REMEDIAL ACTION WORK PLAN

for

12096 FLATLANDS AVENUE
Brooklyn, New York
NYSDEC BCP Site No. C224290

Prepared For:

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Revised 19 June 2023

Langan Project No. 100688801

CERTIFICATION

I, Ronald D. Boyer, certify that I am currently a Professional Engineer as defined in 6 NYCRR Part 375 and that this Remedial Action Work Plan (RAWP) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (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 Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

NYS Professional Engineer	Date	Signature

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

Acronym	Definition
AOC	Area of Concern
AST	Aboveground Storage Tank
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below Ground Surface
BOA	Brownfield Opportunity Area
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylene
C/D	Construction/Demolition
CAMP	Community Air Monitoring Program
CCR	Construction Completion Report
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
CQAP	Construction Quality Assurance Plan
COC	Contaminants of Concern
COD	Chemical Oxygen Demand
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DMM	Division of Materials Management
DO	Dissolved Oxygen
DOT	Department of Transportation
EC	Engineering Control
el	Elevation
ELAP	Environmental Laboratory Approval Program
EPA	United States Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
eV	Electron Volt
FEMA	Federal Emergency Management Agency
FER	Final Engineering Report
FWRIA	Fish and Wildlife Resources Impact Analysis

Acronym	Definition
GPR	Ground Penetrating Radar
IC	Institutional Control
IRMWP	Interim Remedial Measures Work Plan
ISCO	In-Situ Chemical Oxidation
µg/L	Microgram Per Liter
$\mu g/m^3$	Microgram Per Cubic Meter
mg/kg	Milligram Per Kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTBE	Methyl tert Butyl Ether
NAVD88	North American Vertical Datum of 1988
NYCRR	New York Codes, Rules and Regulations
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings
NYCOER	New York City Office of Environmental Remediation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	Oxidation-Reduction Potential
OSHA	United States Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PBS	Petroleum Bulk Storage
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PG	Protection of Groundwater
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	Parts per million
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
RCRA	Resource Conservation and Recovery Act
RE	Remediation Engineer
REC	Recognized Environmental Condition

Acronym	Definition
RI	Remedial Investigation
RIR	Remedial Investigation Report
RURR	Restricted Use – Restricted Residential
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objective
SMDS	Sub-Membrane Depressurization System
SMMP	Soil/Materials Management Plan
SMP	Site Management Plan
STARS	Spills Technology and Remediation Series
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TOGS	Technical and Operational Guidance Series
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This Remedial Action Work Plan (RAWP) was prepared on behalf of Innovative Urban Living, LLC (Volunteer), for the proposed development located at 12096 Flatlands Avenue (Block 4434, Lot 10) in the East New York neighborhood of Brooklyn, New York (the Site). The Volunteer has enrolled in the New York State Brownfield Cleanup Program (BCP) as a Volunteer and will implement this RAWP pursuant to the Brownfield Cleanup Agreement (BCA) executed on 31 May 2019 with the New York State Department of Environmental Conservation (NYSDEC).

This RAWP summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI) work completed by Langan, provides evaluations of Track 1 and Track 2 remedies and associated costs, and recommends the preferred remedy. The remedy was selected consistent with the procedures defined in DER-10 and complies with applicable standards, criteria, and guidance, as well as with applicable federal, state and local laws, regulations and requirements.

Site Description/Physical Setting/Site History

The Site is located in the East New York neighborhood of Brooklyn, New York and is identified as Block 4434 Lot 10. The Site is an approximately 68,435-square-foot parcel consisting of a vacant gravel lot used for surplus parking for the adjacent Christian Cultural Center (CCC) building, located to the west of the Site. The Site is bound to the north by Flatlands Avenue (formerly Fairfield Avenue prior to 1967) followed by a gasoline filling station, automotive repair facility, carwash, and Sheffield Avenue. The Site is bound to the east by Pennsylvania Avenue followed by a vacant landscaped lot and the northern courtyard of a 20-story residential building (part of the Starrett City Complex), to the south by a 12-story multi-family residential building, and to the west by the western extents of the gravel lot currently used for surplus parking by the CCC. A

According to the Boundary and Topographic Survey prepared by Control Point Associates Inc. signed 14 October 2021, Site elevations vary between approximately +11.43 feet and +24.45 feet North American Vertical Datum of 1988 (NAVD88) and slopes towards Flatlands Avenue.

Summary of the Remedial Investigation Findings

The findings summarized herein are based on field observations and instrument readings and laboratory analytical results of soil, groundwater, and soil vapor samples collected during the 2018 Phase II Environmental Investigation (EI), 2021 Remedial Investigation (RI), and 2023 Supplemental Remedial Investigation (SRI). Findings and conclusions are as follows:

1. Stratigraphy: A fill layer as deep as 30 feet is generally underlain by a native sand layer. Bedrock was not encountered in any of the soil borings advanced during the 2018 Phase II EI or the 2021 RI.
2. Hydrogeology: Groundwater was encountered between el 2.04 and el 2.60 feet NAVD88 (between 12.13 and 17.44 feet below ground surface) during the RI. Based on area topography, observed water level measurements, and the proximity of the Site to Fresh Creek, groundwater flow is to the south toward Fresh Creek and Jamaica Bay.
3. Fill Quality: Up to 30 feet of fill material was identified below ground surface. Contaminants identified within the fill material include SVOCs, metals, pesticides, PCBs, and PFAS (PFOA and PFOS) which were detected at concentrations above Unrestricted Use SCOs, Restricted-Residential RUSCOs, and/or Protection of Groundwater SCOs within this layer. Elevated concentrations of SVOCs, metals, pesticides, PCBs, and PFAS (PFOA and PFOS) in fill material are attributable to fill material imported from the city solid waste incinerator and fill material of unknown origin; detections of SVOCs, metals, and PFAS may also be attributable to historical Site operations for automotive dismantling/wrecking.
4. Groundwater Quality: Elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) and total lead in groundwater are likely attributed to sediment entrainment of fill material in the sample. Elevated concentrations of total and dissolved barium in one groundwater sample collected during the 2021 RI is attributed to sediment entrainment of fill material and isolated impacts related to the presence of fill. Other metals detected in groundwater above the SGVs (total and/or dissolved iron, manganese, and sodium) are attributed to naturally occurring background concentrations. The presence of PFOA and PFOS in groundwater may be attributable to the presence of fill material, as well as the historical Site operations as an automotive dismantling/wrecking facility.
5. Soil Vapor Quality: Results of the soil vapor sampling identified concentrations of cis-1,2 DCE and vinyl chloride above the monitoring and/or mitigation guidance values per the NYSDOH Soil Vapor Intrusion Matrix guidance values at one of the seven sample locations. Low levels of petroleum-related VOCs were also identified in this sample and across the Site footprint. Petroleum-related VOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the site, but concentrations in soil vapor may be attributable to releases associated with historical Site operations. As CVOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the site, the presence of elevated

concentrations of these compounds in one soil vapor sample is attributed to an isolated unknown source. Methane was historically detected in the subsurface circa 1991; however, methane was not detected in the subsurface at the Site or surrounding parcels during the Phase II EI.

Qualitative Human Health Exposure Assessment

1. Under current conditions, there is a marginal risk for exposure only if there is a breach of the gravel layer. The primary exposure pathways are for dermal contact, ingestion and inhalation of soil or soil vapor by authorized site personnel in instances where the integrity of the gravel layer is compromised or during site investigation. Exposure to groundwater is limited to those completing investigation activities. The exposure risks can be avoided or minimized by limiting Site access and implementing the appropriate health and safety and vapor and dust suppression measures outlined in a Site-specific HASP and CAMP during ground-intrusive activities.
2. In the absence of protective measures, there is a moderate risk of exposure during the construction and remediation activities. The primary exposure pathways are:
   a. Dermal contact, ingestion and inhalation of contaminated soil, groundwater, or soil vapor by Site visitors and construction and remediation workers.
   b. Dermal contact, ingestion and inhalation of soil (dust) and inhalation of soil vapor by the community in the vicinity of the Site.

   These exposure pathways can be avoided or minimized by performing community air monitoring and by following the appropriate health and safety plans, implementing vapor and dust suppression techniques, and using Site security to control access.
3. A complete exposure pathway is possible for the migration of Site contaminants to off-Site human receptors during the remedial construction phase. During this phase, Site access will be limited to authorized personnel and workers and protective measures will be used during construction to prevent completion of this pathway, including following a Site-specific HASP and implementation of a CAMP.
4. The existence of a complete exposure pathway for Site contaminants to human receptors during proposed future conditions is unlikely, as on-Site sources of contamination will be excavated and transported for off-Site disposal. Regional groundwater is not used as a potable water source in this part of New York City.

Summary of the Remedy

Alternative I, a Track 1 Unrestricted Use cleanup utilizing the NYSDEC Unrestricted Use SCOs, will include the following tasks:

- Development and implementation of a CHASP and CAMP for the protection of on-Site workers, community/residents, and the environment during remediation and construction activities.
- Construction of the support of excavation (SOE) system to facilitate the Track 1 remediation.
- Dewatering in compliance with city, state, and federal laws and regulations. Extracted groundwater will be managed under a permit from NYCDEP/NYSDEC that will be required to meet effluent limitations prior to discharge to the sewer system.
- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations.
- Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work.
- Excavation, stockpiling, off-Site transport, and disposal of soil that exceeds Unrestricted Use SCOs as defined by 6 NYCRR Part 375-6.8, and as needed for the remediation as follows:
    - The entire Site footprint will be excavated from ground surface to between 15 and 20 feet bgs to remove known elevated concentrations of SVOCs, metals, PCBs, and pesticides exceeding the Unrestricted Use SCOs at various locations throughout the Site footprint.
        - Approximately 18,550 square feet (approximately 27% of the Site footprint) will be excavated to 15 feet below existing grade.
        - Approximately 22,850 square feet (approximately 33% of the Site footprint) will be excavated to 16 feet below existing grade.
        - Approximately 27,075 square feet (approximately 40% of the Site footprint) will be excavated to 20 feet below existing grade.
    - Additional 15- by 15-foot hotpot excavations to remove elevated concentrations of metals, PCBs, and pesticides above the Unrestricted Use SCOs will be completed throughout the site footprint as follows:

- One hotspot centered on LSB-22 will be excavated from the base of the 15-foot mass remedial excavation to approximately 16 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
- One hotspot centered on LSB-20 will be excavated from the base of the 16-foot mass remedial excavation to approximately 18 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
- One hotspot centered on LSB-18 will be excavated from the base of the 16-foot mass remedial excavation to approximately 19.5 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
- One hotspot centered on LSB-19 will be excavated from the base of the 20-foot mass remedial excavation to approximately 21 feet bgs for the remediation of metals and PCBs at concentrations above the Unrestricted Use SCOs.
- One hotspot centered on LSB-16 will be excavated from the base of the 20-foot mass remedial excavation to approximately 22.5 feet bgs for the remediation of metals and PCBs at concentrations above the Unrestricted Use SCOs.
- One hotspot centered on LSB-26 will be excavated from the base of the 20-foot mass remedial excavation to approximately 23.5 feet bgs for the remediation of metals and pesticides at concentrations above the Unrestricted Use SCOs.

- Appropriate off-Site disposal of material removed from the Site in accordance with federal, state and local rules and regulations for handling, transport, and disposal.
- Removal and decommissioning of any encountered USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and disposal off-Site during Site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.

- Collection and analysis of confirmation soil samples from the excavation base, in accordance with DER-10 to confirm Track 1 SCOs were achieved; over-excavation may be completed if feasible to meet the Unrestricted Use SCOs.
- Importation and backfilling of remediated areas, as necessary for development, with certified-clean material (meeting Track 1 SCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone to backfill areas excavated deeper than the development depth.
- Installation of a vapor barrier/waterproofing membrane below the slab of the proposed building and along sidewalls of any subgrade foundation elements beneath occupied spaces as a green remediation component.
- All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) was prepared on behalf of the Volunteer for the approximate 1.572-acre property located at 12096 Flatlands Avenue (Block 4434, Lot 10) in the East New York neighborhood of Brooklyn, New York (the Site). The Volunteer is participating in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a Volunteer as defined in ECL 27-1405 (1)(b) and as identified in the executed Brownfield Cleanup Agreement dated 31 May 2019. The Site is identified in the BCP as Site No. C224290.

This RAWP summarizes the nature and extent of contamination as determined from data gathered during the Phase II Environmental Investigation work completed by Langan in 2018 and documented in an August 2018 Phase II Environmental Investigation Report (2018 Phase II EI), the Remedial Investigation completed by Langan in 2021 and documented in the January 2022 Remedial Investigation Report (2022 RIR), and the Supplemental Remedial Investigation completed by Langan in 2023 and documented in the June 2023 Draft Supplemental Remedial Investigation Report (2023 SRIR). The selected remedy is consistent with the procedures defined in DER-10/Technical Guidance for Site Investigation and Remediation and complies with applicable standards, criteria, and guidance, and with applicable federal, state and local laws, regulations and requirements.

1.1 Site Location and Description

The Site is located in the East New York neighborhood of Brooklyn, New York and is identified as Block 4434 Lot 10. The Site is an approximately 68,435-square-foot parcel consisting of a vacant gravel lot used for surplus parking for the adjacent Christian Cultural Center (CCC) building, located to the west of the Site. The Site is bound to the north by Flatlands Avenue (formerly Fairfield Avenue prior to 1967) followed by a gasoline filling station, automotive repair facility, carwash, and Sheffield Avenue. The Site is bound to the east by Pennsylvania Avenue followed by a vacant landscaped lot and the northern courtyard of a 20-story residential building (part of the Starrett City Complex), to the south by a 12-story multi-family residential building, and to the west by the western extents of the gravel lot currently used for surplus parking by the CCC. A Site location map and Site Plan/AOC Plan and Sample Location Plan are provided as Figures 1 and 2, respectively. A Site survey is provided as Appendix A.

According to the Boundary and Topographic Survey prepared by Control Point Associates Inc. signed 14 October 2021, Site elevations vary between approximately +11.43 feet and +24.45 feet North American Vertical Datum of 1988 (NAVD88) and slopes towards Flatlands Avenue.

1.2 Redevelopment Plan

The proposed future use of the Site consists of construction of two mixed-use commercial/residential buildings in the central and eastern portion of the Site with a single cellar level across the majority of the Site footprint. A private roadway will be constructed at street level on the western portion of the Site.

The residential portions of the buildings will be comprised of 100% income-based affordable housing, while the commercial portions will be used for a neighborhood community facility and/or retail space. The cellar will consist of below grade parking, mechanical rooms housing utilities, compactors, and telecom equipment, a laundry room, offices for building maintenance and management, and bicycle and miscellaneous storage. An electrical vault and stormwater detention tanks are proposed in the northwestern portion of the Site, outside of the cellar footprint and beneath the future roadway.

The proposed development plans are included as Appendix B.

1.3 Description of Surrounding Properties

According to records maintained online by New York City Open Accessible Space Information System (NYC OASIS) and aerial/street-view observations provided by Google Maps, surrounding properties include commercial, industrial, and automotive uses to the north, residential properties to the east and south, and parking lots and the CCC building to the west. The following is a summary of adjacent property usage:

Direction	Adjacent Properties			Surrounding Properties
	Block No.	Lot No.	Description	
North	4412	29 & 31	Flatlands Avenue followed by a car wash and automotive repair business and gasoline filling station	Industrial / manufacturing and commercial buildings and a gasoline filling station

Direction	Adjacent Properties			Surrounding Properties
	Block No.	Lot No.	Description	
East	4435	1 & 100	Pennsylvania Avenue followed by a vacant landscaped lot and the northern courtyard of a twenty-story residential building (part of the Starrett City Complex)	Residential building complex
South	4434	60	A twelve-story multi-family residential building	Residential building complexes
West	4434	1	Western extents of the gravel lot currently used for surplus parking by the CCC	CCC building, commercial buildings, Fresh Creek Nature Preserve

Public infrastructure (storm drains, sewers, and underground utility lines) exists within the street to the north the Site. The only sensitive receptors (as defined in DER-10) located within a half mile of the Site include:

Number	Name (Approximate distance from site)	Address
1	Brooklyn Public Library After School Program, Spring Creek Branch (approximately 650 feet northeast of the site)	12143 Flatlands Avenue Brooklyn, NY 11207
2	PS 306 Ethan Allen (approximately 1,300 feet northeast of the site)	970 Vermont Street Brooklyn, NY 11207
3	Starrett City Early Learning Center (approximately 1,500 feet southeast of the site)	1325 Pennsylvania Avenue Brooklyn, NY 11239
4	Penn-Wortman Community Center After School Program (approximately 1,700 feet north of the site)	895 Pennsylvania Avenue Brooklyn, NY 11207

Number	Name (Approximate distance from site)	Address
5	Charisma Christian Academy daycare (approximately 1,900 feet west of the site)	921 East 107th Street Brooklyn, NY 11236
6	Yeshiva R'tzahd School Annex daycare (approximately 2,000 feet west of the site)	8700 Avenue K Brooklyn, NY 11236
7	PS 260 Breuckelen (approximately 2,100 feet west of the site)	875 Williams Avenue Brooklyn, NY 11207

1.4 Site History

1.4.1 Past Uses and Ownership

According to Langan's review of previous environmental assessments and investigation reports prepared for the Site, as discussed below in Section 1.4.2, historical Site use and features include a former gasoline filling station, former operations for automotive dismantling/wrecking, and historical filling during the early 1900's using ash and residue from a city solid waste incinerator.

Historical uses of adjacent and nearby properties include gasoline filling stations and automotive repair to the north between 1950 and 2007 and automotive junk yards adjacent to the west from 1967 through 2001.

1.4.2 Previous Environmental Reports

The following environmental assessment and investigation reports have been prepared for the Site, which are provided in Appendix C.

- *Fresh Creek Estates, Technical Memorandum to the Draft Environmental Impact Statement (DEIS),* prepared by AKRF, Inc., dated June 1991;
- *Subsurface Investigation and Report,* prepared by Soil Engineering Services, Inc. (SESI), dated March 1994;
- *Phase I Environmental Site Assessment (ESA),* prepared by Soil Mechanics Environmental Services (SMES), dated July 1997; and,
- *Phase I ESA for Flatlands Ave. & Pennsylvania Ave.,* prepared by Soil Mechanics Environmental Services (SMES), dated April 2003.

In addition, Langan prepared the following environmental reports for the Site:

- *Phase II Environmental Investigation Report (EI)* dated 24 August 2018;
- *Phase I ESA* dated 24 August 2018;
- *Remedial Investigation Work Plan* dated 19 May 2020;
- *Remedial Investigation Report* dated 14 January 2022; and,
- *Draft Supplemental Remedial Investigation Report* dated 7 June 2023.

Summaries of environmental findings of these reports are provided below.

<u>Fresh Creek Estates, Technical Memorandum to the Draft Environmental Impact Statement (DEIS) (AKRF 1991)</u>

According to the Technical Memorandum, AKRF, Inc. (AKRF) prepared a comprehensive environmental assessment of the proposed Fresh Creek Estates site, which included the Site and a number of surrounding parcels. The Technical Memorandum identified that the Site was originally marshlands and was landfilled during the early 1900's using ash and residue from a city solid waste incinerator. Prior to 1950, a gasoline filling station was located on the northeast portion of the site at the intersection of Pennsylvania Avenue and Flatlands Avenue, which corresponds to the current extents of the Site. Potential subsurface impacts due to historical site use and historic filling operations were investigated by completion of an electromagnetic survey, test pits, soil borings, and monitoring well installation and collection of soil, soil, and groundwater samples. Based on the sample location plan provided, one test pit, two soil borings, and two groundwater monitoring wells were installed on the Site.

Soil and groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and metals and groundwater samples were analyzed for total dissolved solids, hexavalent chromium, and chloride. Although a soil vapor sample location map was not provided for review, the sampling methodology discussion identified that all 34 soil vapor samples were collected from the former gasoline filling station and were likely located on the Site. The Technical Memorandum concluded that the Site is underlain by unconsolidated fill containing varying amounts of sand, gravel, clay, bricks, organic material, concrete, glass and asphalt. Groundwater was encountered at depths that ranged from 12.67 to 22.82 feet below existing grades. Soil sample analytical results revealed TPH in soil at concentrations ranging from 91 parts-per-million (ppm) to 25,900 ppm over the entire proposed Fresh Creek Estates development site. However, laboratory analytical packages and summary tables were not provided for review; as such, subsurface soil and groundwater impacts identified during the 1991 environmental investigation could not be correlated to the Site.

The AKRF Technical Memorandum was reviewed by Soil Mechanics Environmental Services (SEMS) and a summary of the AKRF Technical Memorandum investigation and findings was included in the SEMS April 2003 Phase I ESA, as discussed below. According to the 2003 Phase I ESA, results of the soil vapor survey did not identify elevated VOCs with the exception of methane, which was presumed to be associated from organic material in fill and/or underlying marsh deposits.

Subsurface Investigation and Report (SESI 1994)

SESI completed a subsurface investigation that included installation of eight soil borings to depths that ranged from 26 to 51.5 feet below existing grade at the entire CCC property for the purposes of evaluating geotechnical conditions and providing recommendations for foundation design and general site development. The report documented that the Site is underlain by a layer of miscellaneous fill of unspecified thickness followed by native medium-dense medium to fine grained sand. As the report provided was not complete and a geotechnical boring location plan was not provided for review, subsurface conditions could not be correlated to the Site.

Phase I Environmental Site Assessment (SMES 1997)

SMES prepared a Phase I ESA on behalf of Legacy General Contracting Corp. with the intent of constructing an approximately 100,000-square foot two-story building, presumably what became the adjacent CCC building. Based on the descriptions of the subject property and adjacent properties in the SMES Phase I ESA report, it appears that this Phase I ESA was not completed for the Site.

Phase I Environmental Site Assessment for Flatlands Ave. & Pennsylvania Ave. (SMES 2003)

The April 2003 SMES Phase I ESA was completed for the entire CCC property, including the current extents of the Site.

The Phase I ESA did not specifically identify recognized environmental conditions (RECs), but recommended completion of and adherence to a Health and Safety Plan (HASP) and installation of a soil capping system and noted that a methane mitigation system may be required as part of any future building construction. SMES also recommended that future site activities be conducted under the oversight of the New York City Department of Environmental Protection (NYCDEP) or NYSDEC and that all underground storage tanks (USTs) encountered during redevelopment be removed in accordance with all applicable laws. The report also identified that proper removal of all miscellaneous waste that was observed on the subject property, including an abandoned crane, rubber tires, and demolition debris, and completion of a groundwater investigation to evaluate for potential impacts from hydraulically upgradient properties of concern, would be required.

Phase I Environmental Assessment Report (Langan 2018)

Langan conducted a Phase I ESA on behalf of the Volunteer dated 24 August 2018 for the Site. The following RECs were identified in Langan's 2018 Phase I ESA:

- REC-1: Former On-Site Gasoline Filling Station
- REC-2: Former On-Site Automotive Dismantling/Wrecking
- REC-3: Presence of Historic Fill

Each of these RECs was subsequently investigated and is discussed in detail in Section 2.3.2 below.

The Phase I ESA also identified business environmental risks (BERs) including the potential presence of undocumented USTs as a result of historical site operations and potential impacts from current and historical operations conducted at adjacent and nearby properties involving automotive junking and wrecking/dismantling sites, automotive repair, gasoline filling stations, dry cleaners, the use of USTs, spills, and the generation and disposal of hazardous waste.

Phase II Environmental Investigation Report (Langan 2018)

Langan conducted a Phase II EI for the Site in 2018 for the Volunteer. Results of the investigation were summarized in the 24 August 2018 Phase II Environmental Investigation Report, which was submitted to NYSDEC in the BCP Application. The validated analytical results of this investigation are also provided in Tables 1A, 1B, 2A, 2B, and 3A, and 3B summarized on Figures 4, 5A, 5B, 5C, and 6 of this report.

The investigation included advancement of six soil borings (LSB-15 through LSB 20) and five shallow test pits (LTP-1 through LTP-4, and LTP-7), collection of 12 soil samples, installation of one permanent monitoring well (LMW-5), collection of one groundwater sample, and installation and screening of one temporary methane monitