Garment Removal	5. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6:	Face piece Removal	6. Face piece is removed (avoid touching face with fingers). Face piece deposited on plastic sheets.
Station 7:	Field Wash	7. Hands and face are thoroughly washed. Shower as soon as possible.

LEVEL D DECONTAMINATION

Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	2. Scrub outer boots, outer gloves and chemical-resistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Boot, Gloves and Outer Garment Removal	4. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 5:	Field Wash	5. Hands and face are thoroughly washed. Shower as soon as possible.

EQUIPMENT DECONTAMINATION

GENERAL:

Equipment to be decontaminated during the project may include tools, monitoring equipment, respirators, sampling containers, laboratory equipment and drilling equipment.

All decontamination will be done by personnel in protective gear, appropriate for the level of decontamination, as determined by the site HSO. The decontamination work tasks will be split or rotated among support and work crews.

Depending on site conditions, backhoe and pumps may be decontaminated over a portable decontamination pad to contain wash water; or, wash water may be allowed to run off into a storm sewer system. Equipment needed may include a steam generator with high-pressure water, empty drums, screens, screen support structures, and shovels. Drums will be used to hold contaminated wash water pumped from the lined pit. These drums will be labeled as such.

Miscellaneous tools and equipment will be dropped into a plastic pail, tub, or other container. They will be brushed off and rinsed with a detergent solution, and finally rinsed with clean water.

MONITORING EQUIPMENT:

Monitoring equipment will be protected as much as possible from contamination by draping, masking, or otherwise covering as much of the instruments as possible with plastic without hindering the operation of the unit. The PID, HNu or OVA meter, for example, can be placed in a clear plastic bag, which allows reading of the scale and operation of knobs. The probes can be partially wrapped keeping the sensor tip and discharge port clear.

The contaminated equipment will be taken from the drop area and the protective coverings removed and disposed in the appropriate containers. Any dirt or obvious contamination will be brushed or wiped with a disposable paper wipe.

RESPIRATORS:

Respirators will be cleaned and disinfected after every use. Taken from the drop area, the masks (with the cartridges removed and disposed of with other used disposable gear) will be immersed in a cleaning solution and scrubbed gently with a soft brush, followed by a rinse in plain warm water, and then allowed to air dry. In the morning, new cartridges will be installed. Personnel will inspect their own masks for serviceability prior to donning them. And, once the mask is on, the wearer will check the respirator for leakage using the negative and positive pressure fit check techniques.

ATTACHMENT C

EMPLOYEE EXPOSURE/
INJURY INCIDENT REPORT

EMPLOYEE INCIDENT/INJURY REPORT
LANGAN ENGINEERING & ENVIRONMENTAL SERVICES

(Complete and return to Tony Moffa in the Doylestown Office)

Affected Employee Name: ______________________________ Date: ______________________________

Incident type: ☐ Injury ☐ Report Only/No Injury
☐ Near Miss ☐ Other: ________________________________ _______

EMPLOYEE INFORMATION (Person completing Form)

Employee Name: ______________________________ Employee No: ______________________________

Title: ______________________________ Office Location: ______________________________

Length of time employed or date of hire: ______________________________

Mailing address: ______________________________

____

Sex: M ☐ F ☐ Birth date: ______________

Business phone & extension: ______________ Residence/cell phone: ______________________________

ACCIDENT INFORMATION

Project: ______________________________ Project #: ______________________________

Date & time of incident: ______________ Time work started & ended: ______________________________

Site location: ______________________________

Incident Type: Possible Exposure ☐ Exposure ☐ Physical Injury ☐

Names of person(s) who witnessed the incident:____

____

Exact location incident occurred:

____

____

Describe work being done:____________________________________

____

____

____

Describe what affected employee was doing prior to the incident occurring:

____

____

____

Describe in detail how the incident occurred:

____

____

____

____

Nature of the incident (List the parts of the body affected):

____

____

____

____

Person(s) to whom incident was reported (Time and Date):

____

____

List the names of other persons affected during this incident:

Possible causes of the incident (equipment, unsafe work practices, lack of PPE, etc.):

Weather conditions during incident:

MEDICAL CARE INFORMATION

Did affected employee receive medical care? Yes ☐ No ☐

If Yes, when and where was medical care received:__________________________________

Provide name of facility (hospital, clinic, etc.):

Length of stay at the facility?

Did the employee miss any work time? Yes ☐ No ☐ Undetermined ☐

Date employee last worked: ________________________ Date employee returned to work:____

Has the employee returned to work? Yes ☐ No ☐

Does the employee have any work limitations or restrictions from the injury? : Yes ☐ No ☐

If Yes, please describe:

Did the exposure/injury result in permanent disability? Yes ☐ No ☐ Unknown ☐

If Yes, please describe:

HEALTH & SAFETY INFORMATION

Was the operation being conducted under an established site specific HEALTH AND SAFETY PLAN?
Yes ☐ No ☐ Not Applicable: ☐

Describe protective equipment and clothing used by the employee:

____
____
____

Did any limitations in safety equipment or protective clothing contribute to or affect exposure / injury? If so, explain:

____
____
____

____

Employee Signature Date

____

Langan Representative Date

ATTACHMENT D

CALIBRATION LOG

DATE:________________ **PROJECT:____________________**

CALIBRATION LOG

Date & Time	Inst Type	Inst #	Media	Initial Reading	Span #	Calibrat. Reading	Performed By:

DATE:________________ **PROJECT:**____________________

CALIBRATION LOG

Date & Time	Inst Type	Inst #	Media	Initial Reading	Span #	Calibrat. Reading	Performed By:

DATE:________________ PROJECT:____________________

CALIBRATION LOG

Date & Time	Inst Type	Inst #	Media	Initial Reading	Span #	Calibrat. Reading	Performed By:

DATE:________________ PROJECT:____________________

CALIBRATION LOG

Date & Time	Inst Type	Inst #	Media	Initial Reading	Span #	Calibrat. Reading	Performed By:

ATTACHMENT E

MATERIAL SAFETY DATA SHEETS

SAFETY DATA SHEETS

All Langan Field Personnel Completing This Work Plan Are To Have Real Time Accessibility To Material Safety Data Sheet (MSDs) or Safety Data Sheet (SDSs) Through Their Smart Phone.

The link is http://www.msds.com/
The login name is "drapehead"
The password is "2angan987"

If You Are Unable To Use the Smart Phone App, You Are To Bring Printed Copies of the MSDs/SDSs to the Site

ATTACHMENT F

JOBSITE SAFETY INSPECTION CHECKLIST

Jobsite Safety Inspection Checklist

Date: ______________________ **Inspected By:** ______________________

Location: ______________________ **Project #:** ______________________

Check one of the following: **A:** Acceptable **NA**: Not Applicable **D**: Deficiency

	A	NA	D	Remark
1. HASP available onsite for inspection?				
2. Health & Safety Compliance agreement (in HASP) appropriately signed by Langan employees and contractors?				
3. Hospital route map with directions posted on site?				
4. Emergency Notification List posted on site?				
5. First Aid kit available and properly stocked?				
6. Personnel trained in CPR/First Aid on site?				
7. MSDSs readily available, and all workers knowledgeable about the specific chemicals and compounds to which they may be exposed?				
8 Appropriate PPE being worn by Langan employees and contractors?				
9. Project site safe practices ("Standing Orders") posted?				
10. Project staff have 40-hr./8-hr./Supervisor HAZWOPER training?				
11. Project staff medically cleared to work in hazardous waste sites and fit-tested to wear respirators, if needed?				
12. Respiratory protection readily available?				
13. Health & Safety Incident Report forms available?				
14. Air monitoring instruments calibrated daily and results recorded on the Daily Instrument Calibration check sheet?				
15. Air monitoring readings recorded on the air monitoring data sheet/field log book?				
16. Subcontract workers have received 40-hr./8-hr./Spvsr. HAZWOPER training, as appropriate?				
17. Subcontract workers medically cleared to work on site, and fit-tested for respirator wear?				
18. Subcontract workers have respirators readily available?				
19. Mark outs of underground utilities done prior to initiating any subsurface activities?				
20. Decontamination procedures being followed as outlined in HASP?				
21. Are tools in good condition and properly used?				
22. Drilling performed in areas free from underground objects including utilities?				

23. Adequate size/type fire extinguisher supplied?				
24. Equipment at least 20 feet from overhead powerlines?				
25. Evidence that drilling operator is responsible for the safety of his rig.				
26. Trench sides shored, layer back, or boxed?				
27. Underground utilities located and authorities contacted before digging?				
28. Ladders in trench (25-foot spacing)?				
29. Excavated material placed more than 2 feet away from excavation edge?				
30. Public protected from exposure to open excavation?				
31. People entering the excavation regarding it as a permit-required confined space and following appropriate procedures?				
32. Confined space entry permit is completed and posted?				
33. All persons knowledgeable about the conditions and characteristics of the confined space?				
34. All persons engaged in confined space operations have been trained in safe entry and rescue (non-entry)?				
35. Full body harnesses, lifelines, and hoisting apparatus available for rescue needs?				
36. Attendant and/or supervisor certified in basic first aid and CPR?				
37. Confined space atmosphere checked before entry and continuously while the work is going on?				
38. Results of confined space atmosphere testing recorded?				
39. Evidence of coordination with off-site rescue services to perform entry rescue, if needed?				
40. Are extension cords rated for this work being used and are they properly maintained?				
41. Are GFCIs provided and being used?				

Unsafe Acts: ____________________

Notes: ____________________

ATTACHMENT G

JOB SAFETY ANALYSIS FORM

LANGAN	Job Safety Analysis (JSA) Health and Safety
JSA TITLE: **JSA NUMBER:**	**DATE CREATED:** **CREATED BY**: **REVISION DATE:** **REVISED BY:**

Langan employees must review and revise the Job Safety Analysis (JSA) as needed to address the any site specific hazards not identified. Employees must provide their signatures on the last page of the JSA indicating they have review the JSA and are aware the potential hazards associated with this work and will follow the provided preventive or corrective measures.

PERSONAL PROTECTIVE EQUIPMENT REQUIRED: (PPE): ■ Required	☒ As Needed	
☐ Steel-toed boots	☐ Nitrile gloves	☐ Dermal Protection (Specify)
☐ Long-sleeved shirt	☐ Leather/ Cut-resistant gloves	☐ High visibility vest/clothing
☐ Safety glasses	☐Face Shield	☐ Hard hat
ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT NEEDED (Provide specific type(s) or descriptions)		
☐ Air Monitoring:	☐ Respirators:	☐ Other:

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE OR CORRECTIVE ACTION
1.	1. 2.	1a. 1b. 2a. 2b.
2.	1.	1
Additional items identified in the field.		
Additional Items.		

If additional items are identified during daily work activities, please notify all relevant personnel about the change and document on this JSA.

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: COVID-19 Awareness – Site Work
JSA Number: JSA046-00

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Boots	☐ Long Sleeves	☐ Safety Vest (Class 2)	☐ Hard Hat	☐ Hearing Protection
☐ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☐ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Alcohol-based hand sanitizer, disinfectant wipes/spray				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. All Activities	1. Transmittal/exposure of COVID-19	1. Ask yourself and your managers – is this work essential? Can this be done remotely? 2. Stay home if sick or showing symptoms of COVID-19 (e.g. fever, cough, etc.). 3. Carry nitrile gloves, alcohol-based hand sanitizer, and disinfectant wipes/spray during field work. 4. Check federal, state, and/or local travel restrictions **prior** to travel. Many states, counties, and cities are passing strict "shelter-in-place" or business restrictions in response to COVID-19. 5. Immediately notify Beverly Williams or Rory Johnston (Supervisor if employee chooses) if you display symptoms of COVID-19. Symptoms include fever (over 100.4 F), cough, and shortness of breath. 6. Notify Beverly Williams or Rory Johnston, Supervisor and Coronavirus Task Force if you had close contact with an individual who tested positive or displayed symptoms of COVID-19. 7. Do not touch your face, to the extent possible. 8. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. Avoid gatherings of more than 10 people. Limit, to the extent possible, contact with public items/objects.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		9. Clean your hands frequently with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, sneezing, or using the rest room. 10. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry. 11. Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. 12. Clean and disinfect frequently touched surfaces daily, for example, cell phones, computer equipment, headsets, tables, doorknobs, light switches, countertops, handles, desks, toilets, faucets, and sinks.
2. Travel to Jobsite	1. Transmittal/exposure of COVID-19 between passengers 2. Transmittal/exposure of COVID-19 from previous occupants (rental and fleet vehicles) 3. Transmittal/exposure of COVID-19 while refueling	1. Limit the number of occupants to each vehicle to 2 people. Employees should sit as far away from each other as possible. 2. Disinfect high “hand-traffic” areas of the vehicle: Door handles, steering wheel, turn signal and control rods, dashboard controls, seatbelts, armrests, etc. To the extent possible, do not use recycled air for heat/AC and travel with the windows open. 3. Use hand sanitizer before and after pumping gas and only return to the inside of the vehicle after refueling is complete. 4. Wear nitrile gloves if available or disinfect the key pad, pump handle, and fuel grade button prior to use.
3. Conduct Tailgate Safety Meeting & Complete H&S Paperwork	1. Transmittal/exposure of COVID-19 between meeting participants	1. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. 2. Hold meetings outside and keep in mind wind direction. To the extent possible, remain cross-wind from other people. 3. Designate a single person to maintain sign-in sheets/permits throughout the day to limit the passing of pens/clipboards between people. 4. Each person should complete their own JSA, even if they are completing similar tasks as others in order to limit the passing of paper/pens/clipboards between people. 5. Include COVID-19 topics and prevention measures in safety meetings.
4. Conduct Site Work	1. Transmittal/exposure of COVID-19 between site workers and public.	1. Practice social distancing maintaining 6 feet of distance between yourself and others. 2. To the extent possible, do not interact with the public. If it is necessary, politely explain you are practicing social distance and request they stay at least 6 feet away and they do not attempt to pass objects to you. 3. Wear nitrile gloves during site work underneath the appropriate gloves for your task. Utilize appropriate decontamination procedures, securely bag all waste (including nitrile gloves) generated during site work and dispose of. 4. Do not share tools. Each person should be equipped with the tools to complete their task or tasks should be divided to remove the need to share tools. If tools must be shared, surfaces should be disinfected. 5. Clean and disinfect surfaces of rental tools and equipment upon receipt. To the extent possible rent equipment from Langan’s internal equipment reservation center, where cleaning/disinfecting procedures can be verified.
5. Use of Construction Trailers	1. Transmittal/exposure of COVID-19 between site workers and others.	1. Avoid use of shared trailers, if possible. Minimize trailer use to essential personnel. 2. Practice social distancing; maintaining 6 feet of distance between yourself and others in trailer. 3. Clean and disinfect areas including desks, phones, chairs and other common areas, before and after use.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
6. Purchasing Food from a Restaurant	1. Transmittal/exposure of COVID-19 from other customers, staff, surfaces.	1. To the extent possible, bring your own food. 2. If you must visit a restaurant, call ahead for take-out or "contactless delivery". Do not dine in. When picking up food, follow guidelines for <u>Job Step #8: Purchasing Supplies at Retail/Shipping Centers</u>. 3. Wash hands before and after eating.
7. Smoking Cigarettes	1. Transmittal/exposure of COVID-19 by touching mouth with hands	1. Cigarette smokers maybe at greater risk of complications arising from COVID-19. Nicotine patches/lozenges/gum, smoking cessation programs, and prescription medications may aid in "kicking the habit" if you decide to quit. 2. Wash hands thoroughly before and after smoking. 3. Discard cigarette butts properly. Do not light cigarettes from others and do not give cigarettes to others.
8. Hotel Stay	1. Transmittal/exposure of COVID-19 from previous occupants, hotel staff, common areas.	1. Verify the hotel chain/brand has modified cleaning procedures to reflect risk of COVID-19. Most hotel companies have issued statements on their websites and in email blasts reflecting these new procedures. 2. Use the front door, and not peripheral entrances. Front doors of hotels are generally automatic. 3. Request ground floor room to avoid elevator use. 4. If elevator use is required, do not directly touch elevator buttons with your hands. Do not ride elevators with other people, to the extent possible. 5. Bring disinfecting wipes or sanitizing spray. Upon arrival, disinfect high "hand-traffic" areas of the hotel room: Door handles, light switches, shower/sink faucet handles, TV remote, curtain/blind handles. Clean these surfaces daily. 6. Place the "Do Not Disturb" Sign on your door to prevent people (housekeeping) from entering your room. 7. Avoid common spaces and hotel sponsored events where crowds will be present. 8. Confirm hotel cleaning procedures have been modified to address COVID-19. Confirm no COVID-19 cases have occurred in hotel
9. Purchasing Supplies at Retail/Shipping Centers	1. Transmittal/exposure of COVID-19 from other customers, staff, surfaces.	1. Plan your travel to limit the need to visit retail/shipping centers. 2. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. If the store is too crowded/small, consider visiting another store or returning at a different time. 3. Avoid high "hand-traffic" items/areas like door handles (i.e. use your shoulder, hip/butt, or open with a disposable napkin/paper towel), credit cards terminals (i.e. use Apple/Android pay if available), shopping carts/baskets (i.e. bring your own shopping bags), counter tops (i.e. ask clerk if you can hold the items while they are scanned) and bulk/buffet items (i.e. just avoid them). 4. Disinfect your hands before and after visiting a retail/shipping center.

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN	**Job Safety Analysis (JSA)** **Health and Safety**

JSA Title: **General Construction Activities**

JSA Number: **JSA010-01**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☒ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back Strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. Contusions from dropped equipment	1. Use proper lifting techniques / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
2. Installation of piping from vapor wells to skid connections and from discharge piping to effluent stack	1. Pinch fingers when connecting pipes 2. Slips/ Trips/ Falls 3. Machinery Hazards	1. Wear proper PPE (leather gloves) 2. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint 3. Wear proper PPE (safety vest) / Maintain safe distance from operating machinery
3. Remediation equipment installation	1. Back strain when lifting heavy equipment 2. Slips/ Trips/ Falls 3. Traffic	1. Use proper lifting techniques / Use wheeled transport / Minimize distance to vehicle 2. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray pain 3. Wear proper PPE (safety vest)
4. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
4. All activities (cont'd)	8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: **Subsurface Investigation**

JSA Number: **JSA030-01**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☒ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Dielectric Overshoes, Sun Block				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Transport equipment to work area	1. Back/strain 2. Slip/Trip/Falls 3. Traffic 4. Cuts/abrasions/contusions from equipment 5. Accidents due to vehicle operations	1. Use proper lifting techniques/Use wheeled transport 2. Minimize distance to work area/unobstructed path to work area/follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes) 5. Observe posted speed limits/ Wear seat belts at all times
6. Traffic	1. Hit by moving vehicle	1. Use traffic cones and signage/ Use High visibility traffic vests and clothing/ Caution tape when working near active roadways.
7. Field Work (drilling, resistivity testing, and inspection)	1. Biological Hazards: insects, rats, snakes, poisonous plants, and other animals 2. Heat stress/injuries 3. Cold Stress/injuries 4. High Energy Transmission Lines 5. Underground Utilities 6. Electrical (soil resistivity testing)	11. Inspect work area to identify biological hazards. Wear light colored long sleeve shirt and long pants/ Use insect repellant as necessary/ Beware of tall grass, bushes, woods and other areas where ticks may live/ Avoid leaving garbage on site to prevent attracting animals/ Identify and avoid contact with poisonous plants/Beware of rats, snakes, or stray animals. 12. Wear proper clothing (light colored)/ drink plenty of water/ take regular breaks/use sun block 13. Wear proper clothing/ dress in layers/ take regular breaks. 14. Avoid direct contact with high energy transmission lines/ position equipment at least 15 feet or as required by PSE&G from the transmission lines/ wear proper PPE (dielectric overshoes 15 kV minimum rating). 15. Call one-call service before performing intrusive field work/ Review utility mark-outs and available utility drawings (with respect to proposed work locations)/ Follow Underground Utility Guidelines

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		16. See AGI Sting R1 operating manual for specific concerns during operating instrument
8. All activities	11. Slips/ Trips/ Falls 12. Hand injuries, cuts or lacerations during manual handling of materials 13. Foot injuries 14. Back injuries 15. Traffic 16. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 17. High Noise levels 18. Overhead hazards 19. Heat Stress/ Cold Stress 20. Eye Injuries	17. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 18. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 19. Wear Langan approved safety shoes 20. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 21. Wear high visibility clothing & vest / Use cones or signs to designate work area 22. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 23. Wear proper hearing protection 24. Wear hard hat / Avoid areas were overhead hazards exist. 25. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 26. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN	Job Safety Analysis (JSA) Health and Safety
JSA Title: **Excavation Oversight** **JSA Number: JSA041-01**	TAKE 5
A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.	**S – *Stop,*** *what has changed?* **T – *Think*** *about the task* **E – *Evaluate*** *potential hazards* **P – *Plan*** *safe approach* **S - *Start*** *task /* ***Stop*** *& regroup*

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
9. Transport equipment to work area	6. Back Strain 7. Slips/Trips/Falls 8. Traffic 9. Cuts/abrasions/contusions from equipment	6. Use proper lifting techniques / Use wheeled transport 7. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 8. Wear proper PPE (high visibility vest or clothing) 9. Wear proper PPE (leather gloves, long sleeves, safety shoes)
10.Earth Moving Equipment	1. Equipment running over employee	1. Ensure you have direct line of sight with operator of equipment; don't walk behind equipment; maintain a safe distance away from equipment. 2. Wear proper PPE (high vis vest/clothing)
11.Excavation	4. Excavation collapse 5. Confined space 6. Soil	1. Use proper shoring/benching/sloping techniques; Ladder is properly situated in excavation; no water in excavation; competent person has inspected excavation prior to allow employees to enter. 2. Langan employees are not authorized to enter a confined space; 3. Soil and equipment is kept atleast 2 feet from edge of excavation
12.Excavated soil	1. Hazardous substances	1. Use proper equipment to monitor excavated soil for contaminates; ensure levels do not exceed PEL's for contaminates; Wear proper PPE
13. All activities	21. Slips/ Trips/ Falls 22. Hand injuries, cuts or lacerations during manual handling of materials 23. Foot injuries 24. Back injuries 25. Traffic	27. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 28. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 29. Wear proper PPE (Langan approved safety shoes)

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	26. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 27. High Noise levels 28. Overhead hazards 29. Heat Stress/ Cold Stress 30. Eye Injuries	30. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 31. Wear high visibility clothing & vest / Use cones or signs to designate work area 32. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 33. Wear hearing protection 34. Wear hard hat / Avoid areas were overhead hazards exist. 35. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 36. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN	Job Safety Analysis (JSA) Health and Safety

JSA Title: Field Sampling

JSA Number: JSA022-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☐ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
14. Unpack/Transport equipment to work area.	10. Back Strains 11. Slip/Trips/Falls 12. Cuts/Abrasions from equipment 13. Contusions from dropped equipment	10. Use proper lifting techniques/Use wheeled transport 11. Minimize distance to work area/Unobstructed path to work area/follow good housekeeping procedures. Mark slip/trip/fall hazards with orange safety cones. 12. Wear proper PPE (leather gloves, long sleeves). 13. Wear proper PPE (Langan approved safety shoes).
15. Initial Site Arrival-Site Assessment	2. Traffic	3. Situational awareness (be alert of your surroundings). Secure area from through traffic.
16. Surface Water Sampling	7. Contaminated media. Skin/eye contact with biological agents and/or chemicals.	4. Wear appropriate PPE (Safety glasses, appropriate gloves). Review (M)SDS for all chemicals being.
17. Sampling from bridges	1. Struck by vehicles	1. Wear appropriate PPE (Safety Vest). Use buddy system and orange safety cones.
18. Icing of Samples/ Transporting coolers/equipment from work area.	31. Back Strains 32. Slips/Trips/Falls 33. Cuts/Abrasions from equipment 34. Pinch/Crushing Hazards.	37. Drain coolers of water. Use proper lifting techniques. Use wheeled transport. 38. Have unobstructed path from work area. Aware of surroundings. 39. Wear proper PPE (Leather gloves, long sleeves) 40. Wear proper PPE (Leather gloves, long sleeves)
19. Site Departure	1. Contaminated PPE/Vehicle	1. Contaminated PPE should be disposed of on-site. Remove boots and soiled clothing for secure storage in trunk. Wash hands promptly.
20. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	3. Foot injuries 4. Back injuries 35. Traffic 36. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 37. High Noise levels 38. Overhead hazards 39. Heat Stress/ Cold Stress 40. Eye Injuries	2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 41. Wear high visibility clothing & vest / Use cones or signs to designate work area 42. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 43. Wear hearing protection 44. Wear hard hat / Avoid areas were overhead hazards exist. 45. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 46. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN	**Job Safety Analysis (JSA)** **Health and Safety**

JSA Title: **Equipment Transportation and Set-Up**

JSA Number: **JSA012-01**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
21. Transport equipment to work area	14. Back Strain 15. Slips/ Trips/ Falls 16. Traffic 17. Cuts/abrasions from equipment 18. Contusions from dropped equipment	6. Use proper lifting techniques / Use wheeled transport 7. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 8. Wear proper PPE (high visibility vest or clothing) 9. Wear proper PPE (leather gloves, long sleeves) 10. Wear proper PPE (safety shoes)
22. Moving equipment to its planned location	3. Pinch Hazard 4. Slips/ Trips/ Falls	4. Wear proper PPE (leather gloves) 5. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint
23. Equipment Set-up	8. Pinch Hazard 9. Cuts/abrasions to knuckles/hands 10. Back Strain	4. Wear proper PPE (leather gloves) 5. Wear proper PPE (leather gloves) 6. Use proper lifting techniques / Use wheeled transport
24. All activities	41. Slips/ Trips/ Falls 42. Hand injuries, cuts or lacerations during manual handling of materials 43. Foot injuries 44. Back injuries 45. Traffic 46. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 47. High Noise levels 48. Overhead hazards 49. Heat Stress/ Cold Stress	47. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 48. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 49. Wear Langan approved safety shoes 50. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 51. Wear high visibility clothing & vest / Use cones or signs to designate work area

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
7. All activities (cont'd)	50. Eye Injuries	52. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 53. Wear hearing protection 54. Wear hard hat / Avoid areas were overhead hazards exist. 55. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 56. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: **55-gallon Drum Sampling**

JSA Number: **JSA043-01**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☐ Hearing Protection
☒ Safety Glasses	☒ Safety Goggles	☒ Face Shield	☒ Nitrile Gloves	☒ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: All Drums are required to be labeled. Langan employees do not open or move undocumented drums or unlabeled drums without proper project manager authorization.				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
25. Unpack/Transport equipment to work area.	19. Back Strains 20. Slip/Trips/Falls 21. Cuts/Abrasions from equipment 4. Contusions from dropped equipment	14. Use proper lifting techniques/Use wheeled transport 15. Minimize distance to work area/Unobstructed path to work area/follow good housekeeping procedures. Mark slip/trip/fall hazards with orange safety cones. 16. Wear proper PPE (leather gloves, long sleeves). 4. Wear proper PPE (Langan approved safety shoes).
26. Open Drums	1. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid. 2. Pressure from drums.	1. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches. 2. Open drum slowly to relieve pressure. Wear proper PPE: face shield and goggles; correct gloves; and over garments.
27. Collecting Soil/Fluid Sample	5. Irritation to eye from vapor, soil dust, or splashing 6. Irritation to exposed skin	4. Wear proper eye protection including safety glasses/ face shield/googles and when necessary, splash guard. If dust or vapor phase is present, wear appropriate safety breathing gear (1/2 mask or full face mask with correct filter) 5. Wear proper skin protection including nitrile gloves.
28. Closing Drums	1. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid.	5. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches.
29. Moving Drums	2. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid. 3. Back Strains	2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		3. Use proper lifting techniques/Use wheeled transport
30. All activities	51. Slips/ Trips/ Falls 52. Hand injuries, cuts or lacerations during manual handling of materials 53. Foot injuries 54. Back injuries 55. Traffic 56. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 57. High Noise levels 58. Overhead hazards 59. Heat Stress/ Cold Stress 60. Eye Injuries	57. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 58. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 59. Wear Langan approved safety shoes 60. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 61. Wear high visibility clothing & vest / Use cones or signs to designate work area 62. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 63. Wear hearing protection 64. Wear hard hat / Avoid areas were overhead hazards exist. 65. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 66. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN	Job Safety Analysis (JSA) Health and Safety

JSA Title: Site Inspection

JSA Number: JSA024-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☒ Rubber Boots
☒ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
31.Jobsite Pre-briefing	22.None	17. Review JSA, SOP's, and discuss hazards that may be present and control measures for present hazards while on-site.
2. Working near railroads	1. Passing Trains. 2. Slip/Trips/Falls.	1. Wear reflective vest/ Stay away from tracks/ Do not cross tracks within 10 ft. of train car or when there is a train within view/listen for train horn. 2. Be aware of tripping hazards/ Follow good housekeeping procedures/ Mark significant hazards with spray paint or cones.
3. Walking around site	4. Uneven terrain 5. Wildlife: Stray animals, mice/rats, vectors (i.e. mosquitoes, bees, etc.) 6. Weather: Heat/cold stress 7. Slip/Trips/Falls 8. Foot injuries 9. Eye injuries	4. Pay attention to surrounding area (puddles, wet, frozen, uneven areas); Mark with cones or spray paint. 5. Use bug spray/ Avoid stray animals/Use repellant when needed. 6. Dress for the correct weather situation/ Use sunscreen or protective clothing in sunlight, layers in cold weather/ Drink plenty of fluids/ Take breaks when needed. 4. Be aware of tripping hazards/ Follow good housekeeping procedures/ Mark significant hazards with spray paint or cones. 5. Wear proper PPE (Langan approved safety shoes)/ Change wet socks during cold weather. 6. Wear proper PPE (safety glasses/goggles).
4. Working near road	1. Passing vehicles 2. Slip/Trips/Falls	1. Wear reflective vest/ Stay away from roadway/ Use buddy system/ Place signage or cones when needed. 2. Be aware of tripping hazards/ Follow good housekeeping procedures/ Mark significant hazards with spray paint or cones.
5. All activities	61. Slips/ Trips/ Falls 62. Hand injuries, cuts or lacerations during manual handling of materials 63. Foot injuries 64. Back injuries 65. Traffic	67. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 68. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 69. Wear Langan approved safety shoes

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	66. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 67. High Noise levels 68. Overhead hazards 69. Heat Stress/ Cold Stress 70. Eye Injuries	70. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 71. Wear high visibility clothing & vest / Use cones or signs to designate work area 72. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 73. Wear hearing protection 74. Wear hard hat / Avoid areas were overhead hazards exist. 75. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 76. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN	Job Safety Analysis (JSA) Health and Safety

JSA Title: Building Construction Oversight

JSA Number: JSA006-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☒ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
32. Transport equipment to work area	23. Back Strain 24. Slips/ Trips/ Falls 25. Traffic 26. Cuts/abrasions from equipment 27. Contusions from dropped equipment	11. Use proper lifting techniques / Use wheeled transport 12. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 13. Wear proper PPE (high visibility vest or clothing) 14. Wear proper PPE (leather gloves, long sleeves) 15. Wear proper PPE (safety shoes)
33. Drilling/anchor bolt installation	7. Hazards associated with drilling, flying objects, heavy equipment, ground level hazards and dust 8. Slips/ Trips/ Falls 9. Hazards associated with concrete work	6. Maintain a safe distance from drilling operation / Wear proper PPE (hard hat, safety glasses, safety shoes, safety vest) 7. Be aware of potential trip hazards / Follow good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint / Wear the proper PPE (safety shoes) 8. Maintain a safe distance from pouring operation
34. Steel building erection	11. Overhead hazards, falling objects 12. Pinching/crushing hazards	8. Wear proper PPE (hard had, safety glasses, safety vest) / Be aware of overhead hazards and maintain a safe distance of at least 10 ft. 9. All personnel should make others aware of moving objects or their inten to move objects / Avoid areas where pinching and crushing hazards are possible
35. All activities	71. Slips/ Trips/ Falls 72. Hand injuries, cuts or lacerations during manual handling of materials 73. Foot injuries 74. Back injuries	77. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 78. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
4. All activities (cont'd)	75. Traffic 76. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 77. High Noise levels 78. Overhead hazards 79. Heat Stress/ Cold Stress 80. Eye Injuries	79. Wear Langan approved safety shoes 80. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 81. Wear high visibility clothing & vest / Use cones or signs to designate work area 82. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 83. Wear hearing protection 84. Wear hard hat / Avoid areas were overhead hazards exist. 85. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 86. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

LANGAN	Job Safety Analysis (JSA) Health and Safety

JSA Title: **Direct-Push Soil Borings**
JSA Number: **JSA004-01**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT REQUIRED:				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Half-face respirator, dust cartridges, PID (if applicable)				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
36. Move equipment to work site	28. Back strain when lifting equipment 29. Slips/ Trips/ Falls while moving equipment 30. Traffic (if applicable) 31. Pinched fingers or running over toes during geoprobe set-up 32. Overturn drilling rig while transporting to loading dock on flat-bed tow truck	18. Use proper lifting technique (use legs for bending and lifting and not the back)/ Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle 19. Use proper lifting technique (use legs for bending and lifting and not the back) / Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle / Have unobstructed path to vehicle or collection point / Do not lift/walk with boxes that are heavy/difficult to lift 20. Wear high visibility safety vests or clothing / Exercise caution 21. Wear proper PPE (cut-resistant gloves) / Stay alert, be aware of geoprobe rig at all times 22. Drill rig should be parked in center of flat-bed tow truck / Emergency brake shall be used at all times during transport on the flat-bed truck/ All unnecessary personnel should stay away from the flat-bed truck during moving activities
37. Calibration of monitoring equipment	10. Skin or eye contact with calibration chemicals 11. Pinch fingers in monitoring equipment	6. Wear proper PPE (safety glasses/ goggles) 7. Wear proper PPE (leather gloves)
38. Set-up geoprobe rig	13. Geoprobe rig movement	6. All field personnel should stay clear of the geoprobe rig while moving / Use a spotter when backing up the geoprobe
39. Advance geoprobe rods below ground surface to desired depth	10. Underground utilities 11. High noise levels	7. Clean all subsurface soil borings to a minimum of 5 feet below grade 8. Wear proper PPE (hearing protection)
40. Remove and open acetate liner	81. Pinched fingers while removing macrocore 82. Cuts/lacerations when cutting acetate liner open 83. Exposure to hazardous vapors	1. Wear proper PPE (nitrile gloves, cut-resistant or leather gloves 2. Wear proper PPE (cut-resistant or leather gloves) 3. Do not place face over acetate liner when opening / Monitor hazardous vapors in air with PID / Upgrade PPE as necessary based on levels contained in the Health and Safety Plan

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Remove and open acetate liner (cont'd)	84. Skin contact with contaminated soil	4. Wear proper PPE (nitrile gloves)
41. Sample Collections a) Monitor parameters b) Prepare sample containers and labels	1. Contact with potentially contaminated soil 2. Lacerations from broken sample bottles 3. Back strain while transporting full coolers 4. Internal exposure to contaminants and metals through inhalation of dust 5. Slips/ Trips/ Falls	1. Use monitoring devices / Wear proper PPE (safety glasses, nitrile gloves) 2. Do not over-tighten bottle caps / Handle bottles safely to prevent breakage 9. Use proper lifting techniques / Do not lift heavy loads without assistance 10. Avoid creating dust / If necessary, wear a half mask respirator with applicable dust cartridge / Inspect respirator for damage and cleanliness prior to use / Clean respirator after each use and store in a clean, secure location 11. Be alert / Follow good housekeeping procedures
42. Remove excess soil from acetate liner and place in 55-gallon drum (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Cuts/lacerations from acetate liner 2. Pinched fingers/hand while opening/closing drum 3. Skin contact with contaminated soil 4. Soil debris in eyes	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (nitrile gloves) 4. Wear proper PPE (safety glasses)
8. Transport drums to central staging location (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Back, arm or shoulder strain from moving drums 2. Pinch fingers/hand in drum cart when moving drums 3. Pinch fingers/hand when operating lift-gate on vehicle 4. Contact with potentially contaminated groundwater when moving improperly sealed drums 5. Slips when moving drums 6. Drop drum on feet/toes	87. Use drum cart for moving drums / Use proper lifting techniques / Do not lift heavy loads without assistance 88. Wear proper PPE (cut-resistant or leather gloves) 89. Wear proper PPE (cut-resistant or leather gloves) 90. Wear proper PPE (nitrile gloves underneath work gloves) 91. Follow good housekeeping procedures / Ensure route to move drum and storage space is free from obstructions 92. Wear proper PPE (safety shoes) / Work in a safe manner to prevent dropped drum
9. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
9. All activities (cont'd)	10. Eye Injuries	10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

ATTACHMENT H

TAILGATE SAFETY BRIEFING FORM

LANGAN TAILGATE SAFETY BRIEFING

Date:____________________________ Time: ____

Leader:_________________________________ Location:______________________________________

Work Task:

SAFETY TOPICS (*provide some detail of discussion points*)

Chemical Exposure Hazards and Control:

Physical Hazards and Control:

Air Monitoring:

PPE:

Communications:

Safe Work Practices:

Emergency Response:

Hospital/Medical Center Location:

Phone Nos.:

Other:

FOR FOLLOW-UP (the issues, responsibilities, due dates, etc.)

ATTENDEES

PRINT NAME	COMPANY	SIGNATURE

APPENDIX F

QUALITY ASSURANCE PROJECT PLAN

Quality Assurance Project Plan

For

SITE MANAGEMENT PLAN
45 COMMERCIAL STREET
BROOKLYN, NEW YORK

NYSDEC BCP No. C224304

Prepared For:

GPL Development LLC
535 Madison Avenue
New York, NY 10022

Prepared By:

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
21 Penn Plaza
360 West 31st Street, 8th Floor
New York, New York 10001

November 2022
Langan Project No. 170229024

LANGAN

TABLE OF CONTENTS

FIGURES

ATTACHMENTS

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) was prepared for the 45 Commercial Street project site in Brooklyn, New York (the "site"). GPL Development LLC, H Owner LLC, Greenpoint Landing Developers LLC, Greenpoint Storage Terminal LLC, and Greenpoint Landing Associates, L.L.C. (the "Volunteers") entered into a Brownfield Cleanup Agreement (BCA) on April 17, 2021 with the NYSDEC to investigate and remediate the 44,600-square-foot site during redevelopment. On June 11, 2021, a BCA amendment was approved by the NYSDEC to add H1H2 Owner LLC, H1H2 GPL Owner LLC, and H1H2 Retail LLC as Volunteers.

The site is also listed with an 'E' designation (E-317) for hazardous materials, resulting from a Revised Negative Declaration dated November 6, 2013 (City Environmental Quality Review [CEQR] No. 14DCP004K). E-Designation E-317 superseded E-Designation E-138 which was previously assigned to the site in connection with the May 11, 2005 Greenpoint-Williamsburg Rezoning (CEQR No. 04DCP003K). On April 13, 2021, the NYCOER issued a Notice to Proceed and confirmation that the requirements of the hazardous materials E-designation would be satisfied through remediation under the BCP.

Additional site information and data collected previously by Langan and others is provided in the Site Management Plan (SMP). This QAPP accompanies the SMP and specifies analytical methods to be used to ensure that data collected during site management activities are precise, accurate, representative, comparable, complete and meet the sensitivity requirements of the project.

1.2 PROJECT OBJECTIVES

The SMP does not include the collection of soil, groundwater or soil vapor samples in the future. New construction requiring the disturbance, excavation, and/or off-site removal of soil may warrant the collection and analysis of soil samples in accordance with the Excavation Work Plan (EWP) included in Appendix C of the SMP, and NYSDEC Division of Environmental Remediation (DER)-10: Technical Guidance for Site Investigation and Remediation. Accordingly, this QAPP addresses sampling and analytical methods that may be necessary in support of future site improvements or proposed modifications to the SMP. These objectives have been established in order to meet standards that will protect public health and the environment for the site.

1.3 SCOPE OF WORK

The specific scope of work covered in this QAPP includes any future intrusive work at the site that may be conducted beneath the site cap and any site activities covered under the SMP.

The SMP governs future activities relative to the site which may include soil sampling of exported or imported materials.

1.4 DATA QUALITY OBJECTIVES AND PROCESSES

Data Quality Objectives (DQOs) are qualitative and quantitative statements to help ensure that data of known and appropriate quality are obtained during the project. The overall objective is to prevent additional environmental impacts to site media (soil and groundwater) by removal of hazardous lead-impacted fill hot-spots. DQOs for sampling activities are determined by evaluating five factors:

- Data needs and uses: The types of data required and how the data will be used after it is obtained.
- Parameters of Interest: The types of chemical or physical parameters required for the intended use.
- Level of Concern: Levels of constituents, which may require remedial actions or further investigations.
- Required Analytical Level: The level of data quality, data precision, and QA/QC documentation required for chemical analysis.
- Required Detection Limits: The detection limits necessary based on the above information.

The quality assurance and quality control objectives for all measurement data include:

- **Precision** – an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Field sampling precision will be determined by analyzing coded duplicate samples and analytical precision will be determined by analyzing internal QC duplicates and/or matrix spike duplicates.
- **Accuracy** – a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern. For soil samples, accuracy will be determined through the assessment of the analytical results of field blanks and trip blanks for each sample set. Analytical accuracy will be assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), internal standards, laboratory method blanks, instrument calibration, and the percent recoveries of matrix spike compounds added to selected samples and laboratory blanks. For soil vapor or air samples, analytical accuracy will be assessed by examining the percent recoveries that are added to each sample, internal standards, laboratory method blanks, and instrument calibration.

- **Representativeness** – expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is dependent upon the adequate design of the sampling program and will be satisfied by ensuring that the scope of work is followed and that specified sampling and analysis techniques are used. Representativeness in the laboratory is ensured by compliance to nationally-recognized analytical methods, meeting sample holding times, and maintaining sample integrity while the samples are in the laboratory's possession. This is accomplished by following all applicable methods, laboratory-issued standard operating procedures (SOPs), the laboratory's Quality Assurance Manual, and this QAPP. The laboratory is required to be properly certified and accredited.
- **Completeness** – the percentage of measurements made which are judged to be valid. Completeness will be assessed through data validation. The QC objective for completeness is generation of valid data for at least 90 percent of the analyses requested.
- **Comparability** – expresses the degree of confidence with which one data set can be compared to another. The comparability of all data collected for this project will be ensured using several procedures, including standard methods for sampling and analysis as documented in the QAPP, using standard reporting units and reporting formats, and data validation.
- **Sensitivity** – the ability of the instrument or method to detect target analytes at the levels of interest. The project manager will select, with input from the laboratory and QA personnel, sampling and analytical procedures that achieve the required levels of detection.

2.0 PROJECT ORGANIZATION

SMP activities will be overseen by Langan or another environmental consultant for the Volunteer. The environmental consultant will also arrange data analysis and reporting tasks. The analytical services will be performed by an ELAP-certified laboratory. Data validation services will be performed by approved data validation personnel.

Analytical services will be performed by Alpha Analytical Laboratories (Alpha) of Westborough, Massachusetts (NYSDOH ELAP certification number 11148), or an approved alternate ELAP-certified laboratory.

Key contacts for this project are as follows:

H Owner LLC (Owner Representative)	Mr. Guy Morton Telephone: (212) 310-9765
Remediation Engineer:	Jason Hayes, P.E. Telephone: (212) 479-5427
Langan Project Manager:	Mr. Gregory Wyka, P.G., LEED AP ND Telephone: (212) 479-5476
Langan Quality Assurance Officer:	Mr. Michael Burke, CHMM Telephone: (212) 479-5413
Field Team Leader:	Mr. Tyler Goodnough Telephone: (212) 479-5712
Data Validator:	Mr. Joe Conboy Telephone: (609) 282-8055
Laboratory Representatives:	Ben Rao Alpha Analytical, Inc. Telephone: (201) 847-9100

Resumes for the above listed are provided in Attachment A.

3.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) OBJECTIVES FOR MEASUREMENT OF DATA

The quality assurance and quality control objectives for all measurement data include precision, accuracy, representativeness, completeness, comparability, and sensitivity. These objectives are defined in following subsections. Variances from the quality assurance objectives at any stage of the investigation will result in the implementation of appropriate corrective measures and an assessment of the impact of corrective measures on the usability of the data.

3.1 PRECISION

Precision is a measure of the degree to which two or more measurements are in agreement. Field precision is assessed through the collection and measurement of field duplicates. Laboratory precision and sample heterogeneity also contribute to the uncertainty of field duplicate measurements. This uncertainty is taken into account during the data assessment process. For field duplicates, results less than 2x the reporting limit (RL) meet the precision criteria if the absolute difference is less than ±2x the RL. For results greater than 2x the RL, the acceptance criteria is a relative percent difference (RPD) of ≤50% (soil and air), and <30% (water).

3.2 ACCURACY

Accuracy is the measurement of the reproducibility of the sampling and analytical methodology. It should be noted that precise data may not be accurate data. For the purpose of this QAPP, bias is defined as the constant or systematic distortion of a measurement process, which manifests itself as a persistent positive or negative deviation from the known or true value. This may be due to (but not limited to) improper sample collection, sample matrix, poorly calibrated analytical or sampling equipment, or limitations or errors in analytical methods and techniques.

Accuracy in the field is assessed through the use of field blanks and through compliance to all sample handling, preservation, and holding time requirements. All field blanks should be non-detect when analyzed by the laboratory. Any contaminant detected in an associated field blank will be evaluated against laboratory blanks (preparation or method) and evaluated against field samples collected on the same day to determine potential for bias. Trip blanks are not required for non-aqueous matrices but are planned for non-aqueous matrices where high concentrations of VOCs are anticipated.

Laboratory accuracy is assessed by evaluating the percent recoveries of matrix spike/matrix spike duplicate (MS/MSD) samples, laboratory control samples (LCS), surrogate compound recoveries, and the results of method preparation blanks. MS/MSD, LCS, and surrogate percent recoveries will be compared to either method-specific control limits or laboratory-derived control limits. Sample volume permitting, samples displaying outliers should be reanalyzed. All associated method blanks should be non-detect when analyzed by the laboratory.

3.3 COMPLETENESS

Laboratory completeness is the ratio of total number of samples analyzed and verified as acceptable compared to the number of samples submitted to the fixed-base laboratory for analysis, expressed as a percent. Three measures of completeness are defined:

- Sampling completeness, defined as the number of valid samples collected relative to the number of samples planned for collection;

- Analytical completeness, defined as the number of valid sample measurements relative to the number of valid samples collected; and

- Overall completeness, defined as the number of valid sample measurements relative to the number of samples planned for collection.

Soil data will meet a 90% completeness criterion. If the criterion is not met, sample results will be evaluated for trends in rejected and unusable data. The effect of unusable data required for a determination of compliance will also be evaluated.

3.4 REPRESENTATIVENESS

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. Representativeness is dependent upon the adequate design of the sampling program and will be satisfied by ensuring that the scope of work is followed and that specified sampling and analysis techniques are used. This is performed by following applicable standard operating procedures (SOPs) and this QAPP. All field technicians will be given copies of appropriate documents prior to sampling events and are required to read, understand, and follow each document as it pertains to the tasks at hand.

Representativeness in the laboratory is ensured by compliance to nationally-recognized analytical methods, meeting sample holding times, and maintaining sample integrity while the samples are in the laboratory's possession. This is performed by following all applicable United States Environmental Protection Agency (USEPA) methods, laboratory-issued SOPs, the laboratory’s Quality Assurance Manual, and this QAPP. The laboratory is required to be properly certified and accredited.

3.5 COMPARABILITY

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). The comparability of all data collected for this project will be ensured by:

- Using identified standard methods for both sampling and analysis phases of this project;
- Requiring traceability of all analytical standards and/or source materials to the U.S. Environmental Protection Agency (USEPA) or National Institute of Standards and Technology (NIST);
- Requiring that all calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable);
- Using standard reporting units and reporting formats including the reporting of QC data;
- Performing a complete data validation on a representative fraction of the analytical results, including the use of data qualifiers in all cases where appropriate; and
- Requiring that all validation qualifiers be used any time an analytical result is used for any purpose.

These steps will ensure all future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

3.6 SENSITIVITY

Sensitivity is the ability of the instrument or method to detect target analytes at the levels of interest. The project director will select, with input from the laboratory and QA personnel, sampling and analytical procedures that achieve the required levels of detection and QC acceptance limits that meet established performance criteria. Concurrently, the project director will select the level of data assessment to ensure that only data meeting the project DQOs are used in decision-making.

Field equipment will be used that can achieve the required levels of detection for analytical measurements in the field. In addition, the field sampling staff will collect and submit full volumes of samples as required by the laboratory for analysis, whenever possible. Full volume aliquots will help ensure achievement of the required limits of detection and allow for reanalysis if necessary.

Analytical methods and quality assurance parameters associated with the sampling program are presented in Attachment B. The frequency of associated field blanks and duplicate samples will be based on the recommendations listed in DER-10, and as described in Section 5.3.

Site-specific MS and MSD samples will be prepared and analyzed by the analytical laboratory by spiking an aliquot of submitted sample volume with analytes of interest. Additional sample volume may be required by the laboratory for this purpose. An MS/MSD analysis will be analyzed at a rate of 1 out of every 20 samples, or one per analytical batch. MS/MSD samples are only required for soil and groundwater samples.

4.0 SAMPLE COLLECTION AND FIELD DATA ACQUISITION PROCEDURES

Future activities relative to the site may include soil sampling of exported or imported materials. If soil is imported, it will be sampled in accordance with Table 5.4(e)10 (Recommended Number of Soil Samples for Soil Imported to a Site) and analytical results will meet the lower (more restrictive) of the Tittle 6 of the New York Codes, Rules and Regulations (NYCRR) Part 375 RURR and Protection of Groundwater (PGW) SCOs. Imported backfill from off-site sources will be analyzed for Part 375 list and emerging contaminants (including per- and polyfluoroalkyl substances [PFAS] and 1,4-dioxane). The following sections describe procedures to be followed for specific tasks.

4.1 FIELD DOCUMENTATION PROCEDURES

Field documentation procedures will include summarizing field data in field books and proper sample labeling. These procedures are described in the following sections.

4.1.1 Field Data and Notes

Field notebooks contain the documentary evidence regarding procedures conducted by field personnel. Hard cover, bound field notebooks will be used because of their compact size, durability, and secure page binding. The pages of the notebook will not be removed.

Entries will be made in waterproof, permanent blue or black ink. No erasures will be allowed. If an incorrect entry is made, the information will be crossed out with a single strike mark and the change initialed and dated by the team member making the change. Each entry will be dated. Entries will be legible and contain accurate and complete documentation of the individual or sampling team's activities or observations made. The level of detail will be sufficient to explain and reconstruct the activity conducted. Each entry will be signed by the person(s) making the entry.

The following types of information will be provided for each sampling task, as appropriate:

- Project name and number
- Reasons for being on-site or taking the sample
- Date and time of activity
- Sample identification numbers
- Geographical location of sampling points with references to the site, other facilities or a map coordinate system. Sketches will be made in the field logbook when appropriate

- Physical location of sampling locations such as depth below ground surface
- Description of the method of sampling including procedures followed, equipment used and any departure from the specified procedures
- Description of the sample including physical characteristics, odor, etc.
- Readings obtained from health and safety equipment
- Weather conditions at the time of sampling and previous meteorological events that may affect the representative nature of a sample
- Photographic information including a brief description of what was photographed, the date and time, the compass direction of the picture and the number of the picture on the camera
- Other pertinent observations such as the presence of other persons on the site, actions by others that may affect performance of site tasks, etc.
- Names of sampling personnel and signature of persons making entries

Field records will also be collected on field data sheets including boring logs, which will be used for geologic and drilling data during soil boring activities. Field data sheets will include the project-specific number and stored in the field project files when not in use. At the completion of the field activities, the field data sheets will be maintained in the central project file.

4.1.2 Sample Labeling

Each sample collected will be assigned a unique identification number in accordance with the sample nomenclature guidance included in Attachment D, and placed in an appropriate sample container. Each sample container will have a sample label affixed to the outside with the date and time of sample collection and project name. In addition, the label will contain the sample identification number, analysis required and chemical preservatives added, if any. All documentation will be completed in waterproof ink.

4.2 FIELD INSTRUMENT CALIBRATION AND MAINTENANCE

A photoionization detector (PID) will be used during the sampling activities to evaluate work zone action levels, collect pre- and post-sample readings for air samples, screen soil samples, and collect monitoring well headspace readings. Field calibration and/or field checking of the PID will be the responsibility of the field team leader and the site HSO, and will be accomplished by following the procedures outlined in the operating manual for the instrument. At a minimum, field calibration and/or field equipment checking will be performed once daily, prior to use. Field calibration will be documented in the field notebook. Entries made into the logbook regarding the status of field equipment will include the following information:

- Date and time of calibration
- Type of equipment serviced and identification number (such as serial number)
- Reference standard used for calibration
- Calibration and/or maintenance procedure used
- Other pertinent information

Equipment that fails calibration or becomes inoperable during use will be removed from service and segregated to prevent inadvertent utilization. The equipment will be properly tagged to indicate that it is out of calibration. Such equipment will be repaired and recalibrated to the manufacturer's specifications by qualified personnel. Equipment that cannot be repaired will be replaced.

Off-site calibration and maintenance of field instruments will be conducted as appropriate throughout the duration of project activities. All field instrumentation, sampling equipment and accessories will be maintained in accordance with the manufacturer's recommendations and specifications and established field equipment practice. Off-site calibration and maintenance will be performed by qualified personnel. A logbook will be kept to document that established calibration and maintenance procedures have been followed. Documentation will include both scheduled and unscheduled maintenance.

4.3 SAMPLE COLLECTION

Soil Samples

Soil samples will be visually classified and field screened using a PID to assess potential impacts from VOCs and for health and safety monitoring. Soil samples collected for analysis of VOCs will be collected using either EnCore® or Terra Core® sampling equipment. For analysis of non-volatile parameters, samples will be homogenized and placed into glass jars. After collection, all sample jars will be capped and securely tightened, and placed in iced coolers and maintained at 4°C ±2°C until they are transferred to the laboratory for analysis, in accordance with the procedures outlined in Section 5.4. Analysis and/or extraction and digestion of collected soil samples will meet the holding times required for each analyte as specified in Attachment B. In addition, analysis of collected soil sample will meet all quality assurance criteria set forth by this QAPP and DER-10.

Field Quality Control Samples

Trip Blanks – Sample collection for aqueous volatile analysis is not anticipated; therefore, trip blank samples are not required.

Field blanks will be collected for quality assurance purposes at a rate of one per 20 soil samples. Field blanks are used to determine the effectiveness of the decontamination procedures for sampling equipment. The field blank will consist of a sample of deionized, distilled water provided by the laboratory that has passed through a decontaminated bailer, tubing or other sampling apparatus. It is usually collected as a last step in the decontamination procedure, prior to taking an environmental sample. The field blank may be analyzed for all or some of the parameters of interest.

Duplicate soil samples will be collected and analyzed for quality assurance purposes. Duplicate samples will be collected at a frequency of 1 per 20 investigative samples per matrix and will be submitted to the laboratory as "blind" samples. If less than 20 samples are collected during a particular sampling event, one duplicate sample will be collected.

Matrix Spike/Matrix Spike Duplicate - MS/MSD samples (MS/MSD for organics; MS and laboratory duplicate for inorganics) will be taken at a frequency of one pair per 20 field samples. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes. The recovery limits and RPDs for each analyte are statistically derived at the laboratory on an ongoing basis.

4.4 SAMPLE CONTAINERS AND HANDLING

Certified, commercially clean sample containers will be obtained from the analytical laboratory. If soil samples are being collected, the laboratory will also prepare and supply the required trip blanks and field blank sample containers and reagent preservatives. Sample bottle containers, including the field blank containers, will be placed into plastic coolers by the laboratory. These coolers will be received by the field sampling team within 24 hours of their preparation in the laboratory. Prior to the commencement of field work, Langan field personnel will fill the plastic coolers with ice in Ziploc® bags (or equivalent) to maintain a temperature of 4° ±2° C.

Soil samples collected in the field for laboratory analysis will be placed directly into the laboratory-supplied sample containers. Samples will then be placed and stored on-ice in laboratory provided coolers until shipment to the laboratory. Blue ice will not be used to cool PFAS samples. The temperature in the coolers containing samples and associated field blanks will be maintained at a temperature of 4°±2°C while on-site and during sample shipment to the analytical laboratory.

Possession of samples collected in the field will be traceable from the time of collection until they are analyzed by the analytical laboratory or are properly disposed. Chain-of-custody procedures, described in Section 5.9, will be followed to maintain and document sample possession. Samples will be packaged and shipped as described in Section 5.6.

4.5 SPECIAL CONSIDERATIONS FOR PFAS SAMPLE COLLECTION

The following special considerations apply to the collection of soil samples for PFAS analysis to prevent cross-contamination:

- Field equipment will not contain Teflon®
- All sampling material will be made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books will be used
- No plastic clipboards, binders, or spiral hard cover notebooks will be used
- No adhesives will be used
- No sharpies or permanent markers will be used; ball point pens are acceptable
- Aluminum foil will not be used
- PFAS samples will be kept in a separate cooler from other sampling containers
- Coolers will be filled only with regular ice

DER has developed a PFAS target analyte list. At minimum, the laboratory will report the following PFAS target compounds:

Group	Analyte Name	Abbreviation	CAS #
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8

	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanessulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

The PFAS compound sampling protocol is provided in Attachment E.

4.6 SAMPLE PRESERVATION

Sample preservation measures will be used in an attempt to prevent sample decomposition by contamination, degradation, biological transformation, chemical interactions and other factors during the time between sample collection and analysis. Preservation will commence at the time of sample collection and will continue until analyses are performed. Should chemical preservation be required, the analytical laboratory will add the preservatives to the appropriate sample containers before shipment to the office or field. Samples will be preserved according to the requirements of the specific analytical method selected, as shown in Attachment B.

4.7 SAMPLE SHIPMENT

4.7.1 Packaging

Soil sample containers will be placed in plastic coolers. Ice in Ziploc® bags (or equivalent) will be placed around sample containers. Cushioning material will be added around the sample containers if necessary. Chains-of-custody and other paperwork will be placed in a Ziploc® bag (or equivalent) and placed inside the cooler. The cooler will be taped closed and custody seals will be affixed to one side of the cooler at a minimum. If the samples are being shipped by an express delivery company (e.g. FedEx) then laboratory address labels will be placed on top of the cooler.

4.7.2 Shipping

Standard procedures to be followed for shipping environmental samples to the analytical laboratory are outlined below.

- All environmental samples will be transported to the laboratory by a laboratory-provided courier under the chain-of-custody protocols described in Section 5.9.
- Prior notice will be provided to the laboratory regarding when to expect shipped samples. If the number, type or date of shipment changes due to site constraints or program changes, the laboratory will be informed.

4.8 DECONTAMINATION PROCEDURES

Decontamination procedures will be used for non-dedicated sampling equipment. Decontamination of field personnel is discussed in the site-specific sample Health and Safety Plan (HASP) included in Appendix E of the SMP. Field sampling equipment that is to be reused will be decontaminated in the field in accordance with the following procedures:

- Laboratory-grade glassware detergent and tap water scrub to remove visual contamination
- Generous tap water rinse
- Distilled/de-ionized water rinse

4.9 RESIDUALS MANAGEMENT

Debris (e.g., paper, plastic and disposable PPE) will be collected in plastic garbage bags and disposed of as non-hazardous industrial waste. Debris is expected to be transported to a local municipal landfill for disposal. If applicable, residual solids (e.g., leftover soil cuttings) will be placed back in the borehole from which it was sampled. If gross contamination is observed, soil will be collected and stored in Department of Transportation (DOT)-approved 55-gallon drums in a designated storage area at the Site. The residual materials stored in a designated storage area at the site for further characterization, treatment or disposal.

Residual fluids (such as purge water) will be collected and stored in DOT-approved (or equivalent) 55-gallon drums in a designated storage area at the site. The residual fluids will be transported to the on-site wastewater treatment plant or analyzed, characterized and disposed off-site in accordance with applicable federal and state regulations. Residual fluids such as decontamination water may be discharged to the ground surface, however, if gross contamination is observed, the residual fluids will be collected, stored, and transported similar purge water or other residual fluids.

4.10 CHAIN OF CUSTODY PROCEDURES

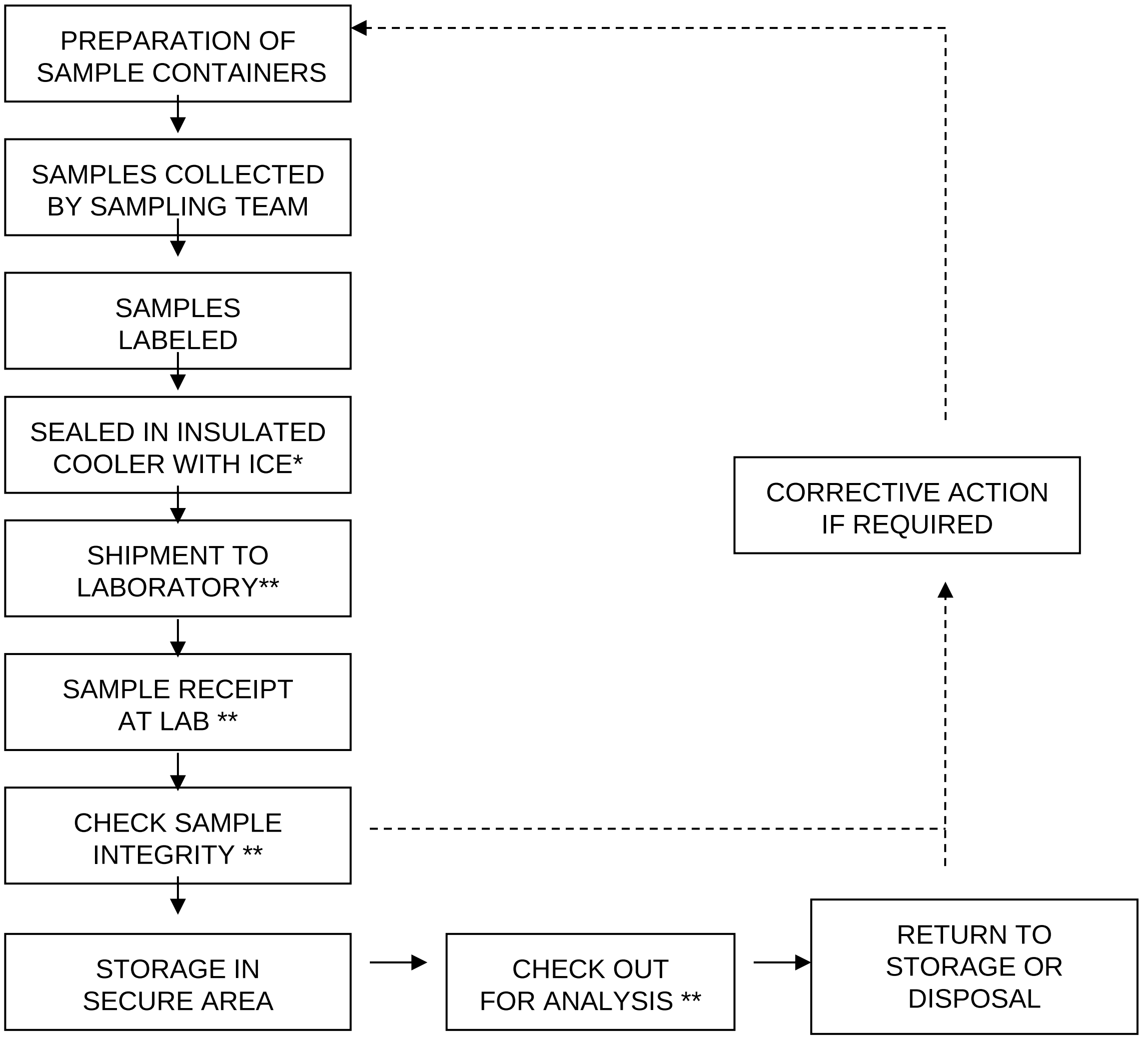
A chain-of-custody protocol has been established for collected samples that will be followed during sample handling activities in both field and laboratory operations. The primary purpose of the chain-of-custody procedures is to document the possession of the samples from collection through shipping, storage and analysis to data reporting and disposal. Chain-of-custody refers to actual possession of the samples. Samples are considered to be in custody if they are within sight of the individual responsible for their security or locked in a secure location. Each person who takes possession of the samples, except the shipping courier, is responsible for sample integrity and safe keeping. Chain-of-custody procedures are provided below:

- Chain-of-custody will be initiated by the laboratory supplying the pre-cleaned and prepared sample containers. Chain-of-custody forms will accompany the sample containers.
- Following sample collection, the chain-of-custody form will be completed for the sample collected. The sample identification number, date and time of sample collection, analysis requested and other pertinent information (e.g., preservatives) will be recorded on the form. All entries will be made in waterproof, permanent blue or black ink.
- Langan field personnel will be responsible for the care and custody of the samples collected until the samples are transferred to another party, dispatched to the laboratory, or disposed. The sampling team leader will be responsible for enforcing chain-of-custody procedures during field work.
- When the form is full or when all samples have been collected that will fit in a single cooler, the sampling team leader will check the form for possible errors and sign the chain-of-custody form. Any necessary corrections will be made to the record with a single strike mark, dated, and initialed.

If soil samples are collected, sample coolers will be accompanied by the chain-of-custody form, sealed in a Ziploc® bag (or equivalent) and placed on top of the samples or taped to the inside of the cooler lid. If applicable, a shipping bill will be completed for each cooler and the shipping bill number recorded on the chain-of-custody form.

Samples will be packaged for shipment to the laboratory with the appropriate chain-of-custody form. A copy of the form will be retained by the sampling team for the project file and the original will be sent to the laboratory with the samples. Bills of lading will also be retained as part of the documentation for the chain-of-custody records, if applicable. When transferring custody of the samples, the individuals relinquishing and receiving custody of the samples will verify sample numbers and condition and will document the sample acquisition and transfer by signing and dating the chain-of-custody form. This process documents sample custody transfer from the sampler to the analytical laboratory. A flow chart showing a sample custody process is included as Figure 4.1, and chain-of-custody forms from Alpha are included as Figures 4.2 and 4.3.

Figure 4.1 Sample Custody



*SUMMA CANISTERS SHOULD NOT BE ICED

** REQUIRES SIGN-OFF ON CHAIN-OF-CUSTODY FORM

Figure 4.2 Sample Chain-of-Custody Form – Air Sample

ALPHA ANALYTICAL

AIR ANALYSIS

CHAIN OF CUSTODY

PAGE______ OF ______

Date Rec'd in Lab:

ALPHA Job #:

320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client:
Address:
Phone:
Fax:
Email:
❐ These samples have been previously analyzed by Alpha

Project Information

Project Name:
Project Location:
Project #:
Project Manager:
ALPHA Quote #:

Turn-Around Time

❐ Standard ❐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

❐ FAX
❐ ADEx
Criteria Checker:
(Default based on Regulatory Criteria Indicated)
Other Formats:
❐ EMAIL (standard pdf report)
❐ Additional Deliverables:
Report to: (if different than Project Manager)

Billing Information

❐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed	Program	Criteria

Other Project Specific Requirements/Comments:

All Columns Below Must Be Filled Out

ANALYSIS

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection: Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	I D Can	I D - Flow Controller	TO-14A by TO-15	TO-15	TO-15 SIM	APH	FIXED GASES	TO-13A	TO-4 / TO-10	Sample Comments (i.e. PID)

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

Relinquished By:	Date/Time	Received By:	Date/Time:

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

Form No: 101-02 (19-Jun-09)

Figure 4.3 Sample Chain-of-Custody Form – Soil and Groundwater

ALPHA ANALYTICAL

NEW YORK CHAIN OF CUSTODY

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page ___ of ___

Date Rec'd in Lab

ALPHA Job #

Client Information

Client:
Address:
Phone:
Fax:
Email:

Project Information

Project Name:
Project Location:
Project #
(Use Project name as Project #) ☐
Project Manager:
ALPHAQuote #:

Turn-Around Time

Standard ☐ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables

☐ ASP-A ☐ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement

☐ NY TOGS ☐ NY Part 375
☐ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Billing Information

☐ Same as Client Info
PO #

Disposal Site Information

Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials									Sample Specific Comments	Total Bottle

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

4.11 LABORATORY SAMPLE STORAGE PROCEDURES

The subcontracted laboratory will use a laboratory information management system (LIMS) to track and schedule samples upon receipt by the analytical laboratories. Any sample anomalies identified during sample log-in must be evaluated on individual merit for the impact upon the results and the data quality objectives of the project. When irregularities do exist, the environmental consultant must be notified to discuss recommended courses of action and documentation of the issue must be included in the project file.

For samples requiring thermal preservation, the temperature of each cooler will be immediately recorded. Each sample and container will be will be assigned a unique laboratory identification number and secured within the custody room walk-in coolers designated for new samples. Samples will be, as soon as practical, disbursed in a manner that is functional for the operational team. The temperature of all coolers and freezers will be monitored and recorded using a certified temperature sensor. Any temperature excursions outside of acceptance criteria (i.e., below 2°C or above 6°C) will initiate an investigation to determine whether any samples may have been affected. Samples for VOCs will be maintained in satellite storage areas within the VOC laboratory. Following analysis, the laboratory's specific procedures for retention and disposal will be followed as specified in the laboratory's SOPs and/or QAM.

5.0 DATA REDUCTION, VALIDATION, AND REPORTING

5.1 INTRODUCTION

Data collected during any additional sampling will be reduced and reviewed by the laboratory QA personnel, and a report on the findings will be tabulated in a standard format. The criteria used to identify and quantify the analytes will be those specified for the applicable methods in the USEPA SW-846 and subsequent updates. The data package provided by the laboratory will contain all items specified in the USEPA SW-846 appropriate for the analyses to be performed, and be reported in standard format.

The completed copies of the chain-of-custody records (both external and internal) accompanying each sample from time of initial bottle preparation to completion of analysis shall be attached to the analytical reports.

5.2 DATA REDUCTION

The Analytical Services Protocol (ASP) Category B data packages and an electronic data deliverable (EDD) will be provided by the laboratory after receipt of a complete sample delivery group. The Project Manager will immediately arrange for archiving the results and preparation of result tables. These tables will form the database for assessment of the site contamination condition.

Each EDD deliverable must be formatted using a Microsoft Windows operating system and the NYSDEC data deliverable format for EQuIS. To avoid transcription errors, data will be loaded directly into the ASCII format from the laboratory information management system (LIMS). If this cannot be accomplished, the consultant should be notified via letter of transmittal indicating that manual entry of data is required for a particular method of analysis. All EDDs must also undergo a QC check by the laboratory before delivery. The original data, tabulations, and electronic media are stored in a secure and retrievable fashion.

The Project Manager or Task Manager will maintain close contact with the QA reviewer to ensure all non-conformance issues are acted upon prior to data manipulation and assessment routines. Once the QA review has been completed, the Project Manager may direct the Team Leaders or others to initiate and finalize the analytical data assessment.

5.3 DATA VALIDATION

Data validation will be performed in accordance with the USEPA validation guidelines for organic and inorganic data review. Validation will include the following:

- Verification of the QC sample results,
- Verification of the identification of sample results (both positive hits and non-detects),
- Preparation of Data Usability Summary Reports (DUSR).

A DUSR will be prepared and reviewed by the QAO before issuance. The DUSR will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. A detailed assessment of each SDG will follow. For each of the organic analytical methods, the following will be assessed:

- Holding times;
- Instrument tuning (as applicable);
- Instrument calibrations;
- Blank results;
- System monitoring compounds or surrogate recovery compounds (as applicable);
- Internal standard recovery results (as applicable);
- MS and MSD results (as applicable);
- Target compound identification;
- Chromatogram quality (as applicable);
- Pesticide cleanup (as applicable);
- Compound quantitation and reported detection limits;
- System performance; and
- Results verification.

For each of the inorganic compounds, the following will be assessed:

- Holding times;

- Calibrations;
- Blank results;
- Interference check sample (as applicable);
- Laboratory check samples;
- Duplicates;
- Matrix Spike;
- Furnace atomic absorption analysis QC (as applicable);
- ICP serial dilutions (as applicable); and
- Results verification and reported detection limits.

Based on the results of data validation, the validated analytical results reported by the laboratory will be assigned one of the following usability flags:

- "U" - Not detected. The associated number indicates the approximate sample concentration necessary to be detected significantly greater than the level of the highest associated blank;
- "UJ" - Not detected. Quantitation limit may be inaccurate or imprecise;
- "J" - Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method
- "N" – Tentative identification. Analyte is considered present in the sample;
- "R" – Unreliable result; data is rejected or unusable. Analyte may or may not be present in the sample; and
- No Flag - Result accepted without qualification.

6.0 QUALITY ASSURANCE PERFORMANCE AND SYSTEM AUDITS

6.1 INTRODUCTION

Quality assurance audits may be performed by the project quality assurance group under the direction and approval of the QAO. These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s). Functioning as an independent body and reporting directly to corporate quality assurance management, the QAO may plan, schedule, and approve system and performance audits based upon procedures customized to the project requirements. At times, the QAO may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. However, these personnel will not have responsibility for the project work associated with the performance audit.

6.2 SYSTEM AUDITS

System audits may be performed by the QAO or designated auditors, and encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory quality control procedures and associated documentation may be system audited. These audits may be performed once during the performance of the project. However, if conditions adverse to quality are detected or if the Project Manager requests, additional audits may occur.

6.3 PERFORMANCE AUDITS

The laboratory may be required to conduct an analysis of Performance Evaluation samples or provide proof that Performance Evaluation samples submitted by USEPA or a state agency have been analyzed within the past twelve months.

6.4 FORMAL AUDITS

Formal audits refer to any system or performance audit that is documented and implemented by the QA group. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklists to objectively verify that quality assurance requirements have been developed, documented, and instituted in accordance with contractual and project criteria. Formal audits may be performed on project and subcontractor work at various locations.

Audit reports will be written by auditors who have performed the site audit after gathering and evaluating all data. Items, activities, and documents determined by lead auditors to be in noncompliance shall be identified at exit interviews conducted with the involved management. Non-compliances will be logged, and documented through audit findings, which are attached to and are a part of the integral audit report. These audit-finding forms are directed to management to satisfactorily resolve the noncompliance in a specified and timely manner.

The Project Manager has overall responsibility to ensure that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports must be submitted to the Project Manager within fifteen days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the QAO prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the QAO will close out the audit report and findings.

7.0 CORRECTIVE ACTION

7.1 INTRODUCTION

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected.

7.2 PROCEDURE DESCRIPTION

When a significant condition adverse to quality is noted at site, laboratory, or subcontractor location, the cause of the condition will be determined and corrective action will be taken to preclude repetition. Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO, Project Manager, Field Team Leader and involved contractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action.

All project personnel have the responsibility, as part of the normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality. Corrective actions will be initiated as follows:

- When predetermined acceptance standards are not attained;
- When procedure or data compiled are determined to be deficient;
- When equipment or instrumentation is found to be faulty;
- When samples and analytical test results are not clearly traceable;
- When quality assurance requirements have been violated;
- When designated approvals have been circumvented;
- As a result of system and performance audits;
- As a result of a management assessment;
- As a result of laboratory/field comparison studies; and
- As required by USEPA SW-846, and subsequent updates, or by the NYSDEC ASP.

Project management and staff, such as field investigation teams, remedial response planning personnel, and laboratory groups, monitor on-going work performance in the normal course of daily responsibilities. Work may be audited at the sites, laboratories, or contractor locations. Activities, or documents ascertained to be noncompliant with quality assurance requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the Task Manager.

Personnel assigned to quality assurance functions will have the responsibility to issue and control Corrective Action Request (CAR) Forms (Figure 4 or similar). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered. The CAR is issued to the personnel responsible for the affected item or activity. A copy is also submitted to the Project Manager. The individual to whom the CAR is addressed returns the requested response promptly to the QA personnel, affixing his/her signature and date to the corrective action block, after stating the cause of the conditions and corrective action to be taken. The QA personnel maintain the log for status of CARs, confirms the adequacy of the intended corrective action, and verifies its implementation. CARs will be retained in the project file for the records.

Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The Project Manager will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

FIGURE 7.1

CORRECTIVE ACTION REQUEST

Number: ________________________ Date: ___________

TO: ______________________________________

You are hereby requested to take corrective actions indicated below and as otherwise determined by you to (a) resolve the noted condition and (b) to prevent it from recurring. Your written response is to be returned to the project quality assurance manager by ______________

CONDITION:

REFERENCE DOCUMENTS:

RECOMMENDED CORRECTIVE ACTIONS:

Originator	Date	Approval	Date	Approval	Date
__________	______	__________	________	___________	________

RESPONSE

CAUSE OF CONDITION

CORRECTIVE ACTION

(A) RESOLUTION

(B) PREVENTION

(C) AFFECTED DOCUMENTS

C.A. FOLLOWUP:

CORRECTIVE ACTION VERIFIED BY: __________________________ DATE:____________

8.0 REFERENCES

NYSDEC. Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances, dated January, 2021.

NYSDEC. Division of Environmental Remediation. DER-10/Technical Guidance for Site Investigation and Remediation, dated May 3, 2010.

NYSDOH. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.

Taylor, J. K., 1987. Quality Assurance of Chemical Measurements. Lewis Publishers, Inc., Chelsea, Michigan

USEPA, 1996. EQASOP-GW4 "Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Sample from Monitoring Wells," dated July 30, 1996, revised September 19, 2017. U.S. Environmental Protection Agency, Washington, D.C.

USEPA, 1986. SW-846 "Test Method for Evaluating Solid Waste," dated November 1986. U.S. Environmental Protection Agency, Washington, D.C.

USEPA, 1987. Data Quality Objectives for Remedial Response Actions Activities: Development Process, EPA/540/G-87/003, OSWER Directive 9355.0-7- U.S. Environmental Protection Agency, Washington, D.C.

USEPA, 1992a. CLP Organics Data Review and Preliminary Review. SOP No. HW-6, Revision #8, dated January 1992. USEPA Region II.

USEPA, 1992b. Evaluation of Metals Data for the Contract Laboratory Program (CLP) based on SOW 3/90. SOP No. HW-2, Revision XI, dated January 1992. USEPA Region II.

USEPA. Hazardous Waste Support Section. Analysis of Volatile Organic Compounds in Air Contained in Canisters by Method TO-15. SOP No. HW-31, Revision #6, dated June 2014.

ATTACHMENT A

Laboratory Reporting Limits and Minimum Detection Limits

APPENDIX A

SOIL SAMPLES
LABORATORY REPORTING LIMITS AND METHOD DETECTION LIMITS

Method	Matrix	Analyte	RL	MDL	Units
		Volatile Organic Compounds			
EPA 8260C/5035	Soil	1,1,1,2-Tetrachloroethane	0.001	0.000318	mg/kg
EPA 8260C/5035	Soil	1,1,1-Trichloroethane	0.001	0.0001108	mg/kg
EPA 8260C/5035	Soil	1,1,2,2-Tetrachloroethane	0.001	0.0001008	mg/kg
EPA 8260C/5035	Soil	1,1,2-Trichloro-1,2,2-Trifluoroethane	0.02	0.000274	mg/kg
EPA 8260C/5035	Soil	1,1,2-Trichloroethane	0.0015	0.000304	mg/kg
EPA 8260C/5035	Soil	1,1-Dichloroethane	0.0015	0.0000856	mg/kg
EPA 8260C/5035	Soil	1,1-Dichloroethene	0.001	0.000262	mg/kg
EPA 8260C/5035	Soil	1,1-Dichloropropene	0.005	0.0001414	mg/kg
EPA 8260C/5035	Soil	1,2,3-Trichlorobenzene	0.005	0.0001476	mg/kg
EPA 8260C/5035	Soil	1,2,3-Trichloropropane	0.01	0.0001626	mg/kg
EPA 8260C/5035	Soil	1,2,4,5-Tetramethylbenzene	0.004	0.0001302	mg/kg
EPA 8260C/5035	Soil	1,2,4-Trichlorobenzene	0.005	0.0001818	mg/kg
EPA 8260C/5035	Soil	1,2,4-Trimethylbenzene	0.005	0.0001414	mg/kg
EPA 8260C/5035	Soil	1,2-Dibromo-3-chloropropane	0.005	0.000396	mg/kg
EPA 8260C/5035	Soil	1,2-Dibromoethane	0.004	0.0001744	mg/kg
EPA 8260C/5035	Soil	1,2-Dichlorobenzene	0.005	0.0001532	mg/kg
EPA 8260C/5035	Soil	1,2-Dichloroethane	0.001	0.0001134	mg/kg
EPA 8260C/5035	Soil	1,2-Dichloropropane	0.0035	0.000228	mg/kg
EPA 8260C/5035	Soil	1,3,5-Trimethylbenzene	0.005	0.0001434	mg/kg
EPA 8260C/5035	Soil	1,3-Dichlorobenzene	0.005	0.000135	mg/kg
EPA 8260C/5035	Soil	1,3-Dichloropropane	0.005	0.0001452	mg/kg
EPA 8260C/5035	Soil	1,4-Dichlorobenzene	0.005	0.0001384	mg/kg
EPA 8260C/5035	Soil	1,4-Diethylbenzene	0.004	0.0001598	mg/kg
EPA 8260C/5035	Soil	1,4-Dioxane	0.1	0.01442	mg/kg
EPA 8260C/5035	Soil	2,2-Dichloropropane	0.005	0.000226	mg/kg
EPA 8260C/5035	Soil	2-Butanone	0.01	0.000272	mg/kg
EPA 8260C/5035	Soil	2-Hexanone	0.01	0.000666	mg/kg
EPA 8260C/5035	Soil	4-Ethyltoluene	0.004	0.000124	mg/kg
EPA 8260C/5035	Soil	4-Methyl-2-pentanone	0.01	0.000244	mg/kg
EPA 8260C/5035	Soil	Acetone	0.01	0.001036	mg/kg
EPA 8260C/5035	Soil	Acrolein	0.025	0.00806	mg/kg
EPA 8260C/5035	Soil	Acrylonitrile	0.01	0.000514	mg/kg
EPA 8260C/5035	Soil	Benzene	0.001	0.000118	mg/kg
EPA 8260C/5035	Soil	Bromobenzene	0.005	0.000208	mg/kg
EPA 8260C/5035	Soil	Bromochloromethane	0.005	0.000276	mg/kg
EPA 8260C/5035	Soil	Bromodichloromethane	0.001	0.0001732	mg/kg
EPA 8260C/5035	Soil	Bromoform	0.004	0.000236	mg/kg
EPA 8260C/5035	Soil	Bromomethane	0.002	0.000338	mg/kg
EPA 8260C/5035	Soil	Carbon disulfide	0.01	0.001102	mg/kg
EPA 8260C/5035	Soil	Carbon tetrachloride	0.001	0.00021	mg/kg
EPA 8260C/5035	Soil	Chlorobenzene	0.001	0.000348	mg/kg
EPA 8260C/5035	Soil	Chloroethane	0.002	0.000316	mg/kg
EPA 8260C/5035	Soil	Chloroform	0.0015	0.00037	mg/kg
EPA 8260C/5035	Soil	Chloromethane	0.005	0.000294	mg/kg
EPA 8260C/5035	Soil	cis-1,2-Dichloroethene	0.001	0.0001428	mg/kg
EPA 8260C/5035	Soil	cis-1,3-Dichloropropene	0.001	0.0001176	mg/kg
EPA 8260C/5035	Soil	Cyclohexane	0.02	0.000146	mg/kg
EPA 8260C/5035	Soil	Dibromochloromethane	0.001	0.0001536	mg/kg
EPA 8260C/5035	Soil	Dibromomethane	0.01	0.0001636	mg/kg
EPA 8260C/5035	Soil	Dichlorodifluoromethane	0.01	0.0001908	mg/kg
EPA 8260C/5035	Soil	Ethyl ether	0.005	0.00026	mg/kg
EPA 8260C/5035	Soil	Ethylbenzene	0.001	0.0001274	mg/kg
EPA 8260C/5035	Soil	Hexachlorobutadiene	0.005	0.000228	mg/kg
EPA 8260C/5035	Soil	Isopropylbenzene	0.001	0.0001038	mg/kg
EPA 8260C/5035	Soil	Methyl Acetate	0.02	0.00027	mg/kg
EPA 8260C/5035	Soil	Methyl cyclohexane	0.004	0.0001546	mg/kg
EPA 8260C/5035	Soil	Methyl tert butyl ether	0.002	0.0000844	mg/kg
EPA 8260C/5035	Soil	Methylene chloride	0.01	0.001104	mg/kg
EPA 8260C/5035	Soil	Naphthalene	0.005	0.0001384	mg/kg
EPA 8260C/5035	Soil	n-Butylbenzene	0.001	0.0001148	mg/kg
EPA 8260C/5035	Soil	n-Propylbenzene	0.001	0.0001092	mg/kg
EPA 8260C/5035	Soil	o-Chlorotoluene	0.005	0.0001598	mg/kg
EPA 8260C/5035	Soil	o-Xylene	0.002	0.0001718	mg/kg
EPA 8260C/5035	Soil	p/m-Xylene	0.002	0.0001978	mg/kg
EPA 8260C/5035	Soil	p-Chlorotoluene	0.005	0.0001328	mg/kg
EPA 8260C/5035	Soil	p-Isopropyltoluene	0.001	0.000125	mg/kg
EPA 8260C/5035	Soil	sec-Butylbenzene	0.001	0.000122	mg/kg
EPA 8260C/5035	Soil	Styrene	0.002	0.000402	mg/kg
EPA 8260C/5035	Soil	tert-Butyl Alcohol	0.06	0.00292	mg/kg
EPA 8260C/5035	Soil	tert-Butylbenzene	0.005	0.0001354	mg/kg
EPA 8260C/5035	Soil	Tetrachloroethene	0.001	0.0001402	mg/kg
EPA 8260C/5035	Soil	Toluene	0.0015	0.0001948	mg/kg
EPA 8260C/5035	Soil	trans-1,2-Dichloroethene	0.0015	0.000212	mg/kg
EPA 8260C/5035	Soil	trans-1,3-Dichloropropene	0.001	0.0001208	mg/kg
EPA 8260C/5035	Soil	trans-1,4-Dichloro-2-butene	0.005	0.000392	mg/kg
EPA 8260C/5035	Soil	Trichloroethene	0.001	0.000125	mg/kg
EPA 8260C/5035	Soil	Trichlorofluoromethane	0.005	0.000388	mg/kg
EPA 8260C/5035	Soil	Vinyl acetate	0.01	0.0001322	mg/kg
EPA 8260C/5035	Soil	Vinyl chloride	0.002	0.0001174	mg/kg
EPA 8260C/5035	Soil	Xylenes, Total	0.002	0.0001978	mg/kg

APPENDIX A

SOIL SAMPLES
LABORATORY REPORTING LIMITS AND METHOD DETECTION LIMITS

Method	Matrix	Analyte	RL	MDL	Units
Semivolatile Organic Compounds					
EPA 8270D	Soil	1,2,4,5-Tetrachlorobenzene	0.1665	0.0515817	mg/kg
EPA 8270D	Soil	1,2,4-Trichlorobenzene	0.1665	0.0545787	mg/kg
EPA 8270D	Soil	1,2-Dichlorobenzene	0.1665	0.0546453	mg/kg
EPA 8270D	Soil	1,3-Dichlorobenzene	0.1665	0.0524808	mg/kg
EPA 8270D	Soil	1,4-Dichlorobenzene	0.1665	0.050616	mg/kg
EPA 8270D	Soil	2,3,4,6-Tetrachlorophenol	0.1665	0.028305	mg/kg
EPA 8270D	Soil	2,4,5-Trichlorophenol	0.1665	0.053946	mg/kg
EPA 8270D	Soil	2,4,6-Trichlorophenol	0.0999	0.0314019	mg/kg
EPA 8270D	Soil	2,4-Dichlorophenol	0.14985	0.053946	mg/kg
EPA 8270D	Soil	2,4-Dimethylphenol	0.1665	0.049617	mg/kg
EPA 8270D	Soil	2,4-Dinitrophenol	0.7992	0.227772	mg/kg
EPA 8270D	Soil	2,4-Dinitrotoluene	0.1665	0.0359307	mg/kg
EPA 8270D	Soil	2,6-Dinitrotoluene	0.1665	0.042624	mg/kg
EPA 8270D	Soil	2-Chloronaphthalene	0.1665	0.054279	mg/kg
EPA 8270D	Soil	2-Chlorophenol	0.1665	0.050283	mg/kg
EPA 8270D	Soil	2-Methylnaphthalene	0.1998	0.0531801	mg/kg
EPA 8270D	Soil	2-Methylphenol	0.1665	0.053613	mg/kg
EPA 8270D	Soil	2-Nitroaniline	0.1665	0.046953	mg/kg
EPA 8270D	Soil	2-Nitrophenol	0.35964	0.051948	mg/kg
EPA 8270D	Soil	3,3'-Dichlorobenzidine	0.1665	0.044289	mg/kg
EPA 8270D	Soil	3-Methylphenol/4-Methylphenol	0.23976	0.054612	mg/kg
EPA 8270D	Soil	3-Nitroaniline	0.1665	0.045954	mg/kg
EPA 8270D	Soil	4,6-Dinitro-o-cresol	0.4329	0.060939	mg/kg
EPA 8270D	Soil	4-Bromophenyl phenyl ether	0.1665	0.038295	mg/kg
EPA 8270D	Soil	4-Chloroaniline	0.1665	0.043956	mg/kg
EPA 8270D	Soil	4-Chlorophenyl phenyl ether	0.1665	0.0506493	mg/kg
EPA 8270D	Soil	4-Nitroaniline	0.1665	0.044955	mg/kg
EPA 8270D	Soil	4-Nitrophenol	0.2331	0.053946	mg/kg
EPA 8270D	Soil	Acenaphthene	0.1332	0.034299	mg/kg
EPA 8270D	Soil	Acenaphthylene	0.1332	0.0311355	mg/kg
EPA 8270D	Soil	Acetophenone	0.1665	0.051615	mg/kg
EPA 8270D	Soil	Anthracene	0.0999	0.0277056	mg/kg
EPA 8270D	Soil	Atrazine	0.1332	0.0377289	mg/kg
EPA 8270D	Soil	Azobenzene	0.1665	0.044622	mg/kg
EPA 8270D	Soil	Benzaldehyde	0.21978	0.067266	mg/kg
EPA 8270D	Soil	Benzidine	0.54945	0.130203	mg/kg
EPA 8270D	Soil	Benzo(a)anthracene	0.0999	0.0326007	mg/kg
EPA 8270D	Soil	Benzo(a)pyrene	0.1332	0.0407259	mg/kg
EPA 8270D	Soil	Benzo(b)fluoranthene	0.0999	0.033633	mg/kg
EPA 8270D	Soil	Benzo(ghi)perylene	0.1332	0.034632	mg/kg
EPA 8270D	Soil	Benzo(k)fluoranthene	0.0999	0.0317682	mg/kg
EPA 8270D	Soil	Benzoic Acid	0.53946	0.168498	mg/kg
EPA 8270D	Soil	Benzyl Alcohol	0.1665	0.051282	mg/kg
EPA 8270D	Soil	Biphenyl	0.37962	0.0549117	mg/kg
EPA 8270D	Soil	Bis(2-chloroethoxy)methane	0.17982	0.0504162	mg/kg
EPA 8270D	Soil	Bis(2-chloroethyl)ether	0.14985	0.0466866	mg/kg
EPA 8270D	Soil	Bis(2-chloroisopropyl)ether	0.1998	0.058608	mg/kg
EPA 8270D	Soil	Bis(2-Ethylhexyl)phthalate	0.1665	0.043623	mg/kg
EPA 8270D	Soil	Butyl benzyl phthalate	0.1665	0.0325341	mg/kg
EPA 8270D	Soil	Caprolactam	0.1665	0.045954	mg/kg
EPA 8270D	Soil	Carbazole	0.1665	0.0357975	mg/kg
EPA 8270D	Soil	Chrysene	0.0999	0.0327006	mg/kg
EPA 8270D	Soil	Dibenzo(a,h)anthracene	0.0999	0.0322344	mg/kg
EPA 8270D	Soil	Dibenzofuran	0.1665	0.0555777	mg/kg
EPA 8270D	Soil	Diethyl phthalate	0.1665	0.0351981	mg/kg
EPA 8270D	Soil	Dimethyl phthalate	0.1665	0.042291	mg/kg
EPA 8270D	Soil	Di-n-butylphthalate	0.1665	0.0321345	mg/kg
EPA 8270D	Soil	Di-n-octylphthalate	0.1665	0.040959	mg/kg
EPA 8270D	Soil	Fluoranthene	0.0999	0.0305694	mg/kg
EPA 8270D	Soil	Fluorene	0.1665	0.0477189	mg/kg
EPA 8270D	Soil	Hexachlorobenzene	0.0999	0.0310356	mg/kg
EPA 8270D	Soil	Hexachlorobutadiene	0.1665	0.046953	mg/kg
EPA 8270D	Soil	Hexachlorocyclopentadiene	0.47619	0.106893	mg/kg
EPA 8270D	Soil	Hexachloroethane	0.1332	0.0302697	mg/kg
EPA 8270D	Soil	Indeno(1,2,3-cd)Pyrene	0.1332	0.036963	mg/kg
EPA 8270D	Soil	Isophorone	0.14985	0.044289	mg/kg
EPA 8270D	Soil	Naphthalene	0.1665	0.055278	mg/kg
EPA 8270D	Soil	Nitrobenzene	0.14985	0.039627	mg/kg
EPA 8270D	Soil	NitrosoDiPhenylAmine(NDPA)/DPA	0.1332	0.034965	mg/kg
EPA 8270D	Soil	n-Nitrosodimethylamine	0.333	0.0539127	mg/kg
EPA 8270D	Soil	n-Nitrosodi-n-propylamine	0.1665	0.049617	mg/kg
EPA 8270D	Soil	P-Chloro-M-Cresol	0.1665	0.048285	mg/kg
EPA 8270D	Soil	Pentachlorophenol	0.1332	0.035631	mg/kg
EPA 8270D	Soil	Phenanthrene	0.0999	0.0325674	mg/kg
EPA 8270D	Soil	Phenol	0.1665	0.049284	mg/kg
EPA 8270D	Soil	Pyrene	0.0999	0.0323676	mg/kg

APPENDIX A

SOIL SAMPLES
LABORATORY REPORTING LIMITS AND METHOD DETECTION LIMITS

Method	Matrix	Analyte	RL	MDL	Units
Pesticides					
EPA 8081B	Soil	4,4'-DDD	0.007992	0.00285048	mg/kg
EPA 8081B	Soil	4,4'-DDE	0.007992	0.00184815	mg/kg
EPA 8081B	Soil	4,4'-DDT	0.014985	0.0064269	mg/kg
EPA 8081B	Soil	Aldrin	0.007992	0.00281385	mg/kg
EPA 8081B	Soil	Alpha-BHC	0.00333	0.00094572	mg/kg
EPA 8081B	Soil	Beta-BHC	0.007992	0.0030303	mg/kg
EPA 8081B	Soil	Chlordane	0.064935	0.0264735	mg/kg
EPA 8081B	Soil	cis-Chlordane	0.00999	0.00278388	mg/kg
EPA 8081B	Soil	Delta-BHC	0.007992	0.0015651	mg/kg
EPA 8081B	Soil	Dieldrin	0.004995	0.0024975	mg/kg
EPA 8081B	Soil	Endosulfan I	0.007992	0.00188811	mg/kg
EPA 8081B	Soil	Endosulfan II	0.007992	0.00267066	mg/kg
EPA 8081B	Soil	Endosulfan sulfate	0.00333	0.00158508	mg/kg
EPA 8081B	Soil	Endrin	0.00333	0.0013653	mg/kg
EPA 8081B	Soil	Endrin aldehyde	0.00999	0.0034965	mg/kg
EPA 8081B	Soil	Endrin ketone	0.007992	0.00205794	mg/kg
EPA 8081B	Soil	Heptachlor	0.003996	0.00179154	mg/kg
EPA 8081B	Soil	Heptachlor epoxide	0.014985	0.0044955	mg/kg
EPA 8081B	Soil	Lindane	0.00333	0.00148851	mg/kg
EPA 8081B	Soil	Methoxychlor	0.014985	0.004662	mg/kg
EPA 8081B	Soil	Toxaphene	0.14985	0.041958	mg/kg
EPA 8081B	Soil	trans-Chlordane	0.00999	0.00263736	mg/kg
Polychlorinated Biphenyls					
EPA 8082A	Soil	Aroclor 1016	0.0335	0.0026465	mg/kg
EPA 8082A	Soil	Aroclor 1221	0.0335	0.0030887	mg/kg
EPA 8082A	Soil	Aroclor 1232	0.0335	0.0039262	mg/kg
EPA 8082A	Soil	Aroclor 1242	0.0335	0.0041004	mg/kg
EPA 8082A	Soil	Aroclor 1248	0.0335	0.0028274	mg/kg
EPA 8082A	Soil	Aroclor 1254	0.0335	0.0027537	mg/kg
EPA 8082A	Soil	Aroclor 1260	0.0335	0.0025527	mg/kg
EPA 8082A	Soil	Aroclor 1262	0.0335	0.0016616	mg/kg
EPA 8082A	Soil	Aroclor 1268	0.0335	0.0048575	mg/kg
EPA 8082A	Soil	Total PCBs	0.0335	0.0016616	mg/kg
Herbicides					
EPA 8151A	Soil	2,4-D	0.1665	0.0051615	mg/kg
EPA 8151A	Soil	2,4,5-TP (Silvex)	0.1665	0.0044289	mg/kg
EPA 8151A	Soil	2,4,5-T	0.1665	0.0104895	mg/kg
Metals					
EPA 6010C	Soil	Aluminum	4	0.8	mg/kg
EPA 6010C	Soil	Antimony	2	0.32	mg/kg
EPA 6010C	Soil	Arsenic	0.4	0.08	mg/kg
EPA 6010C	Soil	Barium	0.4	0.12	mg/kg
EPA 6010C	Soil	Beryllium	0.2	0.04	mg/kg
EPA 6010C	Soil	Cadmium	0.4	0.028	mg/kg
EPA 6010C	Soil	Calcium	4	1.2	mg/kg
EPA 6010C	Soil	Chromium	0.4	0.08	mg/kg
EPA 7196A	Soil	Hexvalent Chromium	0.8	0.16	mg/kg
EPA 6010C	Soil	Cobalt	0.8	0.2	mg/kg
EPA 6010C	Soil	Copper	0.4	0.08	mg/kg
EPA 6010C	Soil	Iron	2	0.8	mg/kg
EPA 6010C	Soil	Lead	2	0.08	mg/kg
EPA 6010C	Soil	Magnesium	4	0.4	mg/kg
EPA 6010C	Soil	Manganese	0.4	0.08	mg/kg
EPA 7473	Soil	Mercury	0.08	0.016896	mg/kg
EPA 6010C	Soil	Nickel	1	0.16	mg/kg
EPA 6010C	Soil	Potassium	100	16	mg/kg
EPA 6010C	Soil	Selenium	0.8	0.12	mg/kg
EPA 6010C	Soil	Silver	0.4	0.08	mg/kg
EPA 6010C	Soil	Sodium	80	12	mg/kg
EPA 6010C	Soil	Thallium	0.8	0.16	mg/kg
EPA 6010C	Soil	Vanadium	0.4	0.04	mg/kg
EPA 6010C	Soil	Zinc	2	0.28	mg/kg
PFAS Compounds					
EPA 537M	Soil	Perfluorohexanoic acid (PFHxA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluoroheptanoic acid (PFHpA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorooctanoic acid (PFOA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorobutanoic acid (PFBA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluoropentanoic acid (PFPeA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorononanoic acid (PFNA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorodecanoic acid (PFDA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluoroundecanoic acid (PFUdA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorododecanoic acid (PFDoA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorotridecanoic Acid (PRTrDA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorotetradecanoic acid (PFTA)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorobutanesulfonic acid (PFBS)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorohexanesulfonic acid (PFHxS)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluoroheptanesulfonic acid (PFHpS)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorooctanesulfonic acid (PFOS)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorodecanesulfonic Acid (PFDS)	0.5	0.5	ug/kg
EPA 537M	Soil	1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2 FTS)	0.5	0.5	ug/kg
EPA 537M	Soil	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTS)	0.5	0.5	ug/kg
EPA 537M	Soil	Perfluorooctanesulfonamide (FOSA)	0.5	0.5	ug/kg
EPA 537M	Soil	N-methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA)	0.5	0.5	ug/kg
EPA 537M	Soil	N-ethyl perfluorooctanesulfonamidoacetic acid (EtFOSAA)	0.5	0.5	ug/kg
EPA 8720D SIM	Soil	1,4-Dioxane	10	2	ug/kg

ATTACHMENT B
Analytical Methods/Quality Assurance Summary Table

ATTACHMENT B

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE

Matrix Type	Field Parameters	Laboratory Parameters	Analytical Methods	Sample Preservation	Sample Container Volume and Type	Sample Hold Time	Field Duplicate Samples	Equipment Blank Samples	Trip Blank Samples	Ambient Air Samples	MS/MSD Samples
Groundwater	Temperature, Turbidity, pH, ORP, Conductivity	Part 375 + TCL VOCs	EPA 8260C	Cool to 4°C; HCl to pH <2;no headspace	Three 40-mL VOC vials with Teflon®-lined cap	Analyze within 14 days of collection	1 per 20 samples (minimum 1)	1 per 20 samples (minimum 1)	1 per shipment of VOC samples	NA	1 per 20 samples
		1,4-dioxane	8270D SIM isotope dilution	Cool to 4°C	One 1-Liter Amber Glass	7 days to extract, 40 days after extraction to analysis					
		Part 375 + TCL SVOCs	EPA 8270D	Cool to 4°C	Two 1-Liter Amber Glass	7 days to extract, 40 days after extraction to analysis					
		Part 375 + TAL Metals	EPA 6020B, EPA 7470A	Cool to 4°C; HNO_3	250 ml plastic	6 months, except Mercury 28 days					
		Hexavalent Chromium	EPA 7196A	Cool to 4°C	250 ml plastic	24 hours					
		Cyanide	EPA 9010C/9012B	Cool to 4°C; NaOH plus 0.6g ascorbic acid	250 ml plastic	14 days					
		Part 375 + TCL Herbicides	EPA 8151A	Cool to 4°C	Two 1-Liter Amber Glass	7 days to extract, 40 days after extraction to analysis					
		Part 375 + TCL Pesticides	EPA 8081B	Cool to 4°C	Two 1-Liter Amber Glass for Pesticides/PCB	7 days to extract, 40 days after extraction to analysis					
		PCBs	EPA 8082A	Cool to 4°C		7 days to extract, 40 days after extraction to analysis					
		Per- and polyfluoroalykl substances (PFAS)	EPA 537(M) Rev 1.1	Cool to 4°C, Trizma	Two 250 mL high density polyethylene (HDPE) bottles	14 days	1 per 20 samples (minimum 1)	1 per 20 samples (minimum 1)	N/A	N/A	1 per 20 samples (minimum 1)

ATTACHMENT B

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE

Matrix Type	Field Parameters	Laboratory Parameters	Analytical Methods	Sample Preservation	Sample Container Volume and Type	Sample Hold Time	Field Duplicate Samples	Equipment Blank Samples	Trip Blank Samples	Ambient Air Samples	MS/MSD Samples
Soil	Total VOCs via PID	Part 375 + TCL VOCs	EPA 8260C	Cool to 4°C	Two 40-ml VOC vials with 5ml H_2O, one with MeOH (separate container for % solids)	48 hours after sampling if samples are not frozen to -7° C, 14 days after extraction to analysis	1 per 20 samples (minimum 1)	1 per 20 samples (minimum 1)	NA	NA	1 per 20 samples
		Part 375 + TCL SVOCs	EPA 8270D	Cool to 4°C	4 oz. amber glass jar	14 days extract, 40 days after extraction to analysis					
		Part 375 + TAL Metals	EPA 6010D, EPA 7471B, EPA 7196A, EPA 9010C/9012B	Cool to 4°C	2 oz. amber glass jar	6 months, except mercury 28 days					
		Part 375 + TCL Pesticides	EPA 8081B	Cool to 4°C	4 oz. amber glass jar	14 days extract, 40 days after extraction to analysis					
		Part 375 + TCL Herbicides	EPA 8151A	Cool to 4°C	4 oz. amber glass jar	14 days extract					
		Part 375 + TCL PCBs	EPA 8082A	Cool to 4°C	4 oz. amber glass jar	14 days extract, 40 days after extraction to analysis					
		Per- and polyfluoroalykl substances (PFAS)	EPA 537(M) Rev 1.1	Cool to 4°C, Trizma	2 oz. amber glass jar	14 days					
Product	N/A	Petrleum Hydrocarbon Identification (PHI)	EPA 8015D(M)	Cool to 4°C	4 oz. amber glass jar	14 days extract, 40 days after extraction to analysis	N/A	N/A	N/A	N/A	N/A
		Density	ASTM D1475	Cool to 4°C	4 oz. amber glass jar	N/A	N/A	N/A	N/A	N/A	N/A
		Viscosity	ASTM D445	Cool to 4°C	4 oz. amber glass jar	N/A	N/A	N/A	N/A	N/A	N/A
Soil Vapor	Total VOCs and Methane with MultiGas Meter	TO-15 Listed VOCs	TO-15	Ambient Temperature	6-Liter Summa Canister	Analyze within 30 days of collection	1 per 20 samples (minimum 1)	NA	NA	1 per 10 samples (minimum 1)	NA
Ambient Air	Total VOCs via PID	TO-15 Listed VOCs	TO-15	Ambient Temperature	6-Liter Summa Canister	Analyze within 30 days of collection	1 per 20 samples (minimum 1)	NA	NA	1 per 10 samples (minimum 1)	NA

Notes:
1. PID - Photoionization Detector
2. VOC - Volatile organic compound
3. EPA - Environmental Protection Agency
4. TCL - Target compound list
5. TAL - Target analyte list

ATTACHMENT C
Resumes

William Bohrer

Project Geologist
Geologist

32 years in the industry

Mr. Bohrer is an experienced geologist responsible for managing Langan's environmental standards and Health and Safety compliance for projects throughout New York City. His services include dissemination of environmental protocols, troubleshooting at project sites, in-house/field training, and maintenance of quality standards across the environmental discipline. Mr. Bohrer has a diverse and extensive background in geophysics, hydrogeology, mining and petroleum, and geotechnical engineering. He has developed conceptual site models for public, industrial and commercial facilities nationwide.

Selected Projects

NYU Poly – 122 Johnson Street, Brooklyn, NY
Con Edison of New York at Governor's Island, NY, NY
535 4th Avenue, Brooklyn, NY
27 Wooster Street, New York, NY
42 West Street, Brooklyn, NY
455 West 19th Street, New York, NY
Kings Plaza Mall, Brooklyn, NY
Hudson Yards "Terra Firma", New York, NY
Hudson Yards, Platform Special Inspection, New York, NY
PSAC II, Bronx, NY
595-647 Smith Street, Brooklyn, NY
New York University, 7-13 Washington Square North Investigation
New York, NY
New York University, 4 Washington Square Village, New York, NY
125th Street and Lenox Avenue, New York, NY
Sullivan Street Development, New York, NY
Hudson Crossing II, New York, NY
New York Aquarium, Shark Tank & Animal Care Facility, Brooklyn, NY
209-219 Sullivan Street, New York, NY
261 Hudson Street, New York, NY
460 Washington Street, New York, NY
552 West 24th Street, New York, NY
Brooklyn Bridge Park Pier 1, New York, NY
International Leadership Bronx Charter School, Bronx, NY
203 East 92nd Street, New York, NY
HighLine 28-29, New York, NY
539 Smith Street Bulkhead, Brooklyn, NY
Willets Point, Corona, NY
Plume Migration and Fracture Flow Aquifer Investigation, Brunswick, MD
Plume Migration and Fracture Flow Aquifer Investigation, Fallston, MD

Education

Post Graduate Studies in Geophysics
Cornell University

B.S., Geology
Tufts University

Professional Registration

40 Hour OSHA HazWOPER

OSHA Construction Safety & Health

OSHA Supervisory Certification
Credential (TWIC)

Transportation Worker Identification

NYS DEC- Protecting New York's
Natural Resources with Better
Construction Site Management"

Affiliations

American Association of Petroleum
Geologists

National Groundwater Association

Geological Society of America

PA Council of Professional Geologists

LANGAN

Emergency Response Site Investigation & Remediation,
Wappingers Falls, NY
Emergency Response Site Investigation & Remediation, Allentown, PA
Emergency Response Site Investigation & Remediation, Shamokin, PA
Bermuda International Airport, Jet Fuel Release Investigation, Bermuda
Little Missouri River Basin, Geotechnical Site Evaluation (Horizontal Drilling Pipeline Install), ND
Seismic Susceptibility Evaluation (Class 2 Injection Wells), Litchfield, OH
Bedrock Mapping, Bradford and Sullivan Counties, PA
Soil Solidification, Carteret, NJ

JOSEPH CONBOY

STAFF CHEMIST

ENVIRONMNETAL

Mr. Conboy has seven years of environmental chemistry, quality assurance, and environmental database management experience, with a current emphasis on validation of laboratory data for submittal to NJDEP via the New Jersey Data of Known Quality Protocols and to NYSDEC. Previous work experience includes performing validation of data for projects in USEPA Regions 2 and 3 while employing appropriate validation guidelines for each region, managing large data sets, updating appropriate regulatory limits, performing statistical evaluations, and preparing electronic data deliverables and report deliverables using the Earthsoft EQuIS database program, and acted as an intermediary between project managers, field staff, and laboratories. Mr. Conboy also has experience in field sampling techniques and maintains current OSHA HAZWOPER certification.

SELECTED PROJECTS

- 1400 Ferris, Bronx, NY – Completed validation of soil and groundwater data and prepared the Data Usability Summary Report for submittal to NYSDEC. USEPA Region II guidelines, with aide from National Functional Guidelines, were employed to perform validation of VOCs and SVOCs including 1,4-dioxane, and tangentially used based on professional judgment to perform validation of PFAS data.
- Broome Street Parking Lot, NY - Completed validation of waste characterization data and prepared the Data Usability Summary Report for submittal to NYSDEC. USEPA Region II guidelines, with aide from National Functional Guidelines, were employed to perform validation of VOCs, SVOCs, herbicides, PCBs, pesticides, metals including mercury, ignitability temperature, pH, reactive cyanide, reactive sulfide, cyanide, and hexavalent chromium. Toxicity characteristic leachate procedure extraction data for VOCs, SVOCs, herbicides, pesticides, metals, and mercury were also validated.
- 215 North 10th Street, Brooklyn, NY - Completed validation of soil and groundwater data and prepared the Data Usability Summary Report for submittal to NYSDEC. USEPA Region II guidelines, with aide from National Functional Guidelines, were employed to perform validation of VOC, SVOC, SVOC SIM, herbicide, PCB, pesticide, metals, mercury, cyanide, hexavalent chromium, trivalent chromium data.
- 35 Commercial Street, Brooklyn, NY - Completed validation of soil data and prepared the Data Usability Summary Report for submittal to NYSDEC. USEPA Region II guidelines, with aide from National Functional Guidelines, were employed to perform validation of VOC, SVOC, SVOC SIM, herbicide, PCB, pesticide, metals, mercury, cyanide, hexavalent chromium, trivalent chromium data, and tangentially used based on professional judgment to perform validation of PFAS data.
- Suffolk Street, Lower East Side, NY- Completed validation of soil, groundwater, and soil vapor data and prepared the Data Usability Summary Report for submittal to NYSDEC. USEPA Region II

EDUCATION

B.Sc., Chemistry with a minor in Mathematics
Rowan University

CERTIFICATIONS & TRAINING

OSHA 40-Hour HAZWOPER 29 CFR 1910.120(e)(4) Certification

NJ Analytical Guidance and Data Usability Training

USEPA Data Validation Training

Earthsoft EQuIS Environmental Database Training guidelines, with aide from National Functional Guidelines, were employed to perform validation of VOC, VOCs by USEPA TO-15, SVOC, SVOC SIM, herbicide, PCB, pesticide, metals, mercury, cyanide, hexavalent chromium, trivalent chromium data, and tangentially used based on professional judgment to perform validation of PFAS data.

- Managed a database for a confidential client containing 10+ years of environmental chemical data from multiple laboratories, requiring select data validation in accordance with New Jersey Data of Known Quality Protocols and identifying areas of delineation from historic field information. Once identified, NJDEP designated groundwater, surface water, soil, sediment, soil vapor, and custom screening criteria were researched and applied to each area, requiring individualized flagging for reporting.*
- Prepared the New Jersey Data of Known Quality Protocol Data Usability Evaluation and managed the database for a confidential client for a data set greater than 20 years old. A DUE or any validation effort was not prepared in the 20 years prior to current. This included data from variations of methods for volatile organic compounds, semivolatile organic compounds, total and dissolved metals, pesticides, herbicides, natural attenuation parameters, and per- and polyfluoroalkyl substances in multiple media.*
- Performed 200+ Stage 2a validations for a combined 87-acre USEPA designated Corrective Action site under the Resource Conservation and Recovery Act, including a quick-turn USEPA required PCB by soxhlet extraction investigation across multiple plants. Once a former train car painting facility, USEPA required a quick-turn PCB by soxhlet extraction soil investigation.
- Preparation of a quality assurance program for a confidential client in West Virginia. A quick turn QAPP was prepared in a service location new to the consultant, resulting in research into state requirements for data usability and auditing newly employed laboratories. The QAPP was understood to be prepared for groundwater only, but the client did not reveal the need for sediment and soil. Two QAPPs were submitted for review to governing agencies.*
- Used statistical software to determine a localized background upper confidence limit of chromium for a confidential client's sand and gravel site. Validation was used to confirm laboratory procedures, and data was used in ProUCL calculations to compare to researched background chromium levels for Pennsylvania soils. *
- Prepared daily perimeter dust and air monitoring summaries and validation of low level mirex data for a confidential client's superfund site. Low level mirex data was generated by university laboratories and subject to validation following national functional guidelines to aide in river clean-up, including sediment, surface water, and treatment system water matrices.*

*Project completed prior to employment at LANGAN.

Michael D. Burke, CHMM, LEED AP

Principal
Environmental Engineering and Remediation

16 years in the industry

Mr. Burke is a geologist/environmental scientist whose practice involves site investigation and remediation, transactional due diligence, environmental site assessments, in-situ remedial technology, and manufactured gas plant (MGP) site characterization and remediation. His additional services include multi-media compliance audits, sub-slab depressurization system design, non-hazardous and hazardous waste management, emergency response, community air monitoring programs, environmental and geotechnical site investigations, and health and safety monitoring. He has experience with projects in the New York State Department of Environmental Conservation (NYSDEC) and New York State Brownfield Cleanup (NYS BCP) Programs; Inactive Hazardous Waste, and Spill Programs, and New York City Office of Environmental Remediation (OER) e-designated and New York City Voluntary Cleanup Program (NYC VCP) sites.

Selected Projects

227-14 North Conduit Avenue, Industrial Wastewater Compliance, Jamaica, NY
420 Kent Avenue, NYS BCP, Brooklyn, NY
572 Eleventh Avenue, NYC VCP, New York, NY
Monian Site A, OER E-Designated Site, New York, NY
537 Sackett Street, Gowanus Canal Due Diligence/MGP Site, Brooklyn, NY
ABC Blocks 25, 26 and 27, NYS BCP Sites, Long Island City, NY
432 Rodney Street, NYS BCP, Petroleum and Chlorinated Volatile Organic Compound Investigation and Remediation, Brooklyn, NY
787 Eleventh Avenue, NYS BCP Site, New York, NY
President Street at Gowanus Canal, NYS BCP Site, Brooklyn, NY
22-36 Second Avenue at Gowanus Canal, NYS BCP Site, Brooklyn, NY
563 Sacket Street, NYS BCP Site, MGP Investigation, and Remediation, Brooklyn, NY
156-162 Perry Street, NYS BCP Site, New York, NY
Christopher and Weehawken Streets, NYS BCP, New York, NY
Phelps Dodge Block 2529 (Lots 40, 50, and 45), Inactive Hazardous Waste Disposal Site, Maspeth NY
42-50 24th Street, NYS BCP Site, Long Island City, NY
Storage Deluxe (163 6th Street), OER E-Designation Site, New York, NY
Prospect Park Redevelopment, Landfill Reclamation, Prospect Park, NJ
431 Carroll Street, Gowanus Canal Due Diligence, Brooklyn, NY
76 4th Street Property, Gowanus Due Diligence, Brooklyn, NY
Foxgate/MREC, Solid Waste Compliance, Central Islip, NY
175-225 3rd Street at Gowanus Canal, NYS BCP, Brooklyn, NY
New York University Tandon School of Engineering, Spill Investigation/ Remediation Dual Phase Recovery, and Laser Fluorescence Investigation, Brooklyn, NY

Education

M.S., Environmental Geology
Rutgers University

B.S., Geological Sciences
Rutgers University

B.S., Environmental Science
Rutgers University

Professional Registration

Certified Hazardous Materials Manager – CHMM No. 15998

OSHA Certification for Hazardous Waste Site Supervisor

OSHA 29 CFR 1910.120 Certification for Hazardous Waste Operations and Emergency Response

NJDEP Certification for Community Noise Enforcement

Troxler Certification for Nuclear Densometer Training

2420-2430 Amsterdam Avenue, NYS BCP/Board of Standards and Appeals Variance, New York, NY
170 Amsterdam Avenue, NYC VCP, New York, NY
538-540 Hudson Street, NYS BCP (Former Gas Station), New York, NY
234 Butler Street, Gowanus Canal Due Diligence, Brooklyn, NY
550 Clinton Street, NYS BCP E-Designation, Brooklyn, NY
111 Leroy Street, OER E-Designation Site, New York, NY
335 Bond Street, NYS BCP, New York, NY
Gowanus Canal Northside, NYS BCP Former Fuel Oil Terminal, Brooklyn, NY
Multiple Buildings, Major Oil Storage Facility, Gowanus Canal Location, Brooklyn, NY
197-205 Smith Street at Gowanus Canal, MGP Due Diligence, Brooklyn, NY
450 Union Street at Gowanus Canal, NYS BCP, Brooklyn, NY
86 Fleet Place, NYC VCP E-Designation, Brooklyn, NY
New York University College of Nursing at 433 1st Avenue, NYS BCP, Bronx, NY
Retail Building at 225 3rd Street, Brooklyn, NY
29-37 41st Avenue, NYS BCP, Long Island City, NY
43-01 22nd Street, NYS BCP, Long Island City, NY
Compliance Audit for NYU at Washington Square Park, New York, NY
Former Watermark Locations, NYS BCP, Chlorinated Volatile Organic Compound Investigation and Remediation; AS/SVE, Brooklyn, NY
Former Gas Station (1525 Bedford Avenue), Brooklyn, NY
NYS BCP at 514 West 24th Street, New York, NY
Gowanus Canal Due Diligence at 76 4th Street, Brooklyn, NY
United Health Plan at 1095 Southern Boulevard, NYS BCP CVOC Investigation and Remediation, Bronx, NY
420 East 54th Street, NYS Spill Closure, New York, NY
Equity Residential at 160 Riverside Boulevard, NYS Spill Closure, New York, NY
357-359 West Street and 156 Leroy Street, NYC VCP, New York, NY
Emergency Spill Response at 322 West 57th Street, Investigation and Closure, New York, NY
Hurricane Sandy, Emergency Response at 21 West Street, New York, NY
Hurricane Sandy, Emergency Response at 71 Pine Street, New York, NY
Greenpoint Landing, NYC E-Designation, Brooklyn, NY
23-01 42nd Road, NYS BCP, Long Island City, NY
Greenpoint Waterfront Development, NYS BCP, Brooklyn, NY
125th Street and Lenox Avenue, NYC VCP, New York, NY
Whitehead Realty Solvent Site, Inactive Hazardous Waste site, CVOC Investigation and Remediation, Brooklyn, NY
SunCap Property Group Environmental On-Call Consulting, Various Locations, Nationwide
Consolidated Edison Company of New York, Underground Storage Tank On-Call Contract, Five Boroughs of New York City, NY
Consolidated Edison Company of New York, Appendix B Spill Sites On-Call Contract, Five Boroughs of New York City, NY
Meeker Avenue Plume Trackdown Site, Brooklyn, NY
Borden Avenue Distribution Facility, Superfund Redevelopment, Long Island City, NY
Edison Properties, West 17th Street Development Site (Former MGP Site), New York, NY
Con Edison on Governors Island, Dielectric Fluid Spill, Investigation and Remediation, New York, NY
144-150 Barrow Street, NYS BCP, New York, NY

West 17th Street Development, NYS BCP, MGP Investigation and Remediation, New York, NY
Montefiore Medical Center, Emergency Response, PCB Remediation, Bronx, NY
New York University, 4 Washington Square Village Fuel Oil Remediation, New York, NY
NYCSCA, Proposed New York City School Construction Sites, Five Boroughs of New York City, NY
Con Edison, East 60th Street Generating Station, New York, NY
Residential Building at 82 Irving Place, Environmental Remediation, New York, NY
1113 York Avenue, Storage Tank Closures, New York, NY
Peter Cooper Village/Stuyvesant Town, Phase I ESA, New York, NY
Superior Ink, Waste Characterization and Remedial Action Plans, New York, NY
Bronx Mental Health Redevelopment Project, Phase I ESA, Bronx, NY
2950 Atlantic Avenue, Site Characterization Investigation, Brooklyn, NY
Con Edison, East 74th Street Generating Station, Sediment Investigation, New York, NY
Con Edison, First Avenue Properties, New York, NY
Queens West Development Corp. Stage II, Long Island City, NY
Article X Project Environmental Reviews, Various New York State Electrical Generation Sites, NY
Poletti Generating Station, Astoria, NY
Arthur Kill Generating Station, Staten Island, NY

Jason J. Hayes, PE, LEED AP

Principal
Environmental Engineering

15 years in the industry

Mr. Hayes has experience in New York, New Jersey, Washington D.C., California, Washington, Oregon, Alaska, and Internationally. His experience includes Environmental Protection Agency (EPA), New York State (NYS) Brownfield's application, investigation, and remediation; New York City Department of Environmental Protection (NYCDEP) and New York City Office of Environmental Remediation (OER) E-designated site application, investigation, and remediation. His expertise also includes Phase I and II Environmental Site Investigations and Assessments; contaminated building cleanup and demolition; Underground Storage Tank (UST) permitting, removal specifications, and closure reporting; soil vapor intrusion investigation and mitigation system design (depressurization systems, etc.); development of groundwater contaminant plume migration models; environmental analysis; and oversight, design and specification generation for remediation operations with contaminants of concern to include polychlorinated biphenyls (PCBs), solvents, mercury, arsenic, petroleum products, asbestos, mold and lead.

Selected Projects

Confidential Location (Remediation for Mercury-Contaminated Site), New York, NY
Confidential Location (Phase II ESI and Remedial Design for Mercury Impacted Site), Brooklyn, NY
NYC School Construction Authority (PCB Remediation), Various Locations, New York, NY
28-29 High Line (Phase I ESA, Phase II ESI, and Environmental Remediation), New York, NY
Georgetown Heating Plant (Phase II ESI and Remedial Design for Mercury Impacted Site), Washington D.C.
268 West Street (BCP Application, RI and RIWP), New York, NY
Confidential Multiple Mixed-Use Tower Location (BCP Application, RI, Phase I ESA, and Phase II ESI), New York, NY
Brooklyn Navy Yard Dry-Dock (NYS Voluntary Cleanup Program), Brooklyn, NY
27-21 44th Drive (BCP Application, Remedial Investigation Phase I ESA, and Phase II ESI), Long Island City, NY
4430 Purves Street (BCP Application, RAWP, and Phase II ESI), Long Island City, NY
267-273 West 87th Street (BCP Application, Remedial Investigation, RIWP, RAWP), New York, NY
New York Aquarium, Shark Tank and Animal Care Facility (Environmental Remediation), Coney Island, NY
International Leadership Charter School (Environmental Remediation), Bronx, NY
West & Watts (BCP Application), New York, NY

Education

M.S., Environmental Engineering
Columbia University

B.S., Chemistry, Environmental Toxicology
Humboldt State University

Business Administration (minor)
Humboldt State University

Professional Registration

Professional Engineer (PE) in NY

LEED Accredited Professional (LEED AP)

Troxler Certification for Nuclear Densometer Training

CPR and First Aid Certification

OSHA 40-Hour (HAZWOPER)

OSHA HAZWOPER Site Supervisor

Affiliations

US Green Building Council, NYC Chapter (USGBC), Communications Committee

Urban Land Institute (ULI), member

Commercial Real Estate Development Association (NAIOP), member

NYC Brownfield Partnership, member

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Hudson Yards Redevelopment (Phase I ESA and Phase II ESI), New York, NY
627 Smith Street (RI and Report), Brooklyn, NY
Gateway Center II Retail (Phase I ESA and Phase II ESI), Brooklyn, NY
261 Hudson Street (Phase I ESA, Phase II ESI, BCP, and RAWP), New York, NY
Riverside Center, Building Two (BCP, Phase I ESA and Phase II ESI), New York, NY
New York Police Academy, (Sub-Slab Depressurization and Vapor Barrier System), College Point, NY
Bronx Terminal Market (BCP, RIWP, RAWP, Phase I ESA and Phase II ESI), Bronx, NY
Jacob Javits Convention Center (Phase I ESA and Phase II ESI), New York, NY
Yankee Stadium Development Waterfront Park (NYSDEC Spill Sites), Bronx, NY
Bushwick Inlet Park (Phase I ESA, Approvals for NYC E-Designation), Brooklyn, NY
Silvercup West Residential (BCP, RIWP, RIR, RAWP, and RAA), Long Island City, NY
29 Flatbush Residential Tower (Groundwater Studies, RIR and RAWP), Brooklyn, NY
Gowanus Village I (BCP, RIWP and RIR), Brooklyn, NY
Sullivan Street Hotel (Site Characterization Study and Owner Representation), New York, NY
Riker’s Island Co-Generation Plant (Soil and Soil Vapor Quality Investigations), Bronx, NY
The Shops at Atlas Park (Sub-Slab Depressurization and Vapor Barrier Design), Glendale, NY
Memorial Sloan-Kettering Cancer Center (Subsurface and Soil Vapor Intrusion Investigations), New York, NY
Element West 59th Street (Oversight and Monitoring of Sub-Slab Depressurization and Vapor Barrier Systems), New York, NY
Teterboro Airport (Delineation and Remedial Oversight of Petroleum-Contaminated Soils), Teterboro, NJ
Proposed New York JETS Stadium (Phase I ESA), New York, NY
Former Con Edison Manufactured Gas Plant Sites (Research Reports), New York, NY
7 World Trade Center (Endpoint Sampling and Final Closure Report), New York, NY
Peter Cooper Village, Environmental Subsurface Investigations, New York, NY

Selected Publications, Reports, and Presentations

NYC Mayor’s Office of Environmental Remediation – Big Apple Brownfield Workshop – Presented on Soil Vapor Intrusion Remedies (e.g., SSD Systems, Vapor Barriers, Modified HVAC)

New York City Brownfield Partnership – Presented on environmental considerations and complications of the Hudson yards Development

Waterfront Development Technical Course – Presented on Impacted Waterfront Planning Considerations

Anthony Moffa, Jr., ASP, CHMM, COSS

Associate/Corporate Health and Safety Manager

Anthony is Langan's Corporate Health & Safety Manager and is responsible for managing health and safety compliance in all Langan office locations. He has over 15 years experience in the health and safety field. He is responsible for ensuring compliance with all federal and state occupational health and safety laws and development and implementation of corporate health and safety policies. Responsibilities include reviewing and updating Langan's Corporate Health and Safety Program and assisting employees in the development of site specific Health & Safety Plans. He maintains and manages health and safety records for employees in all Langan office locations including medical evaluations, respirator fit testing, and Hazardous Waste Operations and Emergency Response training. He is also responsible for documentation and investigation of work-related injuries and incidents and sharing this information with employees to assist in the prevention of future incidents. He is also the chairman of the Corporate Health & Safety Committee and Health & Safety Leadership Team that meet periodically throughout the year. He is responsible for coordinating and providing health and safe training to Langan employees. He was formerly the Environmental, Health and Safety Coordinator at a chemical manufacturer. His experience included employee hazard communications, development of material safety data sheets for developed products, respirator fit testing and conducting required Occupational Health & Safety Association and Department of Transportation training.

Education

B.S., Physics
West Chester University

Professional Registration

Associate Safety Professional (ASP)

Certified Hazardous Material Manager (CHMM)

Certified Occupational Safety Specialist (COSS)

Affiliations

Pennsylvania Chamber of Business & Industry

Chemical Council of New Jersey

New Jersey Business & Industry Association

Geoprofessional Business Association

Certifications and Training

Hazardous Waste Operations and Emergency Response Training

OSHA Site Supervisor Training

10 & 30-Hour Construction Safety & Health Training

30-Hour Construction Safety & Health Training

10-Hour Industry Safety & Health Training

Confined Space Awareness & Entry

Competent Person in Excavations

Hazard Communications

Defensive Driving Training

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Mimi Raygorodetsky

Senior Associate
Environmental Engineering

16 years in the industry

Ms. Raygorodetsky sources and directs large, complex environmental remediation and redevelopment projects from the earliest stages of pre-development diligence, through the remediation/construction phase, to long-term operation and monitoring of remedial systems and engineering controls. She has a comprehensive understanding of federal, state and local regulatory programs and she uses this expertise to guide her clients through a preliminary cost benefit analysis to select the right program(s) given the clients' legal obligations, development desires and risk tolerance. She is particularly strong at integrating the requirements of selected programs and client development needs to develop and design targeted and streamlined diligence programs and remediation strategies. Ms. Raygorodetsky is also highly skilled in integrating remediation with construction on large urban waterfront projects, which tend to more complex than landside projects.

Selected Projects

- 25 Kent Avenue, Due Diligence for Purchase of a Brownfields Location, Brooklyn, NY
- Ferry Point Waterfront Park, Redevelopment of a Former Landfill into a Park, Bronx, NY
- Battery Maritime Building (10 South Street), Phase I ESA, New York, NY
- Residential Development at 351-357 Broadway, Phase 1 ESA, New York, NY
- 450 Union Street, Phase I and Phase II Remediation (NYS DEC Brownfield Cleanup Program), New York, NY
- Echo Bay Center, NYS DEC Brownfield Cleanup Program, New York, NY
- 420 Kent Avenue, NYS DEC Brownfield Cleanup Program, Brooklyn, NY
- 416 Kent Avenue, NYS DEC Brownfield Cleanup Program, Brooklyn, NY
- 264 Fifth Avenue, Phase I ESA, New York, NY
- 262 Fifth Avenue, Phase I ESA, New York, NY
- ABC Blocks 25-27 (Mixed-Use Properties), Brownfield Cleanup Program, Long Island City, NY
- Residences at 100 Barrow Street, Phase I ESA, New York, NY
- Residences at 22-12 Jackson Avenue, Due Diligence for Building Sale, Long Island City, NY
- Residences at 2253-2255 Broadway, Phase I and Phase II Services, New York, NY
- Prince Point, Phase I ESA, Staten Island, NY
- 787 Eleventh Avenue (Office Building Renovation), Phase I UST Closure, New York, NY
- 218 Front Street/98 Gold Street, Planning and Brownfield Consulting, Brooklyn, NY

Education

B.A., Biology and Spanish Literature
Colby College

Affiliations

Committee Member – New York Building Congress, Council of Industry Women

Founding Member and Current President – New York City Brownfield Partnership

Committee Member – NYC Office of Environmental Remediation Technical Task Force

- Mark JCH of Bensonhurst, Phase I and HazMat Renovation, Brooklyn, NY
- 39 West 23rd Street, E-Designation Brownfield, New York, NY
- 250 Water Street, Phase I and Phase II Property Transaction, New York, NY
- 27-19 44th Drive, Residential Redevelopment, Long Island City, NY
- 515 West 42nd Street, E-Designation, New York, NY
- 310 Meserole Street, Due Diligence Property Purchase, Brooklyn, NY
- Former Georgetown Heating Plant, HazMat and Phase I ESA, Washington D.C.
- 80-110 Flatbush Avenue, Brooklyn, NY
- 132 East 23rd Street, New York, NY
- 846 Sixth Avenue, New York, NY
- Greenpoint Landing, Remediation/Redevelopment, Brooklyn, NY
- 711 Eleventh Avenue, Due Diligence/Owner's Representative, New York, NY
- Brooklyn Bridge Park, Pier 1, Waste Characterization and Remediation, Brooklyn, NY
- Post-Hurricane Sandy Mold Remediation, Various Private Homes, Far Rockaway, NY
- Brooklyn Bridge Park, One John Street Development, Pre-Construction Due Diligence and Construction Administration, Brooklyn, NY
- 7 West 21st Street, Brownfields Remediation, New York, NY
- 546 West 44th Street, Brownfields Remediation, New York, NY
- Post-Hurricane Sandy Mold Remediation, Various Private Homes, Nassau and Suffolk Counties, Long Island, NY
- 55 West 17th Street, Brownfield Site Support, New York, NY
- Pratt Institute, 550 Myrtle Avenue Renovations, Environmental Remediation, Brooklyn, NY
- 42-02 Crescent Street Redevelopment, Phase I and II Environmental, Long Island City, NY
- IAC Building (555 West 18th Street), New York, NY
- Retirement Communities on100-acre Parcels in ME, NJ, MA, CT, and NJ
- 363-365 Bond Street/400 Carroll Street, Brooklyn, NY
- 160 East 22nd Street, New York, NY
- 110 Third Avenue, New York, NY
- Lycee Francais (East 76th Street & York Avenue), New York, NY
- Winchester Arms Munitions Factory, New Haven, CT

Gregory C. Wyka, LEED AP

Project Geologist
Environmental Engineering

8 years in the industry

Mr. Wyka is a geologist with experience in regulatory government, brownfield development, and environmental liability consulting. His expertise includes site characterization, remedial investigation, waste characterization, conceptual site modeling, remedial design and implementation, construction management, GIS, and sustainability. Mr. Wyka's abilities integrate remediation with property redevelopment and he provides technical, regulatory, logistical, and risk management guidance to clients, including developers, owners, and environmental attorneys. He provides direct assistance for clients on construction and remediation projects in the New York State Inactive Hazardous Waste Disposal Site Program, New York State Spill Response Program, New York State Brownfield Cleanup Program, New York City E-Designation Program and New York City Voluntary Cleanup Program.

Selected Projects

Greenpoint Landing Waterfront Residential Development, Phase I ESAs, remedial investigations, waste characterizations, remedial action work plans, remedial action implementation, construction management, e-designation management and closure, and agency coordination, Brooklyn, NY

Brownfield Cleanup Program, remedial Investigations and agency coordination, ABC site, Long Island City, NY

Brownfield Cleanup Program, remedial investigations and agency coordination, City DPW Yard, New Rochelle, NY

160 Leroy Street, Phase I ESA, remedial investigations, waste characterizations, remedial action work plans, remedial action implementation, construction management, e-designation management, and agency/client coordination, New York, NY

2409 Jerome Avenue, phase I ESA, phase II ESI, remedial investigation, open spill management, and agency/client coordination, Bronx, NY

685 First Avenue, New York, NY – Waste characterization, construction management, and agency coordination, Bronx, NY

60 West Street, remedial investigation, waste characterization, remedial action work plan, and e-designation management, Brooklyn, NY

27-19 44th Drive, construction management and agency coordination, Long Island City, NY

82 King Street, e-designation management, New York, NY

515 West 42nd Street, e-designation management, New York, NY

421 Kent Avenue, remedial investigations, waste characterizations, remedial action work plans, remedial action implementation, construction management, e-designation management, and agency/client coordination, Brooklyn, NY

Education

B.A., Geology, Chemistry and Environmental Studies
Bowdoin College

Professional Registrations

LEED AP Neighborhood Development

40 Hour OSHA HAZWOPER
10 Hour OSHA Construction Safety
8 Hour OSHA Site Supervisor

CPR and First Aid Certified

Affiliations

New York State Council of Professional Geologists (NYSCPG)

Urban Green Council

New York City Brownfield Partnership

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Brooklyn Bridge Park, Pierhouse, construction management and agency/client coordination, Brooklyn, NY
550 Myrtle Avenue, construction management, e-designation management and closure, Brooklyn, NY
310 Meserole Street, Phase I ESA, Brooklyn, NY
13-17 Laight Street, Phase I ESA, New York, NY
460 Mother Gaston Boulevard, Phase I ESA, Brooklyn, NY
25 Kent Avenue, Phase I ESA, Brooklyn, NY
1110 Oak Point Avenue, Phase I ESA, Bronx, NY
859-863 Lexington Avenue, Phase I ESA, New York, NY
49 East 21st Street, Phase I ESA, New York, NY
1552-1560 Broadway, Phase I ESA, New York, NY
287-291 East Houston Street, Phase I ESA, New York, NY
205 Water Street, construction oversight and management, tank closure, e-designation management and closure, Brooklyn, NY
29-01 Borden Avenue, remedial investigation and petroleum spill closure, Long Island City, NY
29-10 Hunters Point Avenue, remedial investigation and tank closure, Long Island City, NY
30-27 Greenpoint Avenue, remedial investigation and petroleum spill closure, Long Island City, NY –
55 Water Street, emergency petroleum spill closure (Tropical Storm Sandy), New York, NY
489 Great Neck Road, remedial investigation and remedial design, Great Neck, NY
505 West 27th Street, remedial investigation and e-designation management, New York, NY
144 East 201st Street, Phase I ESA, remedial investigation, construction oversight, and e-designation management, Bronx, NY
Big River Study Area (Superfund), remedial investigation, Old Lead Belt, Park Hills and Desloge, MO
Berry’s Creek Study Area (Superfund Site), remedial investigation, Bergen County, NJ
Everglades Restoration Project, remedial investigation, Clewiston, FL
Marble River Wind Farm, wetland delineation, Ellenburg, NY

ATTACHMENT D

Sample Nomenclature

SOP #01 – Sample Nomenclature

INTRODUCTION

The Langan Environmental Group conducts an assortment of site investigations where samples (Vapor, Solids, and Aqueous) are collected and submitted to analytical laboratories for analysis. The results of which are then evaluated and entered into a data base allowing quick submittal to the state regulatory authority (New York State Division of Environmental Conservation [NYSDEC]). In addition, Langan is linking their data management system to graphic and analytical software to enable efficient evaluation of the data as well as creating client-ready presentational material.

SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) is applicable to the general framework for labeling vapor, solid (soil) and aqueous (groundwater) samples that will be submitted for laboratory analysis. The nomenclature being introduced is designed to meet the NYSDEC EQuIS standard and has been incorporated into Langan software scripts to assist project personnel in processing the data. While this SOP is applicable to all site investigation; unanticipated conditions may arise which may require considerable flexibility in complying with this SOP. Therefore, guidance provided in this SOP is presented in terms of general steps and strategies that should be applied; but deviation from this SOP must be reported to the Project Manager (PM) immediately.

GENERAL SAMPLE IDENTIFICATION CONSIDERATIONS

Sample Labels

All sample ware must have a label. Recall that when you are using the Encore™ samples (see below); they are delivered in plastic lined foil bags. You are to label the bags[1]:

All other samples containers including Terra Cores™ must be labeled with laboratory provided self-adhesive labels.

Quick Breakdown of Sample Format

The general format for sample nomenclature is:

[1]Both Alpha and York laboratories permit the combining of the three Encore™ into a single bag. This may not be appropriate for all laboratories so please confirm with the labs themselves

LLNN_ID

Where

LL is a grouping of two (2) to four (4) letters signifying the sample media source. In older nomenclature SOPs this portion of the sample identification is commonly referred to as the *Sample Investigation Code*

NN represents a two digit number identifying the specific sample location or sample sequence number

_ ***(underscore)*** is required between the sample lettering and numeric identification and additional modifying data that determines the date of sampling or the depth of the sample interval

ID is a modifier specific to the sample type media (depth of soil sample or date of groundwater sample)

LL – Sample Investigation Code

Langan has devised a list of two to four letters to insure a quick ability to identify the sample investigation.

Code	**Investigation**
AA	Ambient Air
DS	Drum
EPB	Endpoint Location - Bottom (Excavation)
EPSW	Endpoint Location - Sidewall (Excavation)
FP	Free Product
IA	Indoor Air
IDW	Investigation Derived Waste (Soil Pile)
MW	Monitoring Well (Permanent)
SB	Soil Boring
SG	Staff Gauge (Stream Gauging)
SL	Sludge
SV	Soil Vapor Point
SVE	Soil Vapor Extraction Well
SW	Surface Water
TMW	Temporary Monitoring Well
TP	Test Pit (Excavated Material from Test Pit Not Associated With Sidewall or Bottom Samples)
WC	Waste Characterization Boring
COMP	Composite Sample
TB	Trip Blank (QA/QC Sampling – All Investigations)
FB	Field Blank (QA/QC Sampling – All Investigations)
DUP	Duplicate (QA/QC Sampling – All Investigations)

NN – Numeric Identifier

The two digit number that follows the sample investigation code (LL) identifies the specific sample based on the soil boring, monitoring well, endpoint or other location identification. For a subset of samples where there is no specific location identifier, the two digit number is the sequence number for the sample submitted. For example, an aqueous sample from a monitoring well identified as MW-1 would have the sample investigation code of MW and the numeric identifier as 01. Note there is no hyphen. The same can be done for soil borings, a soil sample collected from soil boring 9 (SB-9) would be have the LLNN identification of SB09 (again, no hyphen).

Note however that there is a subset of samples related to laboratory analytical quality assurance, among these includes TB, FB, and DUP. On many investigations, the Scope will require multiple collections of these types of samples, therefore the numerical number represents the sequence sample count where the first sample is 01, the second sample is 02, and the third sample is 03 and so on.

_ Underscore

The underscore is required. It separates the investigation code and numeric identifier from the modifier specific to the sample itself. Note that every effort should be made to insure that the underscore is clear on the sample label and chain of custody (COC).

ID – Modifier Specific to Type Media

Each sample investigation code and numeric identifier is further modified by an ID specific to the sample type media. In general, soil samples (soil borings or endpoint samples) use an ID that indicates the depth at which the sample was taken. Aqueous samples (groundwater or surface water samples) are identified by the date the sample was collected. Other types of samples including quality control (TB, FB, and DUP), Vapor samples (AA, IA, SV or SVE), other soil type samples (IDW, sludge, free product, drum, and others) are also identified by a date. The following rules apply to the ID when using sample depth or sample date.

Sample Depth

The sample depth must be whole numbers (no fractions) separated by a hyphen. Thus for a soil sample collected from the soil boring SB-1 from a depth of 6 feet to 8 feet, the sample would be identified as:

SB01_6-8

Unfortunately, the NYSDEC EQuIS system does not accept fractions. Therefore, if your sample interval is a fraction of a foot (6.5-7.5), round up to the larger interval (6-8).

Sample Date

The sample date is always in the format of MMDDYY. Note that the year is two digits. Thus for a groundwater sample collected on July 1, 2015 from the monitoring well MW-1, the sample would be identified as:

MW01_070115

Special Cases

There are a couple of specific sample types that require further explanation.

Endpoint Sampling

End point sidewall samples are sometimes modified by magnetic direction (N, S, E, and W). For example, the first sidewall endpoint sample from the north wall of an excavation at a depth of 5 feet would be written as:

EPSW01_N_5

Again, note that the N in the identification refers to north and is separated from the prefix investigation code/numeric identifier and ID modifier suffix by underscores.

Vapor Extraction Well Sample
As with the sidewall endpoint samples, the sample name is altered by inserting a middle modifier between the prefix and suffix of the sample name. The middle modifier is used to identify the source of the sample (inlet sample port, midpoint sample port or outlet sample port). For example the midpoint port of the vapor extraction well number 1 sampled on July 1, 2015 would be written as;

SVE01_MID_070115

Matrix Spike and Matrix Spike Duplicate
On occasion, a Langan investigation will collect a sample to be used to provide the lab with a site specific medium to spike to determine the quality of the analytical method. This special case of sampling requires additional information to be used in the sample name, specifically, a suffix specifying whether the sample is the matrix spike (MS) or the matrix spike duplicate (MSD). In the following example, the sample is collected from soil boring number 1 at a depth of 2-4 feet. For the matrix spike sample:

SB01_2-4_MS

and for the matrix spike duplicate sample:

SB01_2-4_MSD

Multiple Interval Groundwater Sampling
Although not currently a common practice, low flow sampling facilitates stratigraphic sampling of a monitoring well. If the scope requires stratigraphic sampling then groundwater samples will be labeled with a lower case letter following the well number. For example, placing the pump or sampling tube at 10 feet below surface in MW01 on July 1, 2015 would require the sample to be labeled as:

MW01a_070115

While a second sample where the pump or tubing intake is placed at 20 feet would be labeled as:

MW01b_070115

Note that it is important that you record what depth the intake for each sample represents in your field notes; as this information is going to be critical to interpreting the results.

ATTACHMENT E

Per- And Polyfluoroalkyl Substances (PFAS) Sampling And Analysis Protocols

Determination of Selected Perfluorinated Alkyl Substances by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry Isotope Dilution (LC/MS/MS)

Reference: EPA Method 537, Version 1.1, September 2009, EPA Document #: EPA/600/R-08/09

EPA Method 537.1, Version 1, November 2018, EPA Document #: EPA/600/R-18/352

Department of Defense, Quality Systems Manual for Environmental Laboratories, Version 5.2, .2019

1. Scope and Application

Matrices: Drinking water, Non-potable Water, and Soil Matrices

Definitions: Refer to Alpha Analytical Quality Manual.

1.1 This is a liquid chromatography/tandem mass spectrometry (LC/MS/MS) method for the determination of selected perfluorinated alkyl substances (PFAS) in Non-Drinking Water and soil Matrices. Accuracy and precision data have been generated in reagent water, and finished ground and surface waters for the compounds listed in Table 1.

1.2 The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

1.3 This method is restricted to use by or under the supervision of analysts experienced in the operation of the LC/MS/MS and in the interpretation of LC/MS/MS data. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability.

2. Summary of Method

2.1 A 250-mL water sample is fortified with extracted internal standards (EIS) and passed through a solid phase extraction (WAX) cartridge containing a mixed mode, Weak Anion Exchange, reversed phase, water-wettable polymer to extract the method analytes and isotopically-labeled compounds. The compounds are eluted from the solid phase in two fractions with methanol followed by a small amount of 2% ammonium hydroxide in methanol solution. The extract is concentrated with nitrogen in a heated water bath, and then adjusted to a 1-mL volume with 80:20% (vol/vol) methanol:water. A 3 µl injection is made into an LC equipped with a C18 column that is interfaced to an MS/MS. The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical LC/MS/MS conditions. The concentration of each analyte is determined by using the isotope dilution technique. Extracted Internal Standards (EIS) analytes are used to monitor the extraction efficiency of the method analytes.

2.2 Method Modifications from Reference

None.

Table 1

Parameter	Acronym	CAS
PERFLUOROALKYL ETHER CARBOXYLIC ACIDS (PFECAs)		
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid	HFPO-DA	62037-80-3
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
PERFLUOROALKYLCARBOXILIC ACIDS (PFCAs)		
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA *	307-24-4
Perfluoroheptanoic acid	PFHpA *	375-85-9
Perfluorooctanoic acid	PFOA *	335-67-1
Perfluorononanoic acid	PFNA *	375-95-1
Perfluorodecanoic acid	PFDA *	335-76-2
Perfluoroundecanoic acid	PFUnA *	2058-94-8
Perfluorododecanoic acid	PFDoA *	307-55-1
Perfluorotridecanoic acid	PFTrDA *	72629-94-8
Perfluorotetradecanoic acid	PFTA *	376-06-7
Perfluorohexadecanoic acid	PFHxDA	67905-19-5
Perfluorooctadecanoic acid	PFODA	16517-11-6
PERFLUOROALKYLSULFONATES (PFASs)		
Perfluorobutanesulfonic acid	PFBS *	375-73-5
Perfluoropentanesulfonic acid	PFPeS	2706-91-4
Perfluorohexanesulfonic acid	PFHxS *	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanesulfonic acid	PFOS *	1763-23-1
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5

*** also reportable via the standard 537 method**

Table 1 Cont.

Parameter	Acronym	CAS
CHLORO-PERFLUOROALKYLSULFONATE		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
PERFLUOROOCTANESULFONAMIDES (FOSAs)		
Perfluorooctanesulfonamide	PFOSA	754-91-6
N-methylperfluoro-1-octanesulfonamide	NMeFOSA	31506-32-8
N-ethylperfluoro-1-octanesulfonamide	NEtFOSA	4151-50-2
TELOMER SULFONATES		
1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	4:2FTS	27619-93-8
1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	6:2FTS	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	8:2FTS	39108-34-4
1H,1H,2H,2H-perfluorododecane sulfonate (10:2)	10:2FTS	120226-60-0
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS		
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA *	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA *	2991-50-6
NATIVE PERFLUOROOCTANESULFONAMIDOETHANOLS (FOSEs)		
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	NMeFOSE	24448-09-7
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	NEtFOSE	1691-99-2

*** also reportable via the standard 537 method**

3. Reporting Limits

The reporting limit for PFAS's is 2 ng/L for aqueous samples (20 ng/L for HFPO-DA) and 1 ng/g (10 ng/g for HFPO-DA) for soil samples.

4. Interferences

4.1 PFAS standards, extracts and samples should not come in contact with any glass containers or pipettes as these analytes can potentially adsorb to glass surfaces. PFAS analyte and EIS standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers.

4.2 Method interferences may be caused by contaminants in solvents, reagents (including reagent water), sample bottles and caps, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. The method analytes in this method can also be found in many common laboratory supplies and equipment, such as PTFE (polytetrafluoroethylene) products, LC solvent lines, methanol, aluminum foil, SPE sample transfer lines, etc. All items such as these must be routinely demonstrated to be free from interferences (less than 1/3 the RL for each method analyte) under the conditions of the analysis by analyzing laboratory reagent blanks as described in Section 9.2. **Subtracting blank values from sample results is not permitted.**

4.3 Matrix interferences may be caused by contaminants that are co-extracted from the sample. The extent of matrix interferences will vary considerably from source to source, depending upon the nature of the water. Humic and/or fulvic material can be co-extracted during SPE and high levels can cause enhancement and/or suppression in the electrospray ionization source or low recoveries on the SPE sorbent. Total organic carbon (TOC) is a good indicator of humic content of the sample.

4.4 SPE cartridges can be a source of interferences. The analysis of field and laboratory reagent blanks can provide important information regarding the presence or absence of such interferences. Brands and lots of SPE devices should be tested to ensure that contamination does not preclude analyte identification and quantitation.

5. Health and Safety

5.1 The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

5.2 All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.3 PFOA has been described as “likely to be carcinogenic to humans.” Pure standard materials and stock standard solutions of these method analytes should be handled with suitable protection to skin and eyes, and care should be taken not to breathe the vapors or ingest the materials.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection for Aqueous Samples

6.1.1 Samples must be collected in two (2) 250-mL high density polyethylene (HDPE) container with an unlined plastic screw cap.

6.1.2 The sample handler must wash their hands before sampling and wear nitrile gloves while filling and sealing the sample bottles. PFAS contamination during sampling can occur from a number of common sources, such as food packaging and certain foods and beverages. Proper hand washing and wearing nitrile gloves will aid in minimizing this type of accidental contamination of the samples.

6.1.3 Open the tap and allow the system to flush until the water temperature has stabilized (approximately 3 to 5 min). Collect samples from the flowing system.

6.1.4 Fill sample bottles. Samples do not need to be collected headspace free.

6.1.5 After collecting the sample and cap the bottle. Keep the sample sealed from time of collection until extraction.

6.1.6 Field Reagent Blank (FRB)

6.1.6.1 A FRB must be handled along with each sample set. The sample set is composed of samples collected from the same sample site and at the same time. At the laboratory, fill the field blank sample bottle with reagent water and preservatives, seal, and ship to the sampling site along with the sample bottles. For each FRB shipped, an empty sample bottle (no preservatives) must also be shipped. At the sampling site, the sampler must open the shipped FRB and pour the reagent water into the empty shipped sample bottle, seal and label this bottle as the FRB. The FRB is shipped back to the laboratory along with the samples and analyzed to ensure that PFAS's were not introduced into the sample during sample collection/handling.

The reagent water used for the FRBs must be initially analyzed for method analytes as a MB and must meet the MB criteria in Section 9.2.1 prior to use. This requirement will ensure samples are not being discarded due to contaminated reagent water rather than contamination during sampling.

6.2 Sample Collection for Soil and Sediment samples.

Grab samples are collected in polypropylene containers. Sample containers and contact surfaces containing PTFE shall be avoided.

6.3 Sample Preservation

Not applicable.

6.4 Sample Shipping

Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.

NOTE: Samples that are significantly above 10° C, at the time of collection, may need to be iced or refrigerated for a period of time, in order to chill them prior to shipping. This will allow them to be shipped with sufficient ice to meet the above requirements.

6.5 Sample Handling

6.5.1 Holding Times

6.5.1.1 Water samples should be extracted as soon as possible but must be extracted within 14 days. Soil samples should be extracted within 28 days. Extracts are stored at < 10 ° C and analyzed within 28 days after extraction.

7. Equipment and Supplies

7.1 SAMPLE CONTAINERS – 250-mL high density polyethylene (HDPE) bottles fitted with unlined screw caps. Sample bottles must be discarded after use.

7.2 POLYPROPYLENE BOTTLES – 4-mL narrow-mouth polypropylene bottles.

7.3 CENTRIFUGE TUBES – 50-mL conical polypropylene tubes with polypropylene screw caps for storing standard solutions and for collection of the extracts.

7.4 AUTOSAMPLER VIALS – Polypropylene 0.7-mL autosampler vials with polypropylene caps.

7.4.1 NOTE: Polypropylene vials and caps are necessary to prevent contamination of the sample from PTFE coated septa. However, polypropylene caps do not reseal, so evaporation occurs after injection. Thus, multiple injections from the same vial are not possible.

7.5 POLYPROPYLENE GRADUATED CYLINDERS – Suggested sizes include 25, 50, 100 and 1000-mL cylinders.

7.6 Auto Pipets – Suggested sizes include 5, 10, 25, 50, 100, 250, 500, 1000, 5000 and 10,000-µls.

7.7 PLASTIC PIPETS – Polypropylene or polyethylene disposable pipets.

7.8 ANALYTICAL BALANCE – Capable of weighing to the nearest 0.0001 g.

7.9 SOLID PHASE EXTRACTION (SPE) APPARATUS FOR USING CARTRIDGES

7.9.1 SPE CARTRIDGES – 0.5 g SPE cartridges containing a reverse phase copolymer characterized by a weak anion exchanger (WAX) sorbent phase.

7.9.2 VACUUM EXTRACTION MANIFOLD – A manual vacuum manifold with large volume sampler for cartridge extractions, or an automatic/robotic sample preparation system designed for use with SPE cartridges, may be used if all QC requirements discussed in Section 9 are met. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. Care must be taken with automated SPE systems to ensure the PTFE commonly used in these systems does not contribute to unacceptable analyte concentrations in the MB (Sect. 9.2.1).

7.9.3 SAMPLE DELIVERY SYSTEM – Use of a polypropylene transfer tube system, which transfers the sample directly from the sample container to the SPE cartridge, is recommended, but not mandatory. Standard extraction manifolds come equipped with PTFE transfer tube systems. These can be replaced with 1/8" O.D. x 1/16" I.D. polypropylene or polyethylene tubing cut to an appropriate length to ensure no sample contamination from the sample transfer lines. Other types of non-PTFE tubing may be used provided it meets the MB (Sect. 9.2.1) and LCS (Sect. 9.3) QC requirements. The PTFE transfer tubes may be used, but an MB must be run on each PFTE transfer tube and the QC requirements in Section 13.2.2 must be met. In the case of automated SPE, the removal of PTFE lines may not be feasible; therefore, MBs will need to be rotated among the ports and must meet the QC requirements of Sections 13.2.2 and 9.2.1.

7.10 Extract Clean-up Cartridge – 250 mg 6ml SPE Cartridge containing graphitized polymer carbon

7.11 EXTRACT CONCENTRATION SYSTEM – Extracts are concentrated by evaporation with nitrogen using a water bath set no higher than 65 °C.

7.12 LABORATORY OR ASPIRATOR VACUUM SYSTEM – Sufficient capacity to maintain a vacuum of approximately 10 to 15 inches of mercury for extraction cartridges.

7.13 LIQUID CHROMATOGRAPHY (LC)/TANDEM MASS SPECTROMETER (MS/MS) WITH DATA SYSTEM

7.13.1 LC SYSTEM – Instrument capable of reproducibly injecting up to 10-µL aliquots, and performing binary linear gradients at a constant flow rate near the flow rate used for development of this method (0.4 mL/min). The LC must be capable of pumping the water/methanol mobile phase without the use of a degasser which pulls vacuum on the mobile phase bottle (other types of degassers are acceptable). Degassers which pull vacuum on the mobile phase bottle will volatilize the ammonium acetate mobile phase causing the analyte peaks to shift to earlier retention times over the course of the analysis batch. The usage of a column heater is optional.

NOTE: During the course of method development, it was discovered that while idle for more than one day, PFAS's built up in the PTFE solvent transfer lines. To prevent long delays in purging high levels of PFAS's from the LC solvent lines, they were replaced with PEEK tubing and the PTFE solvent frits were replaced with stainless steel frits. It is not possible to remove all PFAS background contamination, but these measures help to minimize their background levels.

7.13.2 LC/TANDEM MASS SPECTROMETER – The LC/MS/MS must be capable of negative ion electrospray ionization (ESI) near the suggested LC flow rate of 0.4 mL/min. The system must be capable of performing MS/MS to produce unique product ions for the method analytes within specified retention time segments. A minimum of 10 scans across the chromatographic peak is required to ensure adequate precision.

7.13.3 DATA SYSTEM – An interfaced data system is required to acquire, store, reduce, and output mass spectral data. The computer software should have the capability of processing stored LC/MS/MS data by recognizing an LC peak within any given retention time window. The software must allow integration of the ion abundance of any specific ion within specified time or scan number limits. The software must be able to calculate relative response factors, construct linear regressions or quadratic calibration curves, and calculate analyte concentrations.

7.13.4 ANALYTICAL COLUMN – An LC BEH C_{18} column (2.1 x 50 mm) packed with 1.7 µm d_p C_{18} solid phase particles was used. Any column that provides adequate resolution, peak shape, capacity, accuracy, and precision (Sect. 9) may be used.

8. Reagents and Standards

8.1 GASES, REAGENTS, AND SOLVENTS – Reagent grade or better chemicals should be used.

8.1.1 REAGENT WATER – Purified water which does not contain any measurable quantities of any method analytes or interfering compounds greater than 1/3 the RL for each method analyte of interest. Prior to daily use, at least 3 L of reagent water should be flushed from the purification system to rinse out any build-up of analytes in the system's tubing.

8.1.2 METHANOL (CH_3OH, CAS#: 67-56-1) – High purity, demonstrated to be free of analytes and interferences.

8.1.3 AMMONIUM ACETATE ($NH_4C_2H_3O_2$, CAS#: 631-61-8) – High purity, demonstrated to be free of analytes and interferences.

8.1.4 ACETIC ACID (H_3CCOOH, CAS#: 64-19-7) - High purity, demonstrated to be free of analytes and interferences.

8.1.5 1M AMMONIUM ACETATE/REAGENT WATER – High purity, demonstrated to be free of analytes and interferences.

8.1.6 2mM AMMONIUM ACETATE/METHANOL:WATER (5:95) – To prepare, mix 2 ml of 1M AMMONIUM ACETATE,1 ml ACETIC ACID and 50 ml METHANOL into l Liter of REAGENT WATER.

8.1.7 Methanol/Water (80:20) – To prepare a 1 Liter bottle, mix 200 ml of REAGENT WATER with 800 ml of METHANOL.

8.1.8 AMMONIUM HYDROXIDE (NH_3, CAS#: 1336-21-6) – High purity, demonstrated to be free of analytes and interferences.

8.1.9 Sodium Acetate ($NaOOCCH_3$, CAS#: 127-09-3) – High purity, demonstrated to be free of analytes and interferences.

8.1.10 25 mM Sodium Acetate Buffer – To prepare 250mls, dissolve .625 grams of sodium acetate into 100 mls of reagent water. Add 4 mls Acetic Acid and adjust the final volume to 250 mls with reagent water.

8.1.11 NITROGEN – Used for the following purposes: Nitrogen aids in aerosol generation of the ESI liquid spray and is used as collision gas in some MS/MS instruments. The nitrogen used should meet or exceed instrument manufacturer's specifications. In addition, Nitrogen is used to concentrate sample extracts (Ultra High Purity or equivalent).

8.1.12 ARGON – Used as collision gas in MS/MS instruments. Argon should meet or exceed instrument manufacturer's specifications. Nitrogen gas may be used as the collision gas provided sufficient sensitivity (product ion formation) is achieved.

8.2 STANDARD SOLUTIONS – When a compound purity is assayed to be 96% or greater, the weight can be used without correction to calculate the concentration of the stock standard. PFAS analyte and IS standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers. Standards for sample fortification generally should be prepared in the smallest volume that can be accurately measured to minimize the addition of excess organic solvent to aqueous samples.

NOTE: Stock standards and diluted stock standards are stored at ≤4 °C.

8.2.1 ISOTOPE DILUTION Extracted Internal Standard (ID EIS) STOCK SOLUTIONS - ID EIS stock standard solutions are stable for at least 6 months when stored at 4 °C. The stock solution is purchased at a concentration of 1000 ng/mL.

8.2.2 ISOTOPE DILUTION Extracted Internal Standard PRIMARY DILUTION STANDARD (ID EIS PDS) – Prepare the ID EIS PDS at a concentration of 500 ng/mL. The ID PDS is prepared in 80:20% (vol/vol) methanol:water. The ID PDS is stable for 6 months when stored at ≤4 °C.

Table 2

Isotope Labeled Standard	Conc. of EIS Stock (ng/mL)	Vol. of EIS Stock (mL)	Final Vol. of EIS PDS (mL)	Final Conc. of EIS PDS (ng/mL)
M4PFBA	1000	1.0	2.0	500
M5PFPeA	1000	1.0	2.0	500
M5PFHxA	1000	1.0	2.0	500
M4PFHpA	1000	1.0	2.0	500
M8PFOA	1000	1.0	2.0	500
M9PFNA	1000	1.0	2.0	500
M6PFDA	1000	1.0	2.0	500
M7PFUdA	1000	1.0	2.0	500
MPFDoA	1000	1.0	2.0	500
M2PFTeDA	1000	1.0	2.0	500
M2PFHxDA	50,000	.02	2.0	500
d3-N-MeFOSA	50,000	.02	2.0	500
d5-N-EtFOSA	50,000	.02	2.0	500
d7-N-MeFOSE	50,000	.02	2.0	500
d9-N-EtFOSE	50,000	.02	2.0	500
M8FOSA	1000	1.0	2.0	500
d3-N-MeFOSAA	1000	1.0	2.0	500
d5-N-EtFOSAA	1000	1.0	2.0	500
M3PFBS	929	1.0	2.0	464.5
M3PFHxS	946	1.0	2.0	473
M8PFOS	957	1.0	2.0	478.5
M2-4:2FTS	935	1.0	2.0	467.5
M2-6:2FTS	949	1.0	2.0	474.5
M2-8:2FTS	958	1.0	2.0	479
M3HFPO-DA	50,000	.4	2.0	10,000

8.2.3 ANALYTE STOCK STANDARD SOLUTION – Analyte stock standards are stable for at least 6 months when stored at 4 °C. When using these stock standards to prepare a PDS, care must be taken to ensure that these standards are at room temperature and adequately vortexed.

8.2.4 Analyte Secondary Spiking Standard Prepare the spiking solution of additional add on components for project specific requirements only. ANALYTE PRIMARY SPIKING STANDARD – Prepare the spiking standard at a concentration of 500 ng/mL in methanol. The spiking standard is stable for at least two months when stored in polypropylene centrifuge tubes at room temperature.

Table 3

Analyte	Conc. of IS Stock (ng/mL)	Vol. of IS Stock (mL)	Final Vol. of IS PDS (mL)	Final Conc. of IS PDS (ng/mL)
PFBA	2000	1	4	500
PFPeA	2000	1	4	500
PFHxA	2000	1	4	500
PFHpA	2000	1	4	500
PFOA	2000	1	4	500
PFNA	2000	1	4	500
PFDA	2000	1	4	500
PFUdA	2000	1	4	500
PFDoA	2000	1	4	500
PFTrDA	2000	1	4	500
PFTeDA	2000	1	4	500
FOSA	2000	1	4	500
N-MeFOSAA	2000	1	4	500
N-EtFOSAA	2000	1	4	500
L-PFBS	1770	1	4	442.5
L-PFPeS	1880	1	4	470
L-PFHxSK	1480	1	4	370
Br-PFHxSK	344	1	4	86
L-PFHpS	1900	1	4	475
L-PFOSK	1460	1	4	365
Br-PFOSK	391	1	4	97.75
L-PFNS	1920	1	4	480
L-PFDS	1930	1	4	482.5
4:2FTS	1870	1	4	467.5
6:2FTS	1900	1	4	475
8:2FTS	1920	1	4	480

8.2.5 Analyte Secondary Spiking Standard Prepare the spiking solution of additional add on components for project specific requirements only.

Table 4

Analyte	Conc. of IS Stock (ng/mL)	Vol. of IS Stock (mL)	Final Vol. of IS PDS (mL)	Final Conc. of IS PDS (ng/mL)
ADONA	2000	1	4	500
PFHxDA	2000	1	4	500
PFODA	2000	1	4	500
HFPO-DA	100,000	.4	4	10,000
9ClPF3ONS	50,000	0.04	4	500
11ClPF3OUdS	50,000	0.04	4	500

8.2.6 LOW, MEDIUM AND HIGH LEVEL LCS – The LCS's will be prepared at the following concentrations and rotated per batch; 2 ng/L, 40 ng/L, 500 ng/l for drinking waters. The analyte PDS contains all the method analytes of interest at various concentrations in methanol. The analyte PDS has been shown to be stable for six months when stored at ≤4 °C.

8.2.7 Isotope Dilution Labeled Recovery Stock Solutions (ID REC) – ID REC Stock solutions are stable for at least 6 months when stored at 4 °C. The stock solution is purchased at a concentration of 1000 ng/mL.

8.2.8 Isotope Dilution Labeled Recovery Primary Dilution Standard (ID REC PDS) - Prepare the ID REC PDS at a concentration of 500 ng/mL. The ID REC PDS is prepared in 80:20% (vol/vol) methanol:water. The ID REC PDS is stable for at least six months when stored in polypropylene centrifuge tubes at ≤4 °C.

Table 5

Analyte	Conc. of REC Stock (ng/mL)	Vol. of REC Stock (mL)	Final Vol. of REC PDS (mL)	Final Conc. of REC PDS (ng/mL)
M2PFOA	2000	1	4	500
M2PFDA	2000	1	4	500
M3PFBA	2000	1	4	500
M4PFOS	2000	1	4	500

8.2.9 CALIBRATION STANDARDS (CAL) –

Current Concentrations (ng/mL): 0.5, 1.0, 5.0, 10.0, 50.0, 125, 150, 250, 500

Prepare the CAL standards over the concentration range of interest from dilutions of the analyte PDS in methanol containing 20% reagent water. 20 µl of the EIS PDS and REC PDS are added to the CAL standards to give a constant concentration of 10 ng/ml. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity. The CAL standards may also be used as CCVs (Sect. 9.8). To make calibration stock standards:

Table 6

Calibration Standard Concentration	Final Aqueous Cal STD Level Concentration	Final Soil Cal STD Level Concentration	24 compound stock added (ul)	PFHxDA Stock added (ul)	500 ng/ml PFHxDA dilution added (ul)	PFODA Stock added (ul)	500 ng/ml PFODA dilution added (ul)	ADONA, HFPO-DA, 11Cl-PF3OUdS, 9Cl-PF3ONS Stock added (ul)	500 ng/ml ADONA dilution added (ul)	Final Volume in MeOH/H_2O (82:20)
.5 ng/ml	2 ng/L	.25 ng/g	6.25		25		25		25	25 mls
1 ng/ml	4 ng/L	.5 ng/g	5		20		20		20	10 mls
5 ng/ml	20 ng/L	1 ng/g	25		100		100		100	10 mls
10 ng/ml	40 ng/L	5 ng/g	125	5		5		5		25 mls

50 ng/ml	200 ng/L	25 ng/g	250	10		10		10		10 mls
125 ng/ml	500 ng/L	62.5 ng/g	625	25		25		25		10 mls
150 ng/ml	600 ng/L	75 ng/g	750	30		30		30		10 mls
250 ng/ml	1000 ng/L	125 ng/g	625							5 mls
500 ng/ml	2000 ng/L	250 ng/g	1250							5 mls

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 MINIMUM REPORTING LIMIT (MRL) CONFIRMATION

9.1.1 Fortify, extract, and analyze seven replicate LCSs at 2 ng/l. Calculate the mean measured concentration (*Mean*) and standard deviation for these replicates. Determine the Half Range for the prediction interval of results (HR_{PIR}) using the equation below

$$HR_{PIR} = 3.963s$$

Where:

s = the standard deviation
3.963 = a constant value for seven replicates.

9.1.2 Confirm that the upper and lower limits for the Prediction Interval of Result ($PIR = Mean \pm HR_{PIR}$) meet the upper and lower recovery limits as shown below

The Upper PIR Limit must be ≤150% recovery.

$$\frac{Mean + HR_{PIR}}{Fortified\ Concentration} \times 100\% \leq 150\%$$

The Lower PIR Limit must be ≥ 50% recovery.

$$\frac{Mean - HR_{PIR}}{Fortified\ Concentration} \times 100\% \geq 50\%$$

9.1.3 The RL is validated if both the Upper and Lower PIR Limits meet the criteria described above. If these criteria are not met, the RL has been set too low and must be determined again at a higher concentration.

9.2 Blank(s)

9.2.1 **METHOD BLANK (MB)** - A Method Blank (MB) is required with each extraction batch to confirm that potential background contaminants are not interfering with the identification or quantitation of method analytes. Prep and analyze a MB for every 20 samples. If the MB produces a peak within the retention time window of any analyte that would prevent the determination of that analyte, determine the source of contamination and eliminate the interference before processing samples. Background contamination must be reduced to an acceptable level before proceeding. Background from method analytes or other contaminants that interfere with the measurement of method analytes must be below the RL. If the method analytes are detected in the MB at concentrations equal to or greater than this level, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch. Because background contamination is a significant problem for several method analytes, it is highly recommended that the analyst maintain a historical record of MB data.

9.2.2 **FIELD REAGENT BLANK (FRB)** - The purpose of the FRB is to ensure that PFAS's measured in the Field Samples were not inadvertently introduced into the sample during sample collection/handling. Analysis of the FRB is required only if a Field Sample contains a method analyte or analytes at or above the RL. The FRB is processed, extracted and analyzed in exactly the same manner as a Field Sample.

9.3 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicates (LCSD)

9.3.1 An LCS is required with each extraction batch. The fortified concentration of the LCS may be rotated between low, medium, and high concentrations from batch to batch. Default limits of 50-150% of the true value may be used for analytes until sufficient replicates have been analyzed to generate proper control limits. Calculate the percent recovery (%*R*) for each analyte using the equation

$$\%R = \frac{A \times 100}{B}$$

Where:

A = measured concentration in the fortified sample
B =fortification concentration.

9.3.2 Where applicable, LCSD's are to be extracted and analyzed. The concentration and analyte recovery criteria for the LCSD must be the same as the batch LCS The RSD's must fall within ≤30% of the true value for medium and high level replicates, and ≤50% for low level replicates. Calculate the relative percent difference (RPD) for duplicate MSs (MS and MSD) using the equation

$$RPD = \frac{|LCS - LCSD|}{(LCS + LCSD) / 2} \times 100$$

9.3.3 **If the LCS and or LCSD results do not meet these criteria for method analytes, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch.**

9.4 Labeled Recovery Standards (REC)

The analyst must monitor the peak areas of the REC(s) in all injections during each analysis day.

9.5 Extracted Internal Standards (EIS)

9.5.1 The EIS standard is fortified into all samples, CCVs, MBs, LCSs, MSs, MSDs, FD, and FRB prior to extraction. It is also added to the CAL standards. The EIS is a means of assessing method performance from extraction to final chromatographic measurement. Calculate the recovery (%R) for the EIS using the following equation

$$\%R = (A / B) \times 100$$

Where:

A = calculated EIS concentration for the QC or Field Sample
B = fortified concentration of the EIS.

9.5.2 Default limits of 50-150% may be used for analytes until sufficient replicates have been analyzed to generate proper control limits. A low or high percent recovery for a sample, blank, or CCV does not require discarding the analytical data but it may indicate a potential problem with future analytical data. When EIS recovery from a sample, blank, or CCV are outside control limits, check 1) calculations to locate possible errors, 2) standard solutions for degradation, 3) contamination, and 4) instrument performance. For CCVs and QC elements spiked with all target analytes, if the recovery of the corresponding target analytes meet the acceptance criteria for the EIS in question, the data can be used but all potential biases in the recovery of the EIS must be documented in the sample report. If the associated target analytes do not meet the acceptance criteria,the data must be reanalyzed.

9.6 Matrix Spike (MS)

9.6.1 Analysis of an MS is required in each extraction batch and is used to determine that the sample matrix does not adversely affect method accuracy. Assessment of method precision is accomplished by analysis of a Field Duplicate (FD) (Sect. 9.6); however, infrequent occurrence of method analytes would hinder this assessment. If the occurrence of method analytes in the samples is infrequent, or if historical trends are unavailable, a second MS, or MSD, must be prepared, extracted, and analyzed from a duplicate of the Field Sample. Extraction batches that contain MSDs will not require the extraction of a field sample duplicate. If a variety of different sample matrices are analyzed regularly, for example, drinking water from groundwater and surface water sources, method performance should be established for each. Over time, MS data should be documented by the laboratory for all routine sample sources.

9.6.2 Within each extraction batch, a minimum of one Field Sample is fortified as an MS for every 20 Field Samples analyzed. The MS is prepared by spiking a sample with an appropriate amount of the Analyte Stock Standard (Sect. 8.2.3). Use historical data and rotate through the low, mid and high concentrations when selecting a fortifying concentration. Calculate the percent recovery (%*R*) for each analyte using the equation

$$\%R = \frac{(A - B)}{C} \times 100$$

Where:

A = measured concentration in the fortified sample
B = measured concentration in the unfortified sample
C = fortification concentration.

9.6.3 Analyte recoveries may exhibit matrix bias. For samples fortified at or above their native concentration, recoveries should range between 50-150%. If the accuracy of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the LCS, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7 Laboratory Duplicate

9.7.1 FIELD DUPLICATE OR LABORATORY FORTIFIED SAMPLE MATRIX DUPLICATE (FD or MSD) – Within each extraction batch (not to exceed 20 Field Samples), a minimum of one FD or MSD must be analyzed. Duplicates check the precision associated with sample collection, preservation, storage, and laboratory procedures. If method analytes are not routinely observed in Field Samples, an MSD should be analyzed rather than an FD.

9.7.2 Calculate the relative percent difference (*RPD*) for duplicate measurements (*FD1* and *FD2*) using the equation

$$RPD = \frac{|FD1 - FD2|}{(FD1 + FD2) / 2} \times 100$$

9.7.3 RPDs for FDs should be ≤30%. Greater variability may be observed when FDs have analyte concentrations that are within a factor of 2 of the RL. At these concentrations, FDs should have RPDs that are ≤50%. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the CCV, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7.4 If an MSD is analyzed instead of a FD, calculate the relative percent difference (RPD) for duplicate MSs (MS and MSD) using the equation

$$RPD = \frac{|MS - MSD|}{(MS + MSD) / 2} \times 100$$

9.7.5 RPDs for duplicate MSs should be ≤30% for samples fortified at or above their native concentration. Greater variability may be observed when MSs are fortified at analyte concentrations that are within a factor of 2 of the RL. MSs fortified at these concentrations should have RPDs that are ≤50% for samples fortified at or above their native concentration. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the LCSD where applicable, the result is judged to be matrix biased. If no LCSD is present, the associated MS and MSD are to be re-analyzed to determine if any analytical has occurred. If the resulting RPDs are still outside control limits, the result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.8 Initial Calibration Verification (ICV)

9.8.1 As part of the IDC (Sect. 13.2), and after each ICAL, analyze a QCS sample from a source different from the source of the CAL standards. If a second vendor is not available, then a different lot of the standard should be used. The QCS should be prepared and analyzed just like a CCV. Acceptance criteria for the QCS are identical to the CCVs; the calculated amount for each analyte must be ±

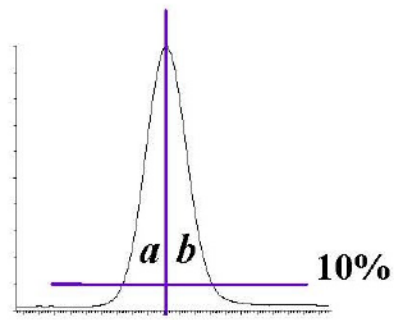
30% of the expected value. If measured analyte concentrations are not of acceptable accuracy, check the entire analytical procedureto locate and correct the problem.

9.9 Continuing Calibration Verification (CCV)

9.9.1 CCV Standards are analyzed at the beginning of each analysis batch, after every 10 Field Samples, and at the end of the analysis batch. See Section 10.7 for concentration requirements and acceptance criteria.

9.10 Method-specific Quality Control Samples

9.10.1 PEAK ASYMMETRY FACTOR – A peak asymmetry factor must be calculated using the equation below during the IDL and every time a calibration curve is generated. The peak asymmetry factor for the first two eluting peaks in a midlevel CAL standard (if only two analytes are being analyzed, both must be evaluated) must fall in the range of 0.8 to 1.5. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.



$$A_s = b / a$$

Where:

A_s = peak asymmetry factor
b = width of the back half of the peak measured (at 10% peak height) from the trailing edge of the peak to a line dropped perpendicularly from the peak apex
a = the width of the front half of the peak measured (at 10% peak height) from the leading edge of the peak to a line dropped perpendicularly from the apex.

9.11 Method Sequence

- CCV-LOW
- MB
- LCS
- LCSD
- MS
- Duplicate or MSD
- Field Samples (1-10)
- CCV-MID
- Field Samples (11-20)
- CCV-LOW

10. Procedure

10.1 Equipment Set-up

10.1.1 This procedure may be performed manually or in an automated mode using a robotic or automatic sample preparation device. If an automated system is used to prepare samples, follow the manufacturer's operating instructions, but all extraction and elution steps must be the same as in the manual procedure. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. If an automated system is used, the MBs should be rotated among the ports to ensure that all the valves and tubing meet the MB requirements (Sect. 9.2).

10.1.2 Some of the PFAS's adsorb to surfaces, including polypropylene. Therefore, the aqueous sample bottles must be rinsed with the elution solvent (Sect 10.3.4) whether extractions are performed manually or by automation. The bottle rinse is passed through the cartridge to elute the method analytes and is then collected (Sect. 10.3.4).

10.1.3 **NOTE:** The SPE cartridges and sample bottles described in this section are designed as single use items and should be discarded after use. They may not be refurbished for reuse in subsequent analyses.

10.2 Sample Preparation and Extraction of Aqueous Samples

10.2.1 Samples are preserved, collected and stored as presented in Section 6.

The entire sample that is received must be sent through the SPE cartridge. In addition, the bottle must be solvent rinsed and this rinse must be sent through the SPE cartridge as well. The method blank (MB) and laboratory control sample (LCS) must be extracted in exactly the same manner (i.e., must include the bottle solvent rinse). It should be noted that a water rinse alone is not sufficient. This does not apply to samples with high concentrations of PFAS that are prepared using serial dilution and not SPE.

10.2.2 Determine sample volume. Weigh all samples to the nearest 1g. If visible sediment is present, centrifuge and decant into a new 250mL HDPE bottle and record the weight of the new container.

NOTE: Some of the PFAS's adsorb to surfaces, thus the sample volume may **NOT** be transferred to a graduated cylinder for volume measurement.

10.2.3 The MB, LCS and FRB may be prepared by measuring 250 mL of reagent water with a polypropylene graduated cylinder or filling a 250-mL sample bottle to near the top.

10.2.4 Adjust the QC and sample pH to 3 by adding acetic acid in water dropwise

10.2.5 Add 20 µL of the EIS PDS (Sect. 8.2.2) to each sample and QC, cap and invert to mix.

10.2.6 If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.3). Cap and invert each sample to mix.

10.3 Cartridge SPE Procedure

10.3.1 CARTRIDGE CLEAN-UP AND CONDITIONING – DO NOT allow cartridge packing material to go dry during any of the conditioning steps. Rinse each cartridge with 3 X 5 mL of 2% ammonium hydroxide in methanol, followed by 5mls of methanol. Next, rinse each cartridge with 5 mls of the 25 mM acetate buffer, followed by 15 mL of reagent water, without allowing the water to drop below the top edge of the packing. If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Add 4-5 mL of reagent water to each cartridge, attach the sample transfer tubes (Sect. 7.9.3), turn on the vacuum, and begin adding sample to the cartridge.

10.3.2 SAMPLE EXTRACTON – Adjust the vacuum so that the approximate flow rate is approximately 4 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.3.3 SAMPLE BOTTLE AND CARTRIDGE RINSE – After the entire sample has passed through the cartridge, rinse the sample bottles with 4 ml reagent water followed by 4 ml 25 mM acetate buffer at pH 4 and draw the aliquot through the sample transfer tubes and the cartridges. Draw air or nitrogen through the cartridge for 5-10 min at high vacuum (10-15 in. Hg). **NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the entire sample has passed through the cartridge, the reservoirs must be rinsed to waste with reagent water.**

10.3.4 SAMPLE BOTTLE AND CARTRIDGE ELUTION, Fraction 1 – Turn off and release the vacuum. Lift the extraction manifold top and insert a rack with collection tubes into the extraction tank to collect the extracts as they are eluted from the cartridges. Rinse the sample bottles with 12 mls of methanol and draw the aliquot through the sample transfer tubes and cartridges. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion.

SAMPLE BOTTLE AND CARTRIDGE ELUTION, Fraction 2 In a separate collection vial, rinse the sample bottles with 12 mL of 2% ammonium hydroxide in methanol and elute the analytes from the cartridges by pulling the 4 mL of methanol through the sample transfer tubes and the cartridges. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion. To the final extract, add 50 ul of acetic acid.

NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the reservoirs have been rinsed in Section 10.3.3, the elution solvent used to rinse the sample bottles must be swirled down the sides of the reservoirs while eluting the cartridge to ensure that any method analytes on the surface of the reservoirs are transferred to the extract.

CLEAN-UP CARTRIDGE ELUTION, Elute the clean-up cartridge with 8 additional mls of methanol and draw the aliquot through the cartridge. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion.

10.3.5 Fractions 1 and 2 are to be combined during the concentration stage (section10.6)

10.4 Sample Prep and Extraction Protocol for Soils

10.4.1 Homogenize and weigh 2 grams of sample (measured to the nearest hundredth of a gram) intoa 50 ml polypropylene centrifuge tube. For laboratory control blanks and spikes, 2 grams of clean sand is used.

10.4.2 Add 20 µL of the EIS PDS (Sect. 8.2.2) to each sample and QC.

10.4.3 If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.3). Cap and invert each sample to mix.

10.4.4 To all samples, add 10 mls of methanol, cap, vortex for 25 seconds at 3000RPM and mix for 30 minutes using a shaker table of tumbler at 120RPM.

10.4.5 Following mixing, sonicate each sample for 30 minutes and let samples sit overnight (at least 2 hours is required for RUSH samples).

10.4.6 Centrifuge each sample at 3500RPM for 10 minutes.

10.4.7 Remove supernatant, and reserve for clean-up.

10.5 Extract Clean-up

10.5.1 CARTRIDGE CLEAN-UP AND CONDITIONING –. Rinse each cartridge with 15 mL of methanol and discard. If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Attach the sample transfer tubes (Sect. 7.9.3), turn on the vacuum, and begin adding sample to the cartridge.

10.5.2 Adjust the vacuum so that the approximate flow rate is 1-2 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.5.3 SAMPLE BOTTLE AND CARTRIDGE RINSE – After the entire sample has passed through the cartridge, rinse the sample collection vial with two 1-mL aliquots of methanol and draw each aliquot through the cartridges. Draw air or nitrogen through the cartridge for 5 min at high vacuum (10-15 in. Hg).

10.5.4 If extracts are not to be immediately evaporated, cover collection tubes and store at ambient temperature till concentration.

10.6 Extract Concentration

10.6.1 Concentrate the extract to dryness under a gentle stream of nitrogen in a heated water bath (60-65 °C) to remove all the water/methanol mix. Add the appropriate amount of 80:20% (vol/vol) methanol:water solution and 20 µl of the ID REC PDS (Sect. 8.2.7) to the collection vial to bring the volume to 1 mL and vortex. Transfer two aliquots with a plastic pipet (Sect. 7.6) into 2 polypropylene autosampler vials.

NOTE: It is recommended that the entire 1-mL aliquot not be transferred to the autosampler vial because the polypropylene autosampler caps do not reseal after injection. Therefore, do not store the extracts in the autosampler vials as evaporation losses can occur occasionally in these autosampler vials. Extracts can be split between 2 X 700 µl vials (Sect. 7.4).

10.7 Sample Volume Determination

10.7.1 If the level of the sample was marked on the sample bottle, use a graduated cylinder to measure the volume of water required to fill the original sample bottle to the mark made prior to extraction. Determine to the nearest 10 mL.

10.7.2 If using weight to determine volume, weigh the empty bottle to the nearest 10 g and determine the sample weight by subtraction of the empty bottle weight from the original sample weight (Sect. 10.2.2). Assume a sample density of 1.0 g/mL. In either case, the sample volume will be used in the final calculations of the analyte concentration (Sect. 11.2).

10.8 Initial Calibration - Demonstration and documentation of acceptable initial calibration is required before any samples are analyzed. After the initial calibration is successful, a CCV is required at the beginning and end of each period in which analyses are performed, and after every tenth Field Sample.

10.8.1 ESI-MS/MS TUNE

10.8.1.1 Calibrate the mass scale of the MS with the calibration compounds and procedures prescribed by the manufacturer.

10.8.1.2 Optimize the [M-H]- for each method analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.4 mL/min). This tune can be done on a mix of the method analytes. The MS parameters (voltages, temperatures, gas flows, etc.) are varied until optimal analyte responses are determined. The method analytes may have different optima requiring some compromise between the optima.

10.8.1.3 Optimize the product ion for each analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.4 mL/min). This tune can be done on a mix of the method analytes. The MS/MS parameters (collision gas pressure, collision energy, etc.) are varied until optimal analyte responses are determined. Typically, the carboxylic acids have very similar MS/MS conditions and the sulfonic acids have similar MS/MS conditions.

10.8.2 Establish LC operating parameters that optimize resolution and peak shape. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

Cautions: LC system components, as well as the mobile phase constituents, contain many of the method analytes in this method. Thus, these PFAS's will build up on the head of the LC column during mobile phase equilibration. To minimize the background PFAS peaks and to keep background levels constant, the time the LC column sits at initial conditions must be kept constant and as short as possible (while ensuring reproducible retention times). In addition, prior to daily use, flush the column with 100% methanol for at least 20 min before initiating a sequence. It may be necessary on some systems to flush other LC components such as wash syringes, sample needles or any other system components before daily use.

10.8.3 Inject a mid-level CAL standard under LC/MS conditions to obtain the retention times of each method analyte. If analyzing for PFTA, ensure that the LC conditions are adequate to prevent co-elution of PFTA and the mobile phase interferants. These interferants have the same precursor and products ions as PFTA, and under faster LC conditions may co-elute with PFTA. Divide the chromatogram into retention time windows each of which contains one or more chromatographic peaks. During MS/MS analysis, fragment a small number of selected precursor ions ([M-H]-) for the analytes in each window and choose the most abundant product ion. For maximum sensitivity, small mass windows of ±0.5 daltons around the product ion mass were used for quantitation.

10.8.4 Inject a mid-level CAL standard under optimized LC/MS/MS conditions to ensure that each method analyte is observed in its MS/MS window and that there are at least 10 scans across the peak for optimum precision.

10.8.4.1 If broad, split or fronting peaks are observed for the first two eluting chromatographic peaks (if only two analytes are being analyzed, both must be evaluated), change the initial mobile phase conditions to higher aqueous content until the peak asymmetry ratio for each peak is 0.8 – 1.5. The peak asymmetry factor is calculated as described in Section 9.9.1 on a mid-level CAL standard. The peak asymmetry factor must meet the above criteria for the first two eluting peaks during the IDL and every time a new calibration curve is generated. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

NOTE: PFHxS, PFOS, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to chromatographic resolution of the linear and branched isomers of these compounds. Most PFAS's are produced by two different processes. One process gives rise to linear PFAS's only while the other process produces both linear and branched isomers. Thus, both branched and linear PFAS's can potentially be found in the environment. For the aforementioned compounds that give rise to more than one peak, all the chromatographic peaks observed in the standard must be integrated and the areas totaled. Chromatographic peaks in a sample must be integrated in the same way as the CAL standard.

10.8.5 Prepare a set of CAL standards as described in Section 8.2.5. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity.

10.8.6 The LC/MS/MS system is calibrated using the IS technique. Use the LC/MS/MS data system software to generate a linear regression or quadratic calibration curve for each of the analytes. This curve **must always** be forced through zero and may be concentration weighted, if necessary. Forcing zero allows for a better estimate of the background levels of method analytes. A minimum of 5 levels are required for a linear calibration model and a minimum of 6 levels are required for a quadratic calibration model.

10.8.7 **CALIBRATION ACCEPTANCE CRITERIA** – A linear fit is acceptable if the coefficient of determination (r^2) is greater than 0.99. When quantitated using the initial calibration curve, each calibration point, except the lowest point, for each analyte should calculate to be within 70-130% of its true value. The lowest CAL point should calculate to be within 50-150% of its true value. If these criteria cannot be met, the analyst will have difficulty meeting ongoing QC criteria. It is recommended that corrective action is taken to reanalyze the CAL standards, restrict the range of calibration, or select an alternate method of calibration (forcing the curve through zero is still required).

10.8.7.1 **CAUTION:** When acquiring MS/MS data, LC operating conditions must be carefully reproduced for each analysis to provide reproducible retention times. If this is not done, the correct ions will not be monitored at the appropriate times. As a precautionary measure, the chromatographic peaks in each window must not elute too close to the edge of the segment time window.

10.9 CONTINUING CALIBRATION CHECK (CCV) – Minimum daily calibration verification is as follows. Verify the initial calibration at the beginning and end of each group of analyses, and after every tenth sample during analyses. In this context, a “sample” is considered to be a Field Sample. MBs, CCVs, LCSs, MSs, FDs FRBs and MSDs are not counted as samples. The beginning CCV of each analysis batch must be at or below the RL in order to verify instrument sensitivity prior to any analyses. If standards have been prepared such that all low CAL points are not in the same CAL solution, it may be necessary to analyze two CAL standards to meet this requirement. Alternatively, the analyte concentrations in the analyte PDS may be customized to meet these criteria. Subsequent CCVs should alternate between a medium and Low concentration CAL standard.

10.9.1 Inject an aliquot of the appropriate concentration CAL standard and analyze with the same conditions used during the initial calibration.

10.9.2 Calculate the concentration of each analyte and EIS in the CCV. The calculated amount for each analyte for medium level CCVs must be within ± 30% of the true value with an allowance of 10% of the reported analytes to be greater than 30%, but less than 40%. The calculated amount for each EIS must be within ± 50% of the true value. The calculated amount for the lowest calibration point for each analyte must be within ± 50%. If these conditions do not exist, then all data for the problem analyte must be considered invalid, and remedial action should be taken (Sect. 10.7.4) which may require recalibration. Any Field or QC Samples that have been analyzed since the last acceptable calibration verification should be reanalyzed after adequate calibration has been restored, with the following exception. **If the CCV fails because the calculated concentration is greater than 130% (150% for the low-level CCV) for a particular method analyte, and Field Sample extracts show no detection for that method analyte, non-detects may be reported without re-analysis.**

10.9.3 REMEDIAL ACTION – Failure to meet CCV QC performance criteria may require remedial action. Major maintenance, such as cleaning the electrospray probe, atmospheric pressure ionization source, cleaning the mass analyzer, replacing the LC column, etc., requires recalibration (Sect 10.6) and verification of sensitivity by analyzing a CCV at or below the RL (Sect 10.7).

10.10 EXTRACT ANALYSIS

10.10.1 Establish operating conditions equivalent to those summarized in Tables 6-8 of Section 16. Instrument conditions and columns should be optimized prior to the initiation of the IDC.

10.10.2 Establish an appropriate retention time window for each analyte. This should be based on measurements of actual retention time variation for each method analyte in CAL standard solutions analyzed on the LC over the course of time. A value of plus or minus three times the standard deviation of the retention time obtained for each method analyte while establishing the initial calibration and completing the IDC can be used to calculate a suggested window size. However, the experience of the analyst should weigh heavily on the determination of the appropriate retention window size.

10.10.3 Calibrate the system by either the analysis of a calibration curve (Sect. 10.6) or by confirming the initial calibration is still valid by analyzing a CCV as described in Section 10.7. If establishing an initial calibration, complete the IDC as described in Section 13.2.

10.10.4 Begin analyzing Field Samples, including QC samples, at their appropriate frequency by injecting the same size aliquots under the same conditions used to analyze the CAL standards.

10.10.5 At the conclusion of data acquisition, use the same software that was used in the calibration procedure to identify peaks of interest in predetermined retention time windows. Use the data system software to examine the ion abundances of the peaks in the chromatogram. Identify an analyte by comparison of its retention time with that of the corresponding method analyte peak in a reference standard.

10.10.6 The analyst must not extrapolate beyond the established calibration range. If an analyte peak area exceeds the range of the initial calibration curve, the sample should be re-extracted with a reduced sample volume in order to bring the out of range target analytes into the calibration range. If a smaller sample size would not be representative of the entire sample, the following options are recommended. Re-extract an additional aliquot of sufficient size to insure that it is representative of the entire sample. Spike it with a higher concentration of internal standard. Prior to LC/MS analysis, dilute the sample so that it has a concentration of internal standard equivalent to that present in the calibration standard. Then, analyze the diluted extract.

11. Data Evaluation, Calculations and Reporting

11.1 Complete chromatographic resolution is not necessary for accurate and precise measurements of analyte concentrations using MS/MS. In validating this method, concentrations were calculated by measuring the product ions listed in Table 7.

11.2 Calculate analyte concentrations using the multipoint calibration established in Section 10.6. Do not use daily calibration verification data to quantitate analytes in samples. Adjust final analyte concentrations to reflect the actual sample volume determined in Section 10.6 where:

C_{ex} = (Area of target analyte * Concentration of Labeled analog) / (area of labeled analog * CF)

C_s = (C_{ex} / sample volume in ml) * 1000

C_{ex} = The concentration of the analyte in the extract
CF = calibration factor from calibration.

11.3 Prior to reporting the data, the chromatogram should be reviewed for any incorrect peak identification or poor integration.

11.4 PFHxS, PFOS, PFOA, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to the linear and branch isomers of these compounds (Sect. 10.6.4.1). The areas of all the linear and branched isomer peaks observed in the CAL standards for each of these analytes must be summed and the concentrations reported as a total for each of these analytes.

11.5 Calculations must utilize all available digits of precision, but final reported concentrations should be rounded to an appropriate number of significant figures (one digit of uncertainty), typically two, and not more than three significant figures.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

12.1 Section 9.0 outlines sample batch QC acceptance criteria. If non-compliant organic compound results are to be reported, the Organic Section Head and/or the Laboratory Director, and the Operations Manager must approve the reporting of these results. The laboratory Project Manager shall be notified, and may choose to relay the non-compliance to the client, for approval, or other corrective action, such as re-sampling and re-analysis. The analyst, Data Reviewer, or Department Supervisor performing the secondary review initiates the project narrative, and the narrative must clearly document the non-compliance and provide a reason for acceptance of these results.

12.2 All results for the organic compounds of interest are reportable without qualification if extraction and analytical holding times are met, preservation requirements (including cooler temperatures) are met, all QC criteria are met, and matrix interference is not suspected during extraction or analysis of the samples. If any of the below QC parameters are not met, all associated samples must be evaluated for re-extraction and/or re-analysis.

13. Method Performance

13.1 Detection Limit Study (DL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

13.1.1 The laboratory follows the procedure to determine the DL, LOD, and/or LOQ as outlined in Alpha SOP ID 1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

13.2.1 The IDC must be successfully performed prior to analyzing any Field Samples. Prior to conducting the IDC, the analyst must first generate an acceptable Initial Calibration following the procedure outlined in Section 10.6.

13.2.2 INITIAL DEMONSTRATION OF LOW SYSTEM BACKGROUND – Any time a new lot of SPE cartridges, solvents, centrifuge tubes, disposable pipets, and autosampler vials are used, it must be demonstrated that an MB is reasonably free of contamination and that the criteria in Section 9.2.1 are met. If an automated extraction system is used, an MB should be extracted on each port to ensure that all the valves and tubing are free from potential PFAS contamination.

13.2.3 INITIAL DEMONSTRATION OF PRECISION (IDP) – Prepare, extract, and analyze four to seven replicate LCSs fortified near the midrange of the initial calibration curve according to the procedure described in Section 10. Sample preservatives as described in Section 6.2.1 must be added to these samples. The relative standard deviation (RSD) of the results of the replicate analyses must be less than 20%.

13.2.4 INITIAL DEMONSTRATION OF ACCURACY (IDA) – Using the same set of replicate data generated for Section 13.2.3, calculate average recovery. The average recovery of the replicate values must be within ± 30% of the true value.

13.2.5 INITIAL DEMONSTRATION OF PEAK ASYMMETRY FACTOR – Peak asymmetry factors must be calculated using the equation in Section 9.10.1 for the first two eluting peaks (if only two analytes are being analyzed, both must be evaluated) in a mid-level CAL standard. The peak asymmetry factors must fall in the range of 0.8 to 1.5. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.

13.2.6 Refer to Alpha SOP ID 1739 for further information regarding IDC/DOC Generation.

13.2.7 The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

14.1 Refer to Alpha's Chemical Hygiene Plan and Hazardous Waste Management and Disposal SOP for further pollution prevention and waste management information.

14.2 This method utilizes SPE to extract analytes from water. It requires the use of very small volumes of organic solvent and very small quantities of pure analytes, thereby minimizing the potential hazards to both the analyst and the environment as compared to the use of large volumes of organic solvents in conventional liquid-liquid extractions.

14.3 The analytical procedures described in this method generate relatively small amounts of waste since only small amounts of reagents and solvents are used. The matrices of concern are finished drinking water or source water. However, laboratory waste management practices must be conducted consistent with all applicable rules and regulations, and that laboratories protect the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Also, compliance is required with any sewage discharge permits and regulations, particularly the hazardous waste identification rules and land disposal restrictions.

15. Referenced Documents

Chemical Hygiene Plan – ID 2124

SOP ID 1732 Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) SOP

SOP ID 1739 Demonstration of Capability (DOC) Generation SOP

SOP ID 1728 Hazardous Waste Management and Disposal SOP

16. Attachments

Table 7: LC Method Conditions

Time (min)	2 mM Ammonium Acetate (5:95 MeOH/H_2O)	100% Methanol
Initial	100.0	0.0
1.0	100.0	0.0
2.2	85.0	15.0
11	20.0	80.0
11.4	0.0	100.0
12.4	100.0	00.0
15.5	100.0	0.0
Waters Aquity UPLC ® BEHC_{18} 2.1 x 50 mm packed with 1.7 µm BEH C_{18} stationary phase Flow rate of 0.4 mL/min 2-5 µL injection		

Table 8: ESI-MS Method Conditions

ESI Conditions	
Polarity	Negative ion
Capillary needle voltage	.5 kV
Cone Gas Flow	25 L/hr
Nitrogen desolvation gas	1000 L/hr
Desolvation gas temp.	500 ºC

Table 9: Method Analyte Source, Retention Times (RTs), and EIS References

#	Analyte	Transition	RT	IS	Type
1	M3PBA	216>171	2.65		REC
2	PFBA	213 > 169	2.65	2: M4PFBA	
3	M4PFBA	217 > 172	2.65	1: M3PBA	EIS
4	PFPeA	263 > 219	5.67	4: M5PFPEA	
5	M5PFPEA	268 > 223	5.66	1: M3PBA	EIS
6	PFBS	299 > 80	6.35	6: M3PFBS	
7	M3PFBS	302 > 80	6.35	29:M4PFOS	EIS
8	FtS 4:2	327 > 307	7.47	9: M2-4:2FTS	

#	Analyte	Transition	RT	IS	Type
9	M2-4:2FTS	329 > 81	7.47	29:M4PFOS	EIS
10	PFHxA	303 > 269	7.57	10: M5PFHxA	
11	M5PFHxA	318 > 273	7.57	19:M2PFOA	EIS
12	PFPeS	349 > 80	7.88	18: M3PFHxS	
13	PFHpA	363 > 319	8.80	14: M4PFHpA	
14	M4PFHpA	367 > 322	8.80	19:M2PFOA	EIS
15	L-PFHxS	399 > 80	8.94	18: M3PFHxS	
16	br-PFHxS	399 > 80	8.72	18: M3PFHxS	
17	PFHxS Total	399 > 80	8.94	18: M3PFHxS	
18	M3PFHxS	402 > 80	8.94	29:M4PFOS	EIS
19	MPFOA	415 > 370	9.7		REC
20	PFOA	413 > 369	9.7	23: M8PFOA	
21	br-PFOA	413 > 369	9.48	23: M8PFOA	
22	PFOA Total	413 > 369	9.7	23: M8PFOA	
23	M8PFOA	421 > 376	9.7	19: M2PFOA	EIS
24	FtS 6:2	427 > 407	9.66	25: M2-6:2FTS	
25	M2-6:2FTS	429 > 409	9.66	29:M4PFOS	EIS
26	PFHpS	449 > 80	9.78	33: M8PFOS	
27	PFNA	463 > 419	10.41	33: M8PFOS	
28	M9PFNA	472 > 427	10.41	19: M2PFOA	EIS
29	M4PFOS	501 > 80	10.45		REC
30	PFOS	499 > 80	10.45	33: M8PFOS	
31	br-PFOS	499 > 80	10.27	33: M8PFOS	
32	PFOS Total	499 > 80	10.45	33: M8PFOS	
33	M8PFOS	507 > 80	10.45	29: M4PFOS	EIS
34	FtS 8:2	527 > 507	10.99	38: M2-8:2FTS	
35	M2-8:2FTS	529 > 509	10.99	29:M4PFOS	EIS
36	M2PFDA	515 > 470	11.00		REC
37	PFDA	513 > 469	11.00	38: M6PFDA	
38	M6PFDA	519 > 474	11.00	36: M2PFDA	EIS
39	PFNS	549 > 80	11.02	33:M8PFOS	
40	NMeFOSAA	570 > 419	11.41	41: D3-NMeFOSAA	
41	d3-NMeFOSAA	573 > 419	11.41	36: M2PFDA	EIS
42	PFOSA	498 > 78	11.48	29: M8FOSA	
43	M8FOSA	506 > 78	11.48	19: M2PFOA	EIS
44	PFUnDA	563 > 519	11.51	41: M7-PFUDA	
45	M7-PFUDA	570 > 525	11.51	36: M2PFDA	EIS
46	PFDS	599 > 80	11.51	33:M8PFOS	
47	NEtFOSAA	584 > 419	11.68	48: d5-NEtFOSAA	

#	Analyte	Transition	RT	IS	Type
48	d5-NEtFOSAA	589 > 419	11.68	36: M2PFDA	EIS
49	PFDoA	613 > 569	11.96	50: MPFDOA	
50	MPFDOA	615 > 570	11.96	36: M2PFDA	EIS
51	PFTriA	663 > 619	12.34	50: MPFDOA	
52	PFTeA	713 > 669	12.6	53: M2PFTEDA	
53	M2PFTEDA	715 > 670	12.6	36: M2PFDA	EIS
54	M3HFPO-DA	329>285	7.97	19: M2PFOA	EIS
55	HFPO-DA	332>287	7.97	54: M3HFPO-DA	
56	ADONA	377>251	8.00	23: M8PFOA	
57	PFHxDA	813>769	13.20	59: M2PFHxDA	
58	PFODA	913>869	13.50	59: M2PFHxDA	
59	M2PFHxDA	815>770	13.20	36:M2PFDA	EIS
60	NEtFOSA	526>169	11.00	61: NMeFOSA	
61	NMeFOSA	512>169	10.50	63: d3-NMeFOSA	
62	d3-NMeFOSA	515>169	10.50	29: M4PFOS	EIS
63	d5-NEtFOSA	531>169	11.00	29: M4PFOS	EIS
64	NMeFOSE	556>122	11.25	66: d7-NMeFOSE	
65	NEtFOSE	570>136	10.75	67: d9-NEtFOSE	
66	d7-NMeFOSE	563>126	11.25	29: M4PFOS	EIS
67	d9-NEtFOSE	579>142	10.75	29: M4PFOS	EIS
68	FtS 10:2	627>607	11.50	25: M2-6:2FTS	
69	PFDoS	699>99	12.50	33: M8PFOS	

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

January 2021

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New York State of Opportunity | Department of Environmental Conservation

ERRATA SHEET for

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Routine Analysis, page 9	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101."	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533."	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	"In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils."	9/15/2020
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Water Sample Results Page 10	PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (…) If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (…) If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	9/15/2020
Soil Sample Results, page 10	"The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase."	"Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. " [Interim SCO Table] "PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP. As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. "	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Testing for Imported Soil Page 11	Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs. If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable. PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. [2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020
Additional Analysis, page 9	In cases… soil parameters, such as Total Organic Carbon (EPA Method 9060), soil…	In cases… soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil…	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix F) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS in matrices other than finished drinking water. However, laboratories analyzing environmental samples for PFAS (e.g., soil, sediments, and groundwater) under DER's Part 375 remedial programs need to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533. Laboratories should adhere to the guidelines and criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids). Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist.

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.[1]

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below. In addition, further assessment of water may be warranted if either of the following screening levels are met:

a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or
b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values.

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater[2]	1.1	3.7

[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.
[2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf.

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
    - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an "Analytical Methods/Quality Assurance Summary Table" specifying:
    - Matrix type
    - Number or frequency of samples to be collected per matrix
    - Number of field and trip blanks per matrix
    - Analytical parameters to be measured per matrix
    - Analytical methods to be used per matrix with minimum reporting limits
    - Number and type of matrix spike and matrix spike duplicate samples to be collected
    - Number and type of duplicate samples to be collected
    - Sample preservation to be used per analytical method and sample matrix
    - Sample container volume and type to be used per analytical method and sample matrix
    - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by LC-MS/MS for PFAS using methodologies based on EPA Method 537.1
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
    - Reporting Limits should be less than or equal to:
        - Aqueous – 2 ng/L (ppt)
        - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101
- Include detailed sampling procedures
    - Precautions to be taken
    - Pump and equipment types
    - Decontamination procedures
    - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled "General Fish Handling Procedures for Contaminant Analysis" (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

   1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

   2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

   3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

   1. Project and Site Name.

   2. DEC Region.

   3. All personnel (and affiliation) involved in the collection.

   4. Method of collection (gill net, hook and line, etc.)

   5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

   1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

   2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

   3. Date collected.

   4. Sample location (waterway and nearest prominent identifiable landmark).

   5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate "Age" column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish's tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:
    No materials containing Teflon.
    No Post-it notes.
    No ice packs; only water ice or dry ice.
    Any gloves worn must be powder free nitrile.
    No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
    No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
    Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
    Wash hands after handling any food containers or packages as these may contain PFCs. Keep pre-wrapped food containers and wrappers isolated from fish handling.
    Wear clothing washed at least six times since purchase.
    Wear clothing washed without fabric softener.
    Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name ____ DEC Region ____________

Collections made by (include all crew) ____

Sampling Method: ☐Electrofishing ☐Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other ______________________

Preservation Method: ☐Freezing ☐Other ______________________ Notes (SWFDB survey number): ______________________

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, ______________________________, of ____ collected the
(Print Name) (Print Business Address)

following on ____________________, 20____ from ____
(Date) (Water Body)

in the vicinity of ____
(Landmark, Village, Road, etc.)

Town of ____, in __________________________________ County.

Item(s) ____

____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on ____________________________________, 20______.

____ ____________________________
Signature Date

I, ___________________________________, received the above mentioned sample(s) on the date specified and assigned identification number(s) ____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

_______________________________________ ___________________
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) developed the following guidelines for laboratories analyzing environmental samples for PFAS under DER programs. If laboratories cannot adhere to the following guidelines, they should contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov prior to analysis of samples.

Isotope Dilution

Isotope dilution techniques should be utilized for the analysis of PFAS in all media.

Extraction

For water samples, the entire sample bottle should be extracted, and the sample bottle rinsed with appropriate solvent to remove any residual PFAS.

For samples with high particulates, the samples should be handled in one of the following ways:

1. Spike the entire sample bottle with isotope dilution analytes (IDAs) prior to any sample manipulation. The sample can be passed through the SPE and if it clogs, record the volume that passed through.
2. If the sample contains too much sediment to attempt passing it through the SPE cartridge, the sample should be spiked with isotope dilution analytes, centrifuged and decanted.
3. If higher reporting limits are acceptable for the project, the sample can be diluted by taking a representative aliquot of the sample. If isotope dilution analytes will be diluted out of the sample, they can be added after the dilution. The sample should be homogenized prior to taking an aliquot.

If alternate sample extraction procedures are used, please contact the DER remedial program chemist prior to employing. Any deviations in sample preparation procedures should be clearly noted in the case narrative.

Signal to Noise Ratio

For all target analyte ions used for quantification, signal to noise ratio should be 3:1 or greater.

Blanks

There should be no detections in the method blanks above the reporting limits.

Ion Transitions

The ion transitions listed below should be used for the following PFAS:

PFOA	413 > 369
PFOS	499 > 80
PFHxS	399 > 80
PFBS	299 > 80
6:2 FTS	427 > 407
8:2 FTS	527 > 507
N-EtFOSAA	584 > 419
N-MeFOSAA	570 > 419

Branched and Linear Isomers

Standards containing both branched and linear isomers should be used when standards are commercially available. Currently, quantitative standards are available for PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As more standards become available, they should be incorporated in to the method. All isomer peaks present in the standard should be integrated and the areas summed. Samples should be integrated in the same manner as the standards.

Since a quantitative standard does not exist for branched isomers of PFOA, the instrument should be calibrated using just the linear isomer and a technical (qualitative) PFOA standard should be used to identify the retention time of the branched PFOA isomers in the sample. The total response of PFOA branched and linear isomers should be integrated in the samples and quantitated using the calibration curve of the linear standard.

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated for each target analyte and the ratio compared to standards. Lab derived criteria should be used to determine if the ratios are acceptable.

Reporting

Detections below the reporting limit should be reported and qualified with a J qualifier.

The acid form of PFAS analytes should be reported. If the salt form of the PFAS was used as a stock standard, the measured mass should be corrected to report the acid form of the analyte.

Appendix I - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report. Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 14 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of five standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%. Linear fit calibration curves should have an R^2 value greater than 0.990.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
R^2 >0.990	J flag detects and UJ non detects
Low-level calibration check <50% or >150%	J flag detects and UJ non detects
Mid-level calibration check <70% or >130%	J flag detects and UJ non detects

Initial Calibration Verification

An initial calibration verification (ICV) standard should be from a second source (if available). The ICV should be at the same concentration as the mid-level standard of the calibration curve.

ICV recovery <70% or >130%	J flag detects and non-detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated from the standards for each target analyte. Lab derived criteria should be used to determine if the ratios are acceptable. If the ratios fall outside of the laboratory criteria, qualify results as an estimated maximum concentration.

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Branched and Linear Isomers

Observed branched isomers in the sample that do not have a qualitative or quantitative standard should be noted and the analyte should be qualified as biased low in the final data review summary report. Note: The branched isomer peak should also be present in the secondary ion transition.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

EPA 537 Field Sampling Guidelines

Sampling for PFAAs via EPA 537 can be challenging due to the prevalence of these compounds in consumer products. The following guidelines are strongly recommended when conducting sampling.

Reference-NHDES https://www.des.nh.gov/organization/divisions/waste/hwrb/documents/pfc-stakeholder-notification-20161122.pdf

Field Clothing and PPE

- No clothing or boots containing Gore-TexTM
- All safety boots made from polyurethane and PVC
- No materials containing Tyvek®
- Do not use fabric softener on clothing to be worn in field
- Do not used cosmetics, moisturizers, hand cream, or other related products the morning of sampling
- Do not use unauthorized sunscreen or insect repellant (see reference above for acceptable products)

Sample Containers

- All sample containers made of HDPE or polypropylene
- Caps are unlined and made of HDPE or polypropylene

Wet Weather (as applicable)

Wet weather gear made of polyurethane and PVC only

Equipment Decontamination

- “PFC-free” water on-site for decontamination of sample equipment. No other water sources to be used.
- Only Alconox and Liquinox can be used as decontamination materials

Food Considerations

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

Other Recommendations

Sample for PFCs first! Other containers for other methods may have PFCs present on their sampling containers

Field Equipment

- Must not contain Teflon® (aka PTFE) or LDPE materials
- All sampling materials must be made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books can be used
- No plastic clipboards, binders, or spiral hard cover notebooks can be used
- No adhesives (i.e.Post-It Notes) can be used
- Sharpies and permanent markers not allowed; regular ball point pens are acceptable
- Aluminum foil must not be used
- Keep PFC samples in separate cooler, away from sampling containers that may contain PFCs
- Coolers filled with regular ice only. Do not use chemical (blue) ice packs.

EPA Method 537 (PFAS) Sampling Instructions

Please read instructions entirely prior to sampling event.

*Sampler must wash hands before wearing nitrile gloves in order to limit contamination during sampling.

Each sample set* requires a set of containers to comply with the method as indicated below.
*sample set is composed of samples collected from the same sample site and at the same time.

Container Count	Container Type	Preservative
3 Sampling Containers - Empty	250 mL container	Pre preserved with 1.25 g Trizma
Reagent Water for Field Blank use	250 mL container	Pre preserved with 1.25 g Trizma
1 Field Blank (FRB) Container - Empty	250 mL container	Unpreserved

**** Sampling container <u>must be filled to the neck</u>. For instructional purposes a black line has been drawn to illustrate the required fill level for each of the 3 Sample containers****

Field blanks are recommended and the containers have been provided, please follow the instructions below.

Field Blank Instructions:

1. Locate the Reagent Water container from the bottle order. The Reagent Water container will be prefilled with PFAS-free water and is preserved with Trizma.
2. Locate the empty container labeled "Field Blank".
3. Open both containers and proceed to transfer contents of the "Reagent Water" container into the "Field Blank" container.
4. If field blanks are to be analyzed, they need to be noted on COC, and will be billed accordingly as a sample.

Both the <u>empty</u> Reagent Water container and the <u>filled</u> Field Blank container must be returned to the laboratory along with the samples taken.

Sampling Instructions:

1. Each sampling event requires 3 containers to be filled to the neck of the provided containers for each sampling location.
2. Before sampling, remove faucet aerator, run water for 5 min, slow water to flow of pencil to avoid splashing and fill sample containers to neck of container (as previously illustrated) and invert 5 times.
3. Do not overfill or rinse the container.
4. Close containers securely. Place containers in sealed ZipLoc bags, and in a separate cooler (no other container types).
5. Ensure Chain-of-Custody and all labels on containers contain required information.Place sample, Field Blank and empty Reagent Blank containers in ice filled cooler (do not use blue ice) and return to the laboratory. Samples should be kept at 4°C ±2. Samples must not exceed 10°C during first 48 hours after collection. Hold time is 14 days.

Please contact your project manager with additional questions or concerns.

APPENDIX G

SITE MANAGEMENT FORMS

SITE INSPECTION CHECKLIST

Site Name:___45 Commercial Street___ Location:___45 Commercial Street, Brooklyn, NY___ Project Number:___170229024

Inspector Name: Date: Weather Conditions: _

Reason for Inspection (i.e., routine, severe weather condition, etc.):____

Check one of the following:
(Y: Yes N: No NA: Not Applicable)

		Y	N	NA	Normal Situation	Remarks
	General					
1	What are the current site conditions?	--	--	--	--	
2	Are all applicable site records (e.g., documentation of construction activity, SMD system maintenance and repair, most current easement, etc.) complete and up to date?					
	Environmental Easement					
3	Has site use (commercial or industrial) remained the same?					
4	Does it appear that all environmental easement restrictions have been followed?					
	Composite Cover, Impermeable Cap & SMD System					
5	Are there any indications of a breach in the capping system at the time of this inspection?					
6	Are there any cracks in the building slabs?					
7	Are there any cracks in the building walls?					
8	Is there any construction activity, or indication of any construction activity within the past certification year (including any tenant improvements), that included breaching the capping system or altering the SMD system at the time of this inspection?					
9	If YES to number 8, is there documentation that the Site Management Plan, HASP, and CAMP for the site was/is being followed?					

*****If the answer to any of the above questions indicate non-compliance with any ICs/ECs for the site, additional remarks must be provided and, where applicable, documentation should be attached to this checklist detailing additional inspection and repair activities.*****

Additional remarks:

Minimum Inspection Schedule:

- At a minimum, site-wide inspections will be conducted annually, per certification year.
- Additional site-wide inspections will also be conducted immediately following severe storm/weather conditions.
- This checklist will be completed as part of each site-wide inspection event.

SMD SYSTEM INSPECTION CHECKLIST

Site Name: 45 Commercial Street Location: 45 Commercial Street, NY Project Number: 170229024

Inspector Name: ____________________________ Date: _______________ Weather Conditions: _______________

Reason for Inspection (i.e., routine, maintenance, severe condition, etc.): ____

Check one of the following: **Y:** Yes **N:** No **NA**: Not Applicable

		Y	N	NA	Normal Situation	Remarks
	Records					
1	Is the Site Management Plan readily available on-site?				Y	
2	Based on site records, when was the last inspection, maintenance, or repair event?					
3	Based on site records, was the system inoperational for any amount of time since the last inspection, maintenance, or repair event? For how long? Provide details.				N	
	Alarm System					
4	Do the alarm lights indicate that the system is operational?				Y	
	General System					
5	Is there any construction activity, or indication of any construction activity within the past certification year (including any tenant improvements), that included the breaching of the floor slab, on-site at the time of this inspection?				N	
6	If YES to number 5, is there documentation that the Soil Management Plan, HASP, and CAMP for the site was/is being followed?				NA if N to 5/ Y if Y to 5	
7	If YES to number 5, is there documentation that all breaches in the floor slab have been sealed?				NA if N to 5/ Y if Y to 5	
8	Does all visible SMD system piping appear intact and undamaged?				Y	
9	Have any intake points been constructed at the roof near (less than 10 feet) the SMD system blower discharge point?				N	

SMD SYSTEM INSPECTION CHECKLIST

Site Name: 45 Commercial Street Location: 45 Commercial Street, NY Project Number: 170229024

Inspector Name: ______________________ Date: ____________ Weather Conditions: ____________

Reason for Inspection (i.e., routine, maintenance, severe condition, etc.): ______________________________

Check one of the following: **Y:** Yes **N:** No **NA**: Not Applicable

		Y	N	NA	Normal Situation	Remarks
	SMD System Blower Unit					
10	Is the SMD system blower operational at the time of the inspection?				Y	
11	What is the VelociCalc Meter reading?					
12	Is the SMD system blower expelling air at the discharge point?				Y	
13	Have dust and debris been removed from surface of blower?				Y	
14	Have dirty or clogged filter cartridges been replaced?				Y	
15	Vacuum Monitoring Point Readings	**Reading**			**Sufficient?**	**Remarks**
	VP-1					
	VP-2					
	VP-3					
	VP-4					
	VP-5					

* **If the answer to any of the above questions indicate the SMD system is non-operational or malfunctioning, or that this EC is in non-compliance,additional remarks must be provided and, where applicable, documentation attached to this checklist detailing additional inspection and repair activities.**

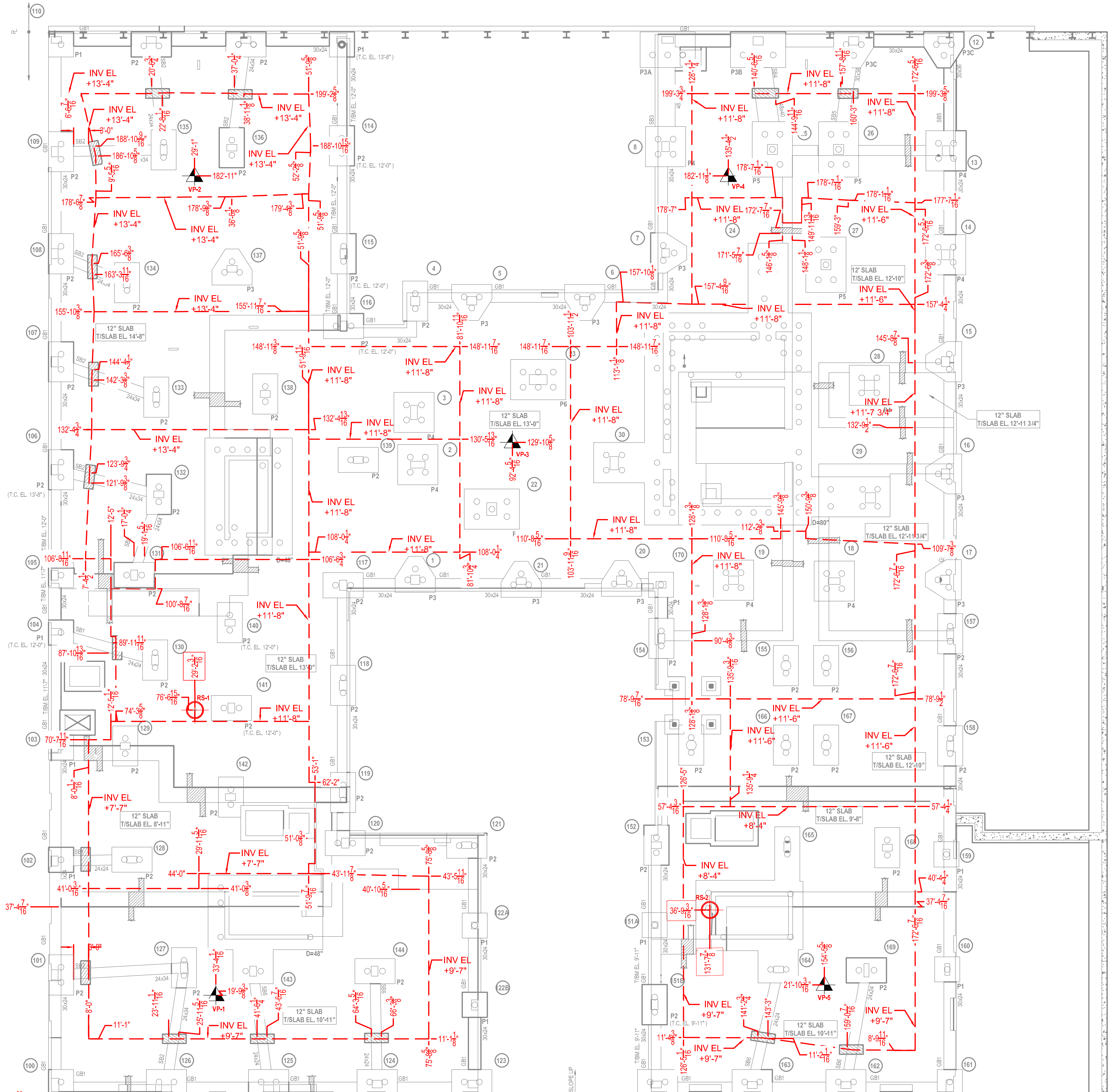
Additional remarks ____

Minimum Inspection Schedule: SMD inspections will be conducted quarterly for the first certification year at a minimum. Additional inspections will also be conducted at times of maintenance, repair, or severe condition events. The minimum schedule will be revised, as necessary, following the first certification year. All inspection events will utilize this checklist.

APPENDIX H

SUB-MEMBRANE DEPRESSURIZATION SYSTEM AS-BUILT DRAWINGS AND CUT SHEETS

Monadnock Construction, Inc. RECEIVED 4/21/2022
Project: Greenpoint Landing H1H2, Submittal No: [312116-01A.1] Page 1 of 2



SECTION 1-1

SCALE 3/32": 1'-0" (1:192)

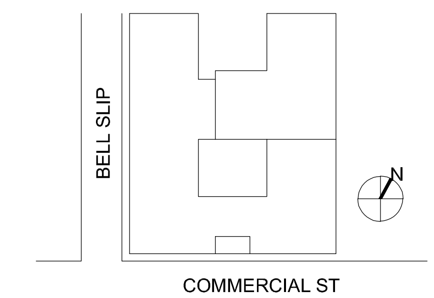
LEGEND:

- 4" PERFORATED PVC PIPE
- RISER PIPE PENETRATION THROUGH FOUNDATION SLAB
- VAPOR MONITORING POINT

STRUCTURE TECH
NEW YORK

500 SEVENTH AVE, 10TH FLOOR
NEW YORK, NY 10018

LOCATION



45 COMMERCIAL ST
BROOKLYN

PROJECT
45 COMMERCIAL ST.

TITLE
UNDER SLAB AS BUILT
SMD LAYOUT

REV.	DATE	STATUS DESCRIPTION
1	03.09.22	MARKUPS

DATE: 12/30/21

BY: AC

CHECKED BY: AC

SCALE:

PROJECT NO. J0500

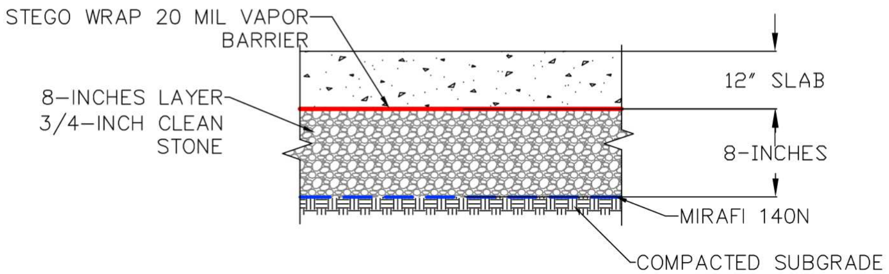
DRAWING NO. SMD1

PAGE 1 OF 1

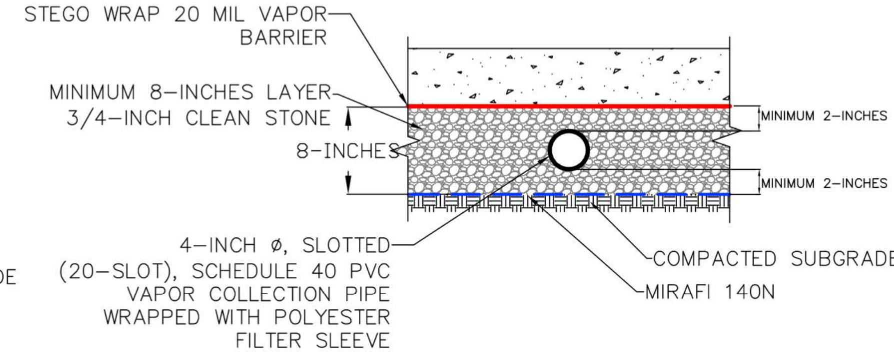
SIGN AND SEAL

STATE OF NEW YORK
JAMES R. SULLIVAN
087168
LICENSED PROFESSIONAL ENGINEER

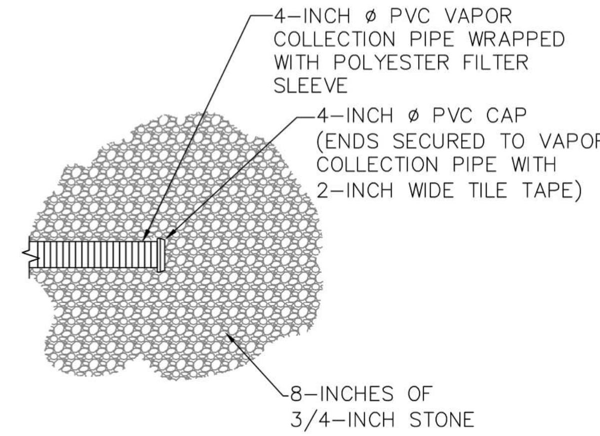
3/16/2022



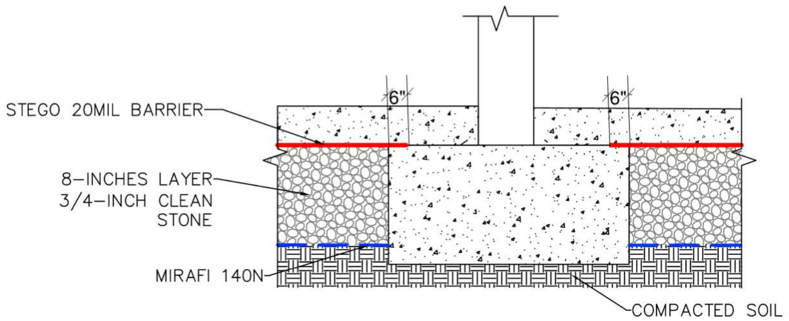
DETAIL 1: TYPICAL SECTION THROUGH SUB-SLAB



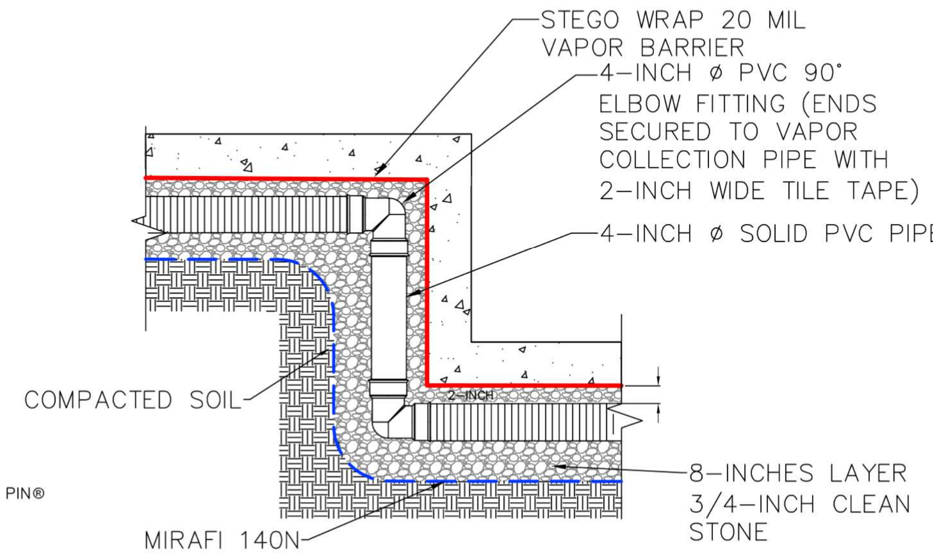
DETAIL 2: TYPICAL SECTION FOR VAPOR COLLECTION PIPE AND VAPOR BARRIER



DETAIL 3: TYPICAL CAP TERMINATION CONNECTION FOR VAPOR COLLECTION PIPE

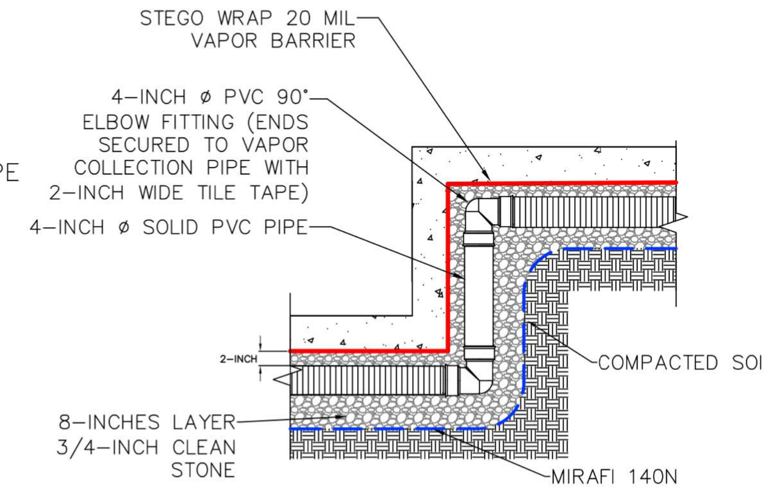


DETAIL 4: RISER PIPE AT INTERIOR FOOTING DETAIL FOR CONCRETE COLUMN IN SOIL



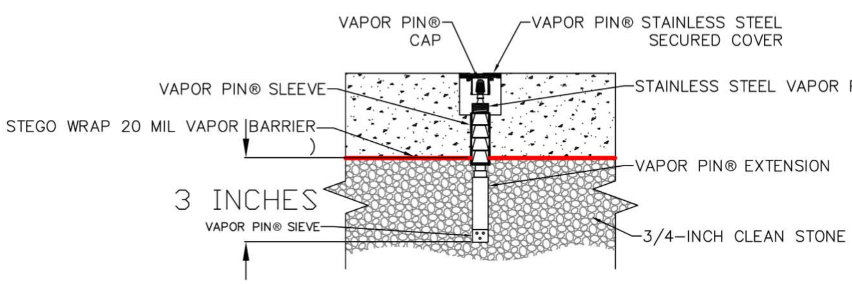
DETAIL 5: TYPICAL SECTION FOR PERFORATED SUBMEMBRANE PIPE AT ELEVATION CHANGE BETWEEN TWO SLABS LESS THAN 2'

NOT TO SCALE



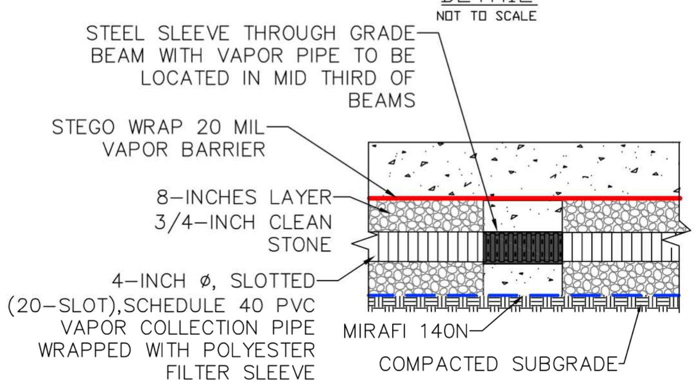
DETAIL 6: TYPICAL SECTION FOR PERFORATED SUBMEMBRANE PIPE AT ELEVATION CHANGE BETWEEN TWO SLABS GREATER THAN 2'

NOT TO SCALE



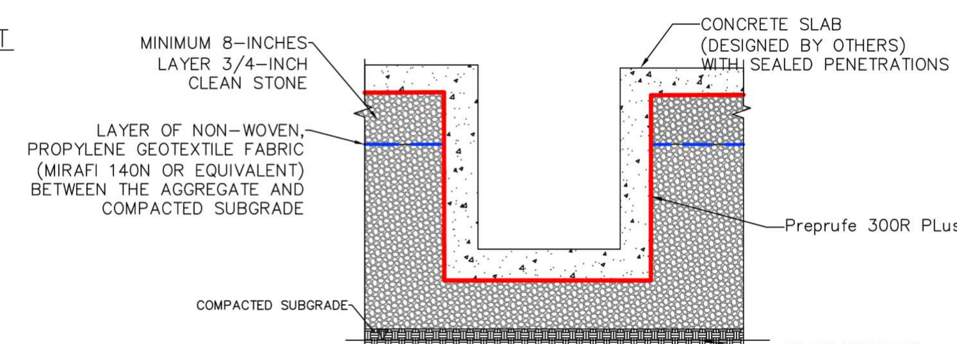
DETAIL 7: VACUUM MONITORING POINT DETAIL

NOT TO SCALE



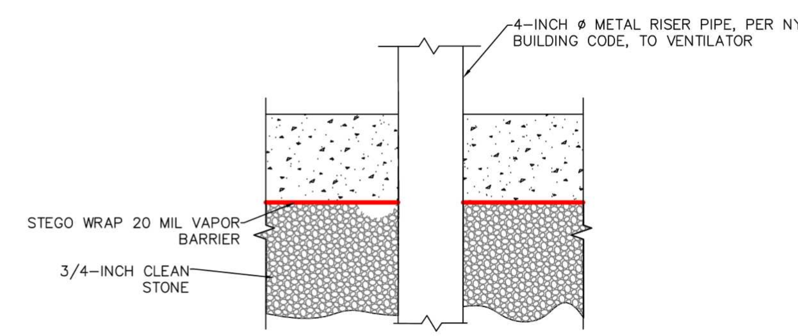
DETAIL 8: PERFORATED PIPE GRADE BEAM PENETRATION DETAIL

NOT TO SCALE

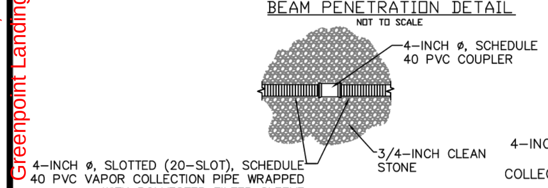


DETAIL 10: TYPICAL ELEVATOR/EJECTOR PIT SECTION (ABOVE GROUNDWATER)

NOT TO SCALE

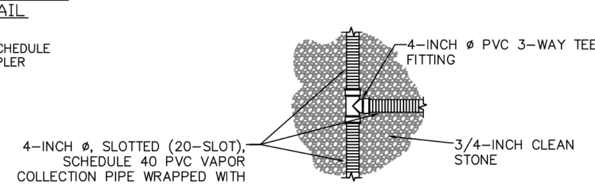


DETAIL 9: RISER PIPE CONNECTION

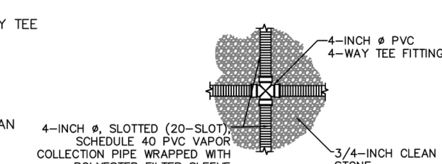


DETAIL 11: TYPICAL COUPLER CONNECTION FOR VAPOR COLLECTION PIPE (PLAN VIEW)

NOT TO SCALE

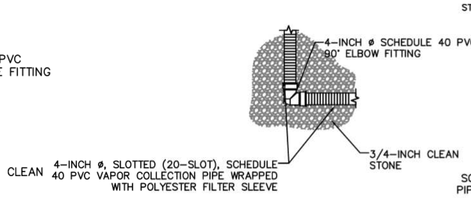


DETAIL 12: TYPICAL 3-WAY TEE FITTING CONNECTION FOR VAPOR COLLECTION PIPE (PLAN VIEW)



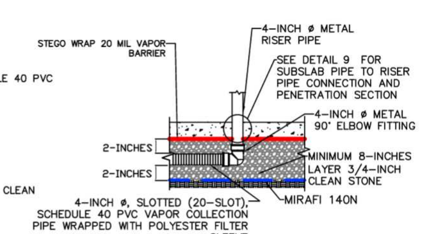
DETAIL 13: TYPICAL 4-WAY TEE FITTING CONNECTION FOR VAPOR COLLECTION PIPE (PLAN VIEW)

NOT TO SCALE



DETAIL 14: TYPICAL 90° ELBOW FITTING CONNECTION FOR VAPOR COLLECTION PIPE (PLAN VIEW)

NOT TO SCALE



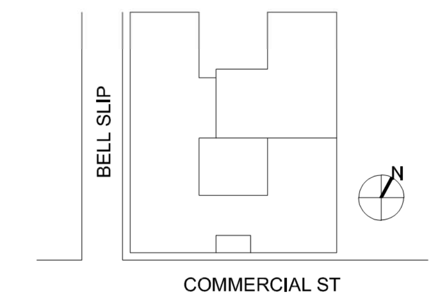
DETAIL 15: TYPICAL SECTION AT SOLID RISER PIPE

NOT TO SCALE

STRUCTURE TECH
NEW YORK

500 SEVENTH AVE, 10TH FLOOR
NEW YORK, NY 10018

LOCATION



45 COMMERCIAL ST
BROOKLYN

PROJECT
45 COMMERCIAL ST.

TITLE
AS BUILT
SMD DETAIL

REV.	DATE	STATUS DESCRIPTION

DATE: 04/19/2022

BY: TD

CHECKED BY: AC

SCALE:

PROJECT NO. J0500

DRAWING NO. SMD2

PAGE 2 OF 2

SIGN AND SEAL

4/19/2022

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Project: Greenpoint Landing H1H2, Submittal No: [312116-01A.1] Page 2 of 2

INNOVATION | DESIGN | SOLUTION

AIRTECH GROUP

AN ISO 9001:2015 CERTIFIED COMPANY

301 Veterans Blvd.
Rutherford, NJ 07070
Tel: (201) 569-1173 Fax: (201) 569-1696

PROJECT SUBMITTAL
H1H2 GREENPOINT LANDING

JOB # 1928
VACUUM BLOWER PACKAGE
1928-A
1-VE-3BA1430-1.3
1928-B
1-VE-3BA1430-1.3

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Specializing in compressed air and vacuum systems

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Project: Greenpoint Landing H1H2, Submittal No: [312116-04] Page 2 of 12

EQUIPMENT DATA

INNOVATION | DESIGN | SOLUTION
AIRTECH GROUP
AN ISO 9001:2015 CERTIFIED COMPANY
301 Veterans Blvd.
Rutherford, NJ 07070

PROJECT **HIH2 GREENPOINT LANDING**

CUSTOMER **ICONIC MECHANICAL SERVICES CORP**

SUB-SLAB VAPOR EXTRACTION SYSTEM

SIMPLEX, BASE MTD. PACKAGE				MOTOR	
MODEL	**1-VE-3BA1430-1.3**			MOTOR HORSEPOWER	**1.3**
PUMP MOD.	**3BA1430-7AT16**			VOLTAGE	**3-60-230V**
CAPACITY (EACH)	**85**	CFM @	**26" H20**	RPM	**3600**
DRIVE TYPE	**DIRECT**			ENCLOSURE	**TEFC**
OPERATING SPEED		**3450**	RPM		

COMPLETE WITH **INLET MUFFLER**		**CONTROL PANEL**	
DISCHARGE MUFFLER, RELIEF VALVE		STARTER PANEL - NEMA	**4/12**
INLET FILTER W/WIRE MESH ELEMENT		MOUNTING	**BASE**
AIR DILUTION VALVE W/SCREEN		STARTER TYPE	**FULL VOLTAGE**
SOUND ENCLOSURE		DISCONNECT	**----**
		CONTROL	**ON/OFF**

SEPARATOR / TANK			
VOLUME	GALL'S.	ACCESSORIES:	**MOTOR RUN LIGHT**
STYLE		**115V CONTROL CIRCUIT TRANSFORMER**	
RATED VACUUM		**AUXILLIARY CONTACT FOR REMOTE ALARM**	
FINISH			
		RELIEF VALVE SET @	**2.5** ("HG)

MISCELLANEOUS:	REMOTE ALARM PANEL	
SUPPLIED LOOSE FOR FIELD INSTALLATION:	NEMA	**12**
(1) SET OF FLEX CONNECTORS	MOUNTING	**REMOTE-WALL**
	VOLTAGE	**1-60-115**
	ALARM	**RED LIGHT**

JOB NO. **1928A** DATE **09/03/21** **SUBMITTED BY:** **K.V.** **SN1**

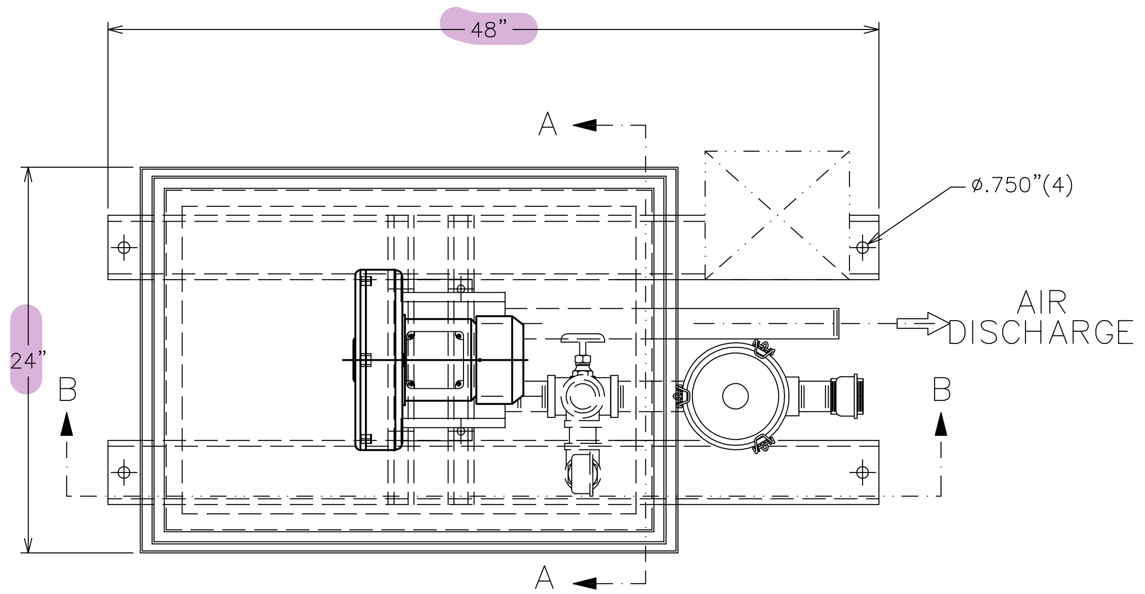
VDA1928A 1-VE-3BA1430-1.3.xls

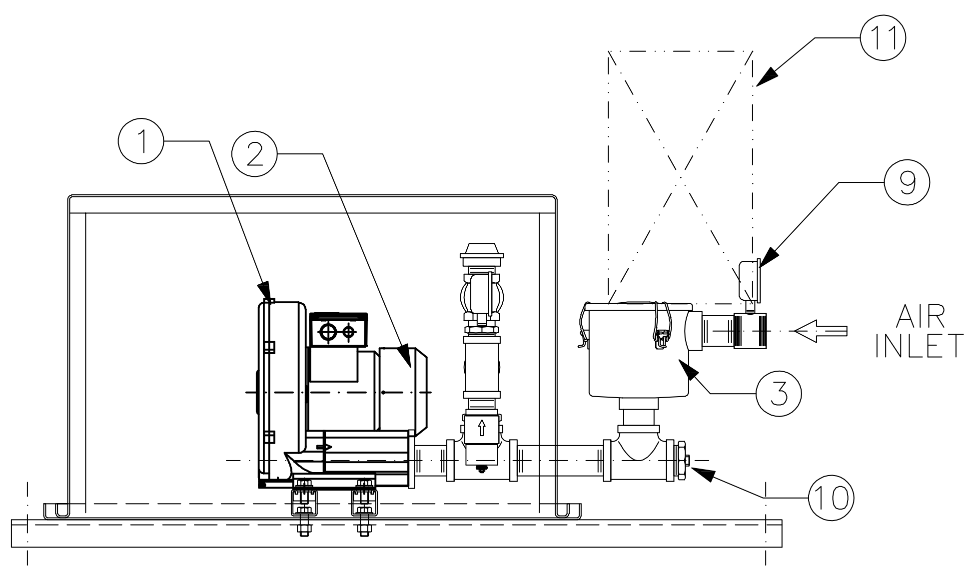
Monadnock Construction, Inc. RECEIVED 9/14/2021
Project: Greenpoint Landing H1H2, Submittal No: [312116-04] Page 3 of 12

Monadnock Construction, Inc. RECEIVED 9/14/2021,
Project: Greenpoint Landing H1H2, Submittal No: [312116-04] Page 4 of 12

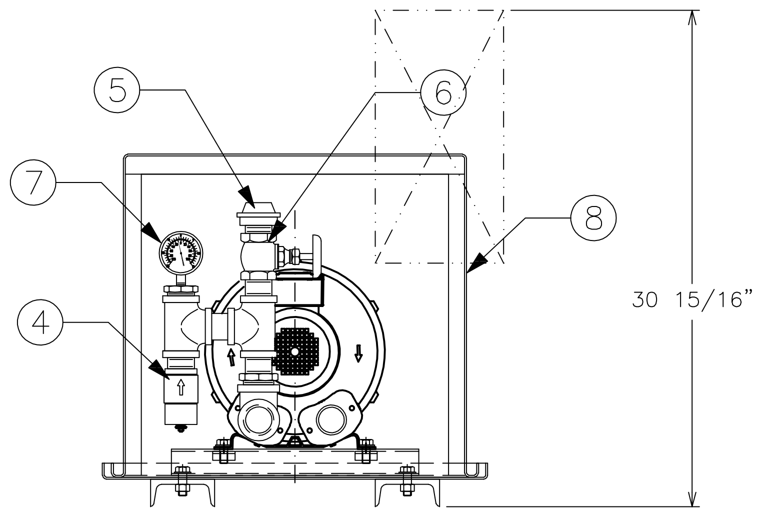
PRODUCTION REVISIONS				
REVISION	DESCRIPTION	DATE	ENG.	APPR.

ITEM	REQ'D	DESCRIPTION	SIZE	PART NO.
1	1	VACUUM BLOWER	1-1/2"	3BA1430-7AT16
2	1	MOTOR	1.3HP	TEFC
3	1	INLET FILTER (WIRE MESH)	1-1/2"	ATF-150-1337
4	1	RELIEF VALVE	1-1/4"	VC51Z-2.5"Hg
5	1	INLET STAINER	1-1/4"	
6	1	AIR BLEED VALVE	1-1/4"	GLOBE
7	1	VACUUM GAUGE	2-1/2"	0-100" WC
8	1	SOUND ENCLOSURE		SD-4
9	1	VACUUM GAUGE	2-1/2"	0-100" WC
10	1	TEST PORT PLUG	1/2"	
11	1	CONTROL PANEL		
A	1	AIR INLET	1-1/2"	
B	1	AIR DISCHARGE	1-1/2"	





SECTION B-B



SECTION A-A

NOTE:
TYPICAL DIMENSIONS ONLY. NOT TO BE USED
FOR CONSTRUCTION WITHOUT CONSULTING
FACTORY. SUBJECT TO CHANGE WITHOUT NOTICE.

PROPRIETARY AND CONFIDENTIAL.
THE INFORMATION CONTAINED IN THIS DRAWING
AND DOCUMENTS IS THE PROPRIETARY PROPERTY OF AIRTECH VACUUM INC.
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SURFACE FINISH
ACC. TO ISO 1302

DIMENSIONS W/O TOLERANCES
ACC. TO ISO 2768 - mH

SCALE: NTS

WEIGHT: APPROX. 275 LBS

MATERIAL: 1-VE-3BA1430-1.3

#	DESCRIPTION	DATE	ENG.	APPR.
0	DRAWING CREATED	9-3-2021	K.V.	A.N.

	DATE	ENG.
DRAWN	9-3-2021	K.V.
CHECKED	9-3-2021	A.N.
		A3

DESCRIPTION:

VACUUM BLOWER PACKAGE
BLOWER A

INNOVATION | DESIGN | SOLUTION
AIRTECH®
AN ISO 9001:2015 CERTIFIED COMPANY GROUP
301 Veterans Blvd, Rutherford NJ 07070
Tel:201-569-1173 | Fax:201-569-1696
www.airtechusa.com

DRW-File: 1928A-1

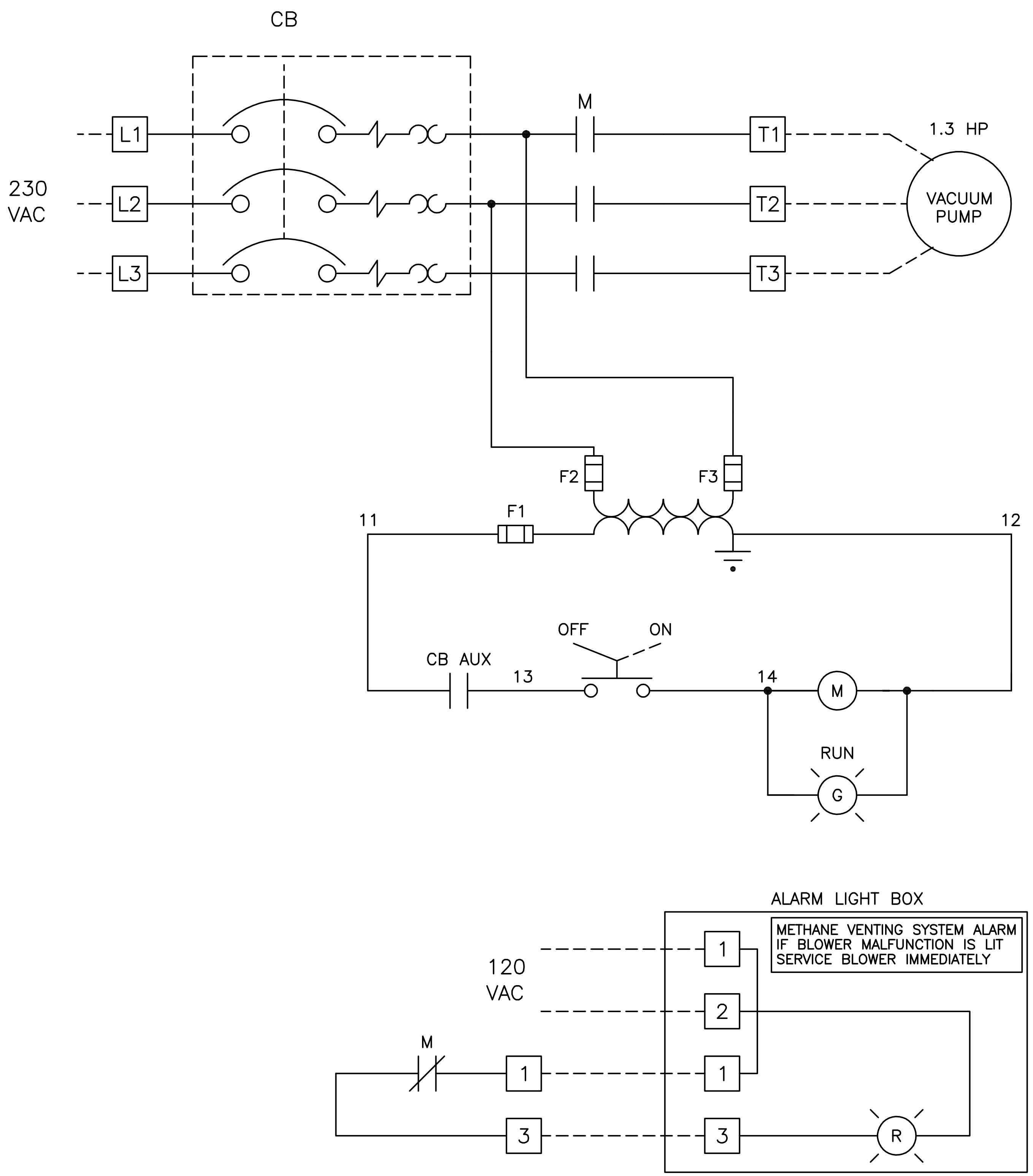
SHEET: 1, 1 SH.

MODEL:

PRODUCT CODE:

? Airtech vacuum Inc 1982

REV.	DESCRIPTION	BY	DATE



NOTES:
1) ALL FIELD WIRING USE COPPER WIRE ONLY, 60 DEG C WIRE INSULATION IF RATED LESS THAN 100 AMP, 75 DEG C WIRE INSULATION IF RATED 100 AMP OR MORE
2) 15 IN-LB RECOMMENDED TORQUE FOR FIELD CONNECTIONS

JOB #1928A
PRGM: N/A
SHEET 1 OF 1

TITLE:
AIRTECH INDUSTRIAL
SIMPLEX ELECT SCHEM
DWG: AT-1782A

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DRAWN BY: MS
DATE: 8/18/2020

OM&C
OLSON MOTOR & CONTROL CO
100 OLD CAMPLAIN RD
HILLSBOROUGH, NJ 08844

Monadnock Construction, Inc. RECEIVED 9/14/2021
Project: Greenpoint Landing H1H2, Submittal No: [312116-04] Page 5 of 12

AIRTECH VACUUM®

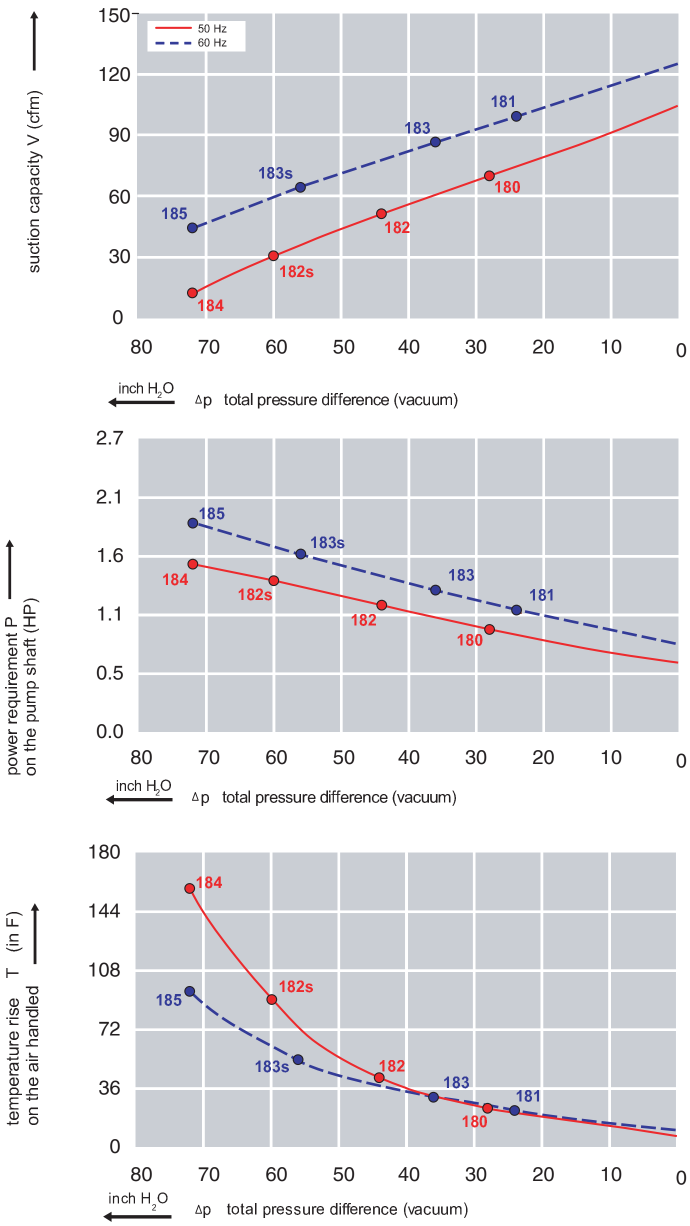
3BA1430

Vacuum/Pressure Regenerative Blower

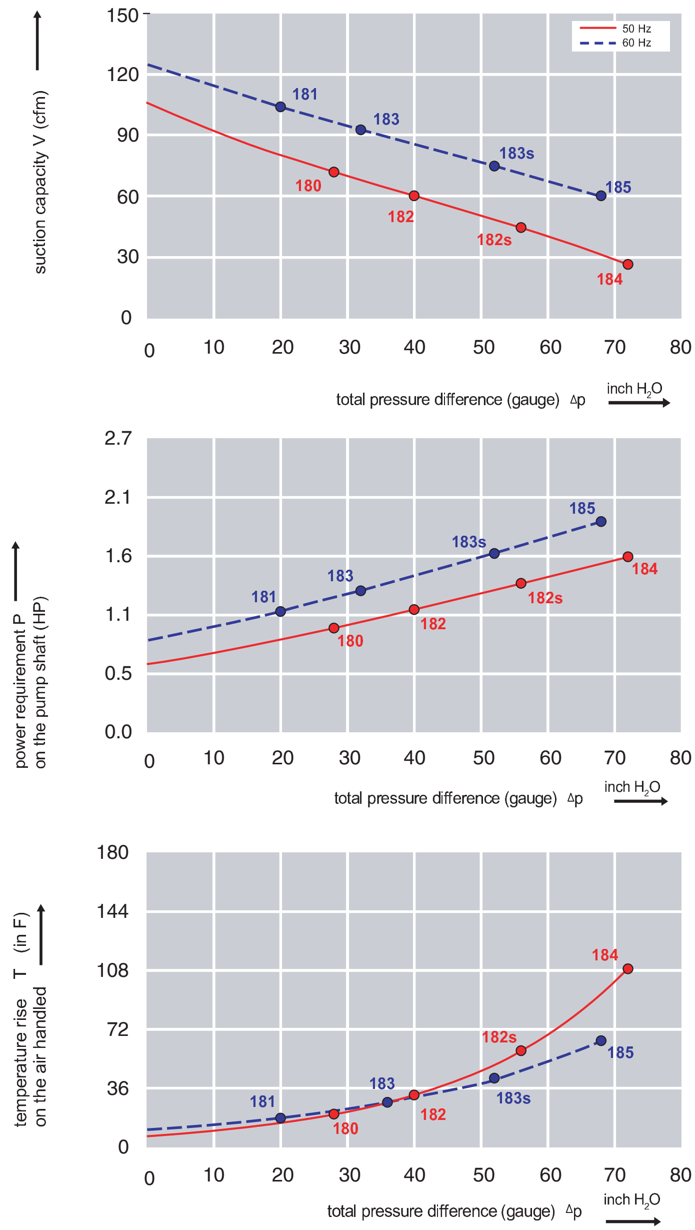
Features:

- Cooler running, outboard bearing provides maintenance-free operation
- Environmentally friendly oil-free technology
- Extremely quiet operation
- All motors are standard TEFC with Class F insulation, UL recognized, CE Compliant
  Explosion-Proof motors available
- Custom construction blowers are available
- Rugged die cast aluminum construction

Performance curve for Vacuum pump



Performance curve for Compressor



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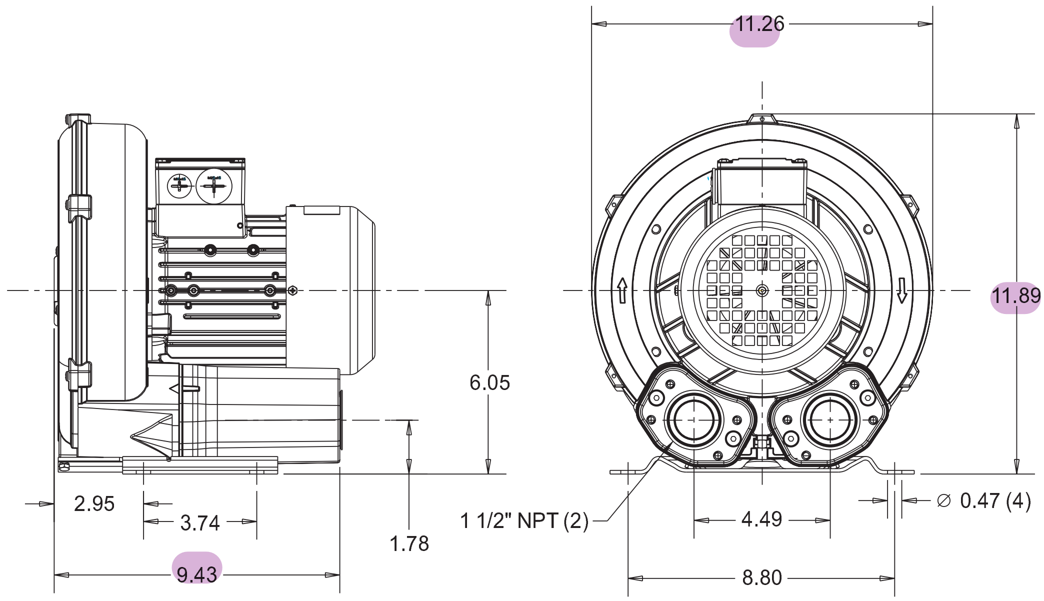
Project: Greenpoint Landing H1H2, Submittal No: [312116-04] Page 6 of 12

AIRTECH® VACUUM

3BA1430

Vacuum/Pressure Regenerative Blower

Dimensions: (inches)



Recommended Accessories:

Relief valve:

VC51Z (Vacuum)

PC51Z (Pressure)

Filter:

ATF-150-1337 (Vacuum)

AFS-20-150-10 (Pressure)

Specifications subject to change without notice. Please contact factory for specification updates.

Selection & Ordering Data - Type 3BA1430

Curve No.	Order No.	Frequency Hz	Rated power HP	Input voltage V		Input current A		Permissible total differential pressure Vacuum inch H2O	Compressor inch H2O	Sound pressure level dB(A)	Weight lbs
3~ 50/60 Hz IP55 insulation material class F											
A 180	3BA1430-7AT06	50	0.93	200D ... 240D	345Y ... 415Y	3.8 D	2.2 Y	-28	28	64	30
A 181	3BA1430-7AT06	60	1.11	220D ... 275D	380Y ... 480Y	3.75D	2.15Y	-24	20	65	30
A 182	3BA1430-7AT16	50	1.13	200D ... 240D	345Y ... 415Y	4.2 D	2.4 Y	-44	40	64	35
A 183	3BA1430-7AT16	60	1.27	220D ... 275D	380Y ... 480Y	4.0 D	2.3 Y	-36	32	65	35
A 184	3BA1430-7AT26	50	1.74	200D ... 240D	345Y ... 415Y	5.7 D	3.3 Y	-72	72	64	37
A 185	3BA1430-7AT26	60	2.01	220D ... 275D	380Y ... 480Y	5.7 D	3.3 Y	-72	68	65	37
1~ 50/60 Hz IP55 with capacitor for continuous operation											
A 182s	3BA1430-7AS24	50	1.47	100/200		16.8	8.4	-60	56	63	35
A 183s	3BA1430-7AS24	60	1.74	100/200		17.2	8.6	-56	52	64	35
A 182s	3BA1430-7AS25	50	1.47	115/230		13.0	6.5	-60	56	63	37
A 183s	3BA1430-7AS25	60	1.74	115/230		14.0	7.0	-56	52	64	37

Suitable for 208 Volt Operation

All curves are rated at 14.7 psia and 68° F ambient conditions and are reported in SCFM referenced to 68° F and 14.696 psia sea level conditions. Curve values are nominal, actual performance may vary by up to 10% of the values indicated. For inlet temperatures above approximately 80 ºF or for handling gases other than air, please contact your Airtech sales representative for assistance.

Monadnock Construction, Inc. RECEIVED 9/14/2021
Project: Greenpoint Landing H1H2, Submittal No. [312116-04] Page 7 of 12

EQUIPMENT DATA

INNOVATION | DESIGN | SOLUTION
AIRTECH GROUP
AN ISO 9001:2015 CERTIFIED COMPANY

301 Veterans Blvd.
Rutherford, NJ 07070

PROJECT **HIH2 GREENPOINT LANDING**

CUSTOMER **ICONIC MECHANICAL SERVICES CORP**

SUB-SLAB VAPOR EXTRACTION SYSTEM

SIMPLEX, BASE MTD. PACKAGE

MODEL	**1-VE-3BA1430-1.3**
PUMP MOD.	**3BA1430-7AT16**
CAPACITY (EACH)	**86** CFM @ **24" H20**
DRIVE TYPE	**DIRECT**
OPERATING SPEED	**3450** RPM
COMPLETE WITH	**INLET MUFFLER**

DISCHARGE MUFFLER, RELIEF VALVE
INLET FILTER W/WIRE MESH ELEMENT
AIR DILUTION VALVE W/SCREEN
SOUND ENCLOSURE

MOTOR

MOTOR HORSEPOWER	**1.3**
VOLTAGE	**3-60-230V**
RPM	**3600**
ENCLOSURE	**TEFC**

CONTROL PANEL

STARTER PANEL - NEMA	**4/12**
MOUNTING	**BASE**
STARTER TYPE	**FULL VOLTAGE**
DISCONNECT	**----**
CONTROL	**ON/OFF**

ACCESSORIES: **MOTOR RUN LIGHT**
115V CONTROL CIRCUIT TRANSFORMER
AUXILLIARY CONTACT FOR REMOTE ALARM

RELIEF VALVE SET @ **2.5** ("HG)

SEPARATOR / TANK

VOLUME	GALL'S.
STYLE	
RATED VACUUM	
FINISH	

REMOTE ALARM PANEL

NEMA	**12**
MOUNTING	**REMOTE-WALL**
VOLTAGE	**1-60-115**
ALARM	**RED LIGHT**

MISCELLANEOUS:

SUPPLIED LOOSE FOR FIELD INSTALLATION:
(1) SET OF FLEX CONNECTORS

JOB NO. **1928B** DATE **09/03/21**

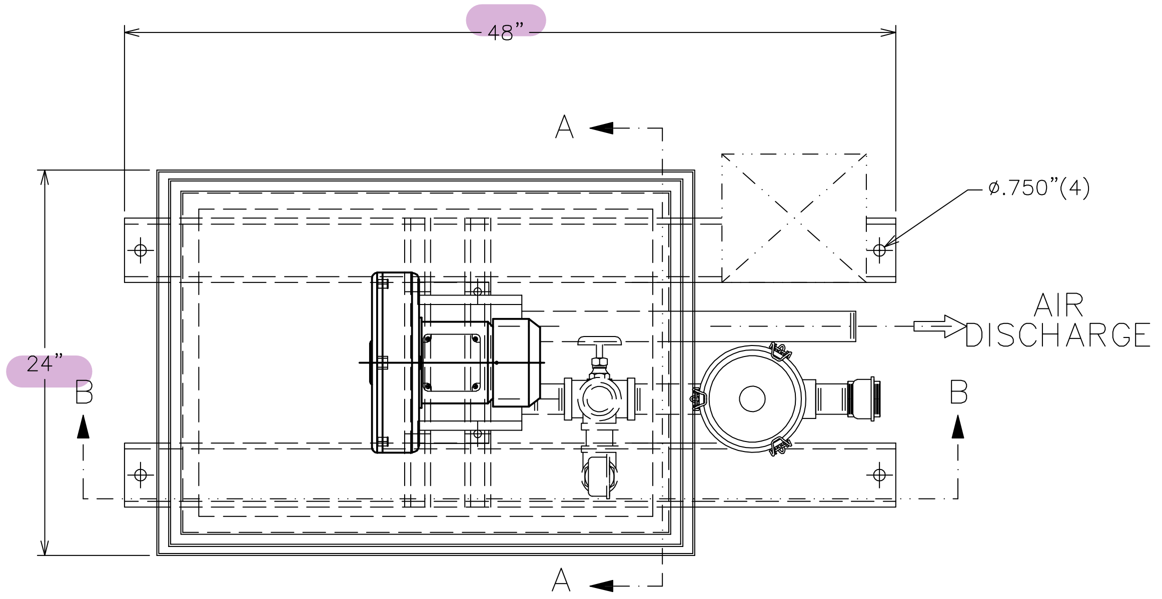
SUBMITTED BY: **K.V.** **SN1**

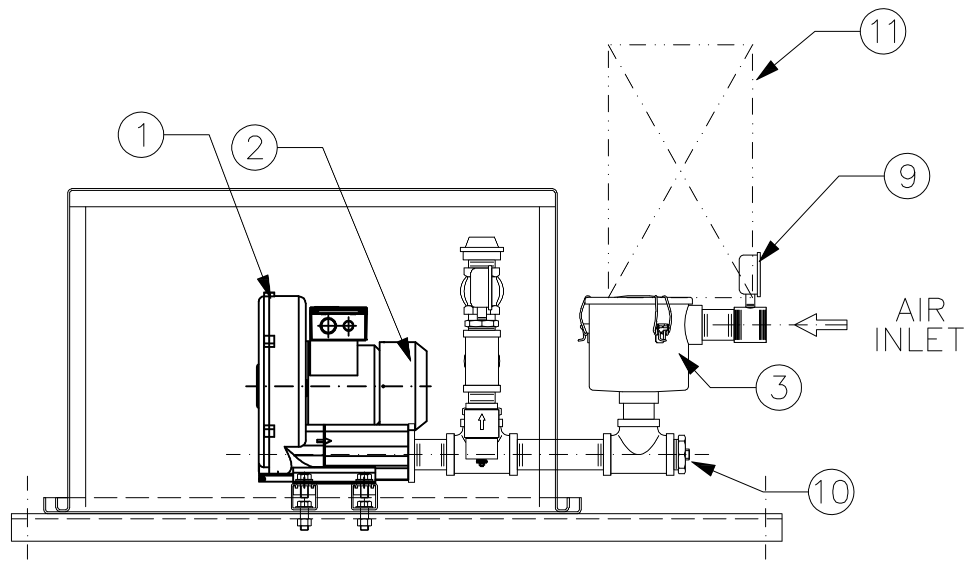
VDA1928B 1-VE-3BA1430-1.3.xls

Monadnock Construction, Inc. RECEIVED 9/14/2021
Project: Greenpoint Landing H1H2, Submittal No: [312116-04] Page 8 of 12

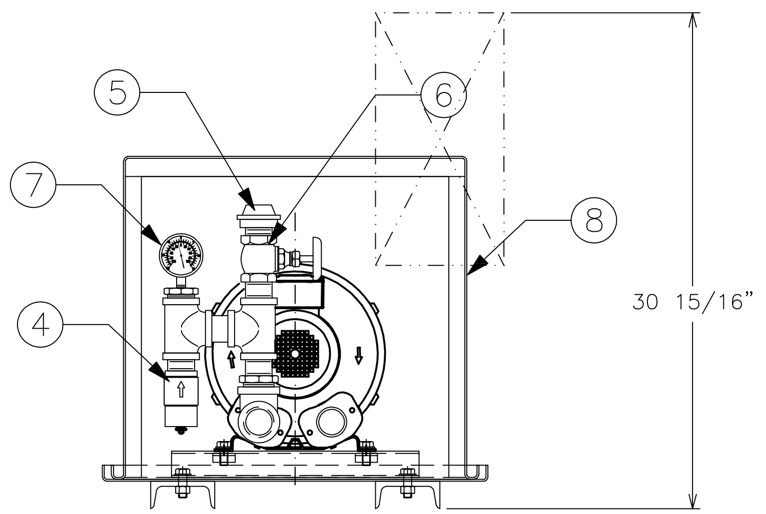
PRODUCTION REVISIONS				
REVISION	DESCRIPTION	DATE	ENG.	APPR.

ITEM	REQ'D	DESCRIPTION	SIZE	PART NO.
1	1	VACUUM BLOWER	1-1/2"	3BA1430-7AT16
2	1	MOTOR	1.3HP	TEFC
3	1	INLET FILTER (WIRE MESH)	1-1/2"	ATF-150-1337
4	1	RELIEF VALVE	1-1/4"	VC51Z-2.5"Hg
5	1	INLET STAINER	1-1/4"	
6	1	AIR BLEED VALVE	1-1/4"	GLOBE
7	1	VACUUM GAUGE	2-1/2"	0-100" WC
8	1	SOUND ENCLOSURE		SD-4
9	1	VACUUM GAUGE	2-1/2"	0-100" WC
10	1	TEST PORT PLUG	1/2"	
11	1	CONTROL PANEL		
A	1	AIR INLET	1-1/2"	
B	1	AIR DISCHARGE	1-1/2"	





SECTION B-B



SECTION A-A

NOTE:
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SURFACE FINISH ACC. TO ISO 1302

DIMENSIONS W/O TOLERANCES ACC. TO ISO 2768 - mH

SCALE: NTS

WEIGHT: APPROX. 275 LBS

MATERIAL: 1-VE-3BA1430-1.3

	DATE	ENG.
DRAWN	9-3-2021	K.V.
CHECKED	9-3-2021	A.N.
		A3

#	DESCRIPTION	DATE	ENG.	APPR.
0	DRAWING CREATED	9-3-2021	K.V.	A.N.

DESCRIPTION:

VACUUM BLOWER PACKAGE
BLOWER B

INNOVATION | DESIGN | SOLUTION
AIRTECH
AN ISO 9001:2015 CERTIFIED COMPANY GROUP
301 Veterans Blvd, Rutherford NJ 07070
Tel:201-569-1173 | Fax:201-569-1696
www.airtechusa.com

DRW-File: 1928B-1

SHEET 1 / 1 SH.

MODEL:

PRODUCT CODE:

? Airtech vacuum Inc 1982

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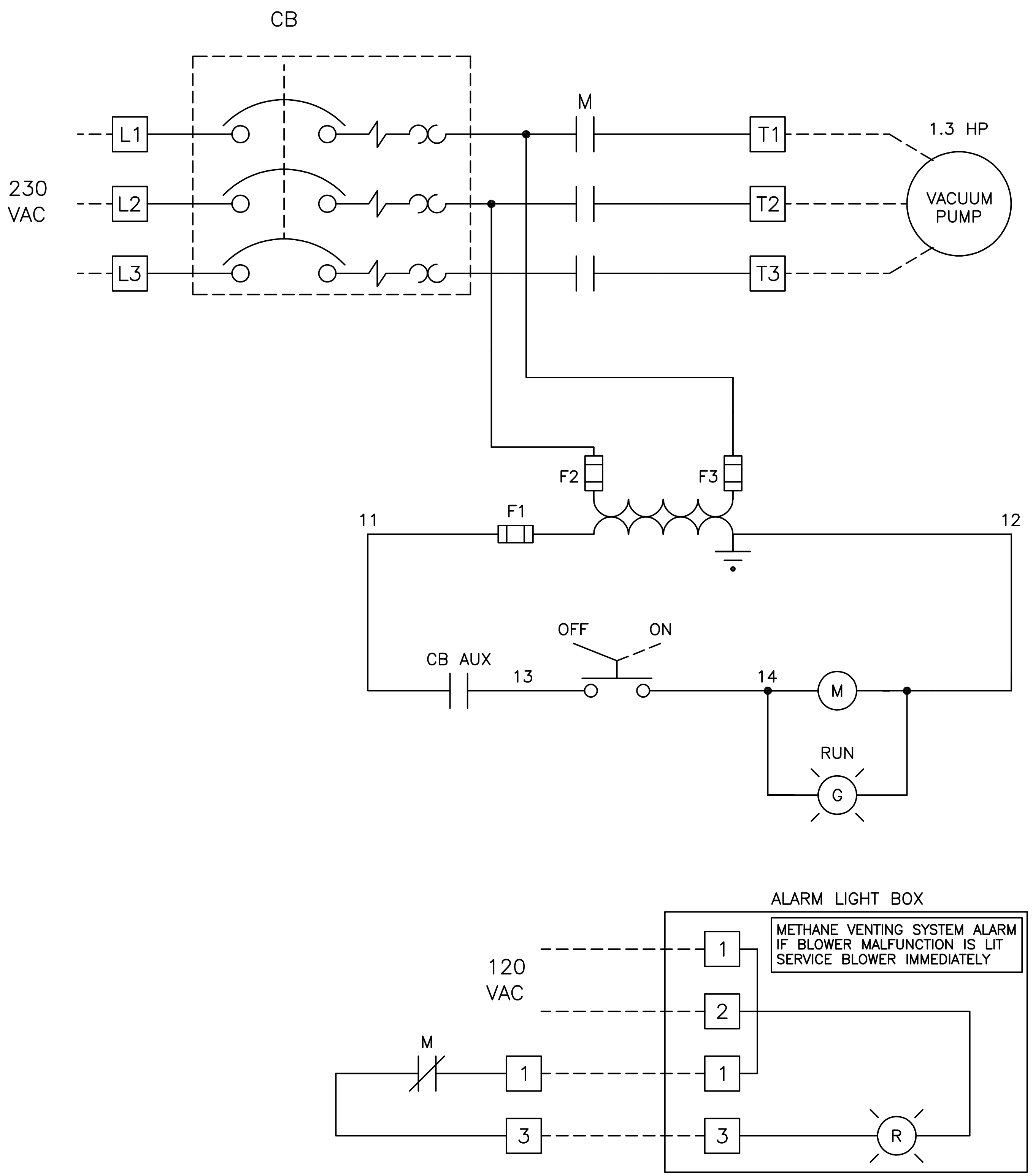
REV.	DESCRIPTION	BY	DATE



NOTES:
1) ALL FIELD WIRING USE COPPER WIRE ONLY, 60 DEG C WIRE INSULATION IF RATED LESS THAN 100 AMP, 75 DEG C WIRE INSULATION IF RATED 100 AMP OR MORE
2) 15 IN-LB RECOMMENDED TORQUE FOR FIELD CONNECTIONS

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PRGM: N/A		DRAWN BY: MS	
SHEET 1 OF 1	DWG: AT-1782A	DATE: 8/18/2020	

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AIRTECH VACUUM

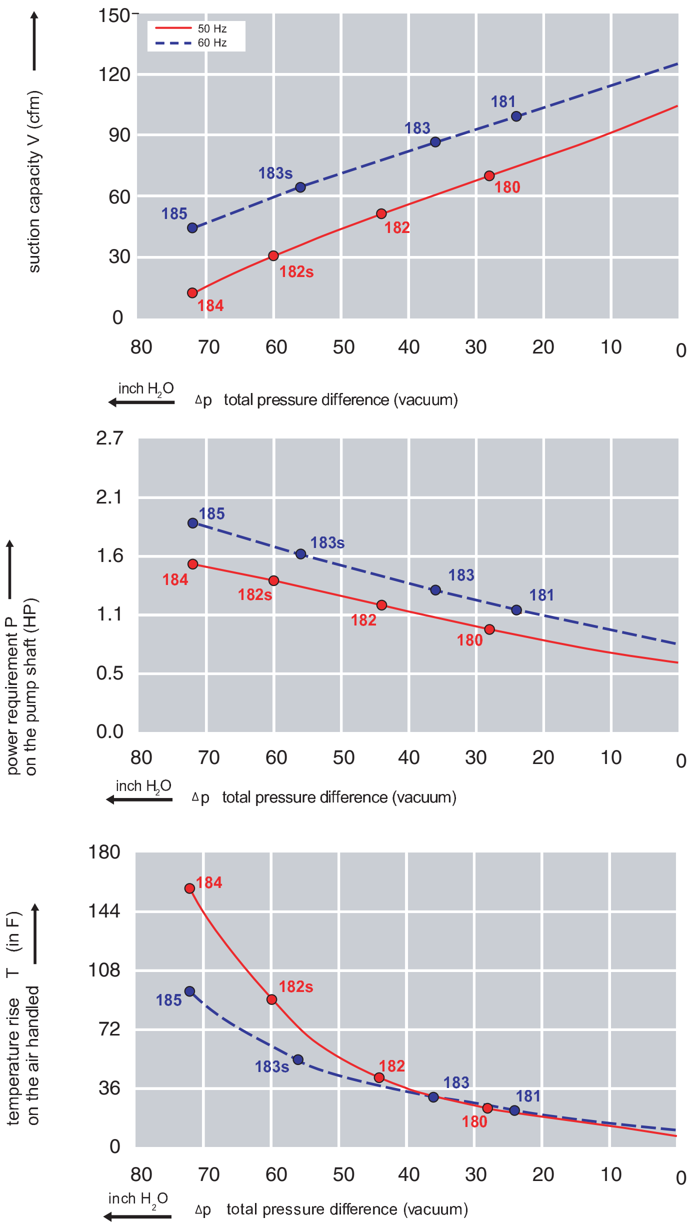
3BA1430

Vacuum/Pressure Regenerative Blower

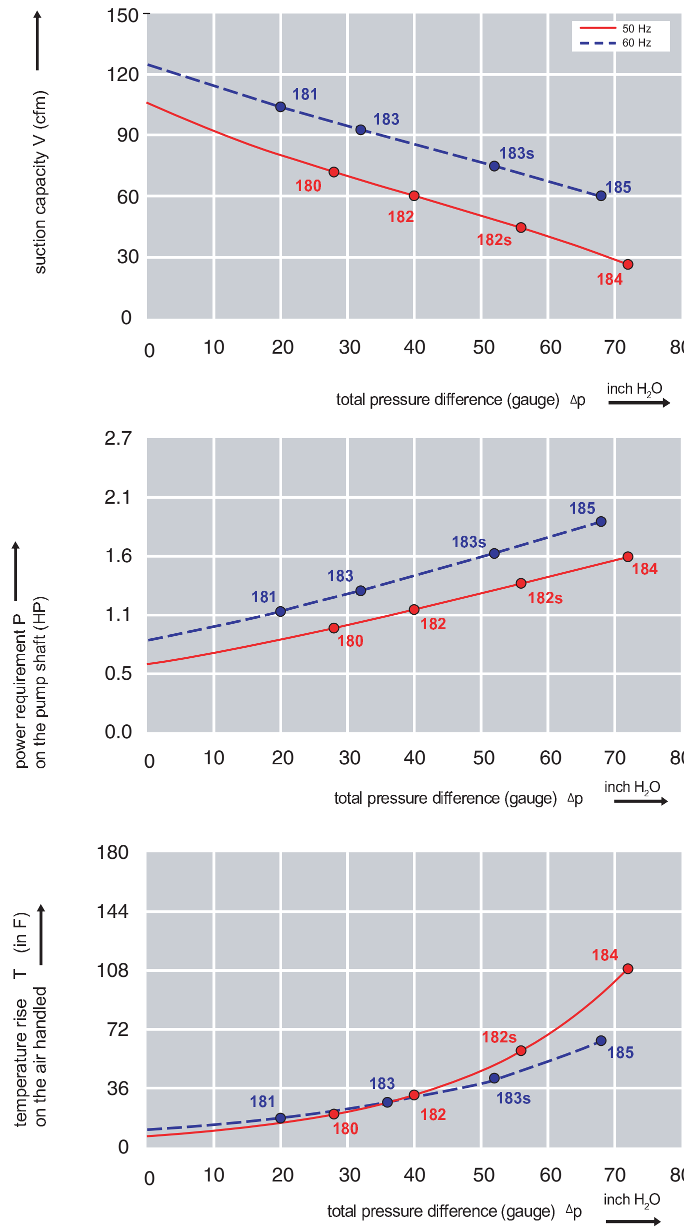
Features:

- Cooler running, outboard bearing provides maintenance-free operation
- Environmentally friendly oil-free technology
- Extremely quiet operation
- All motors are standard TEFC with Class F insulation, UL recognized, CE Compliant
  Explosion-Proof motors available
- Custom construction blowers are available
- Rugged die cast aluminum construction

Performance curve for Vacuum pump



Performance curve for Compressor



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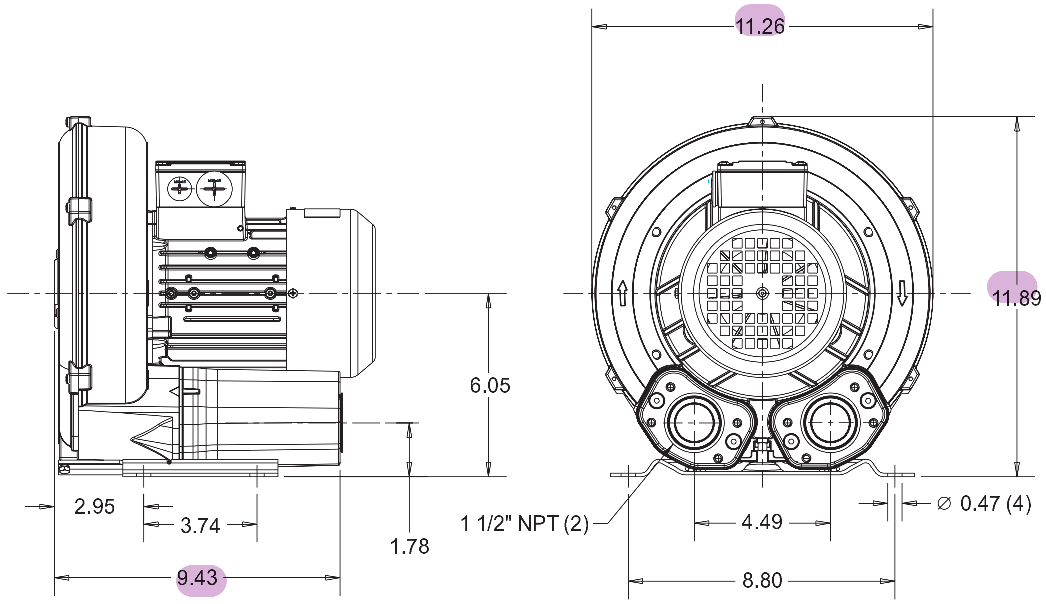
Project: Greenpoint Landing H1H2, Submittal No: [312116-04] Page 11 of 12

AIRTECH® VACUUM

3BA1430

Vacuum/Pressure Regenerative Blower

Dimensions: (inches)



Recommended Accessories:

Relief valve:

VC51Z (Vacuum)

PC51Z (Pressure)

Filter:

ATF-150-1337 (Vacuum)

AFS-20-150-10 (Pressure)

Specifications subject to change without notice. Please contact factory for specification updates.

Selection & Ordering Data - Type 3BA1430

Curve No.	Order No.	Fre-quency Hz	Rated power HP	Input voltage V		Input current A		Permissible total differential pressure Vacuum inch H2O	Compressor inch H2O	Sound pressure level dB(A)	Weight lbs
3~ 50/60 Hz IP55 insulation material class F											
A 180	3BA1430-7AT06	50	0.93	200D ... 240D	345Y ... 415Y	3.8 D	2.2 Y	-28	28	64	30
A 181	3BA1430-7AT06	60	1.11	220D ... 275D	380Y ... 480Y	3.75D	2.15Y	-24	20	65	30
A 182	3BA1430-7AT16	50	1.13	200D ... 240D	345Y ... 415Y	4.2 D	2.4 Y	-44	40	64	35
A 183	3BA1430-7AT16	60	1.27	220D ... 275D	380Y ... 480Y	4.0 D	2.3 Y	-36	32	65	35
A 184	3BA1430-7AT26	50	1.74	200D ... 240D	345Y ... 415Y	5.7 D	3.3 Y	-72	72	64	37
A 185	3BA1430-7AT26	60	2.01	220D ... 275D	380Y ... 480Y	5.7 D	3.3 Y	-72	68	65	37
1~ 50/60 Hz IP55 with capacitor for continuous operation											
A 182s	3BA1430-7AS24	50	1.47	100/200		16.8	8.4	-60	56	63	35
A 183s	3BA1430-7AS24	60	1.74	100/200		17.2	8.6	-56	52	64	35
A 182s	3BA1430-7AS25	50	1.47	115/230		13.0	6.5	-60	56	63	37
A 183s	3BA1430-7AS25	60	1.74	115/230		14.0	7.0	-56	52	64	37

Suitable for 208 Volt Operation

All curves are rated at 14.7 psia and 68° F ambient conditions and are reported in SCFM referenced to 68° F and 14.696 psia sea level conditions. Curve values are nominal, actual performance may vary by up to 10% of the values indicated. For inlet temperatures above approximately 80 °F or for handling gases other than air, please contact your Airtech sales representative for assistance.

Monadnock Construction, Inc. RECEIVED 9/14/2021
Project: Greenpoint Landing H1H2, Submittal No. [312116-04] - Page 12 of 12

APPENDIX I

REMEDIAL SITE OPTIMIZATION REPORT

REMEDIAL SITE OPTIMIZATION REPORT

TABLE OF CONTENTS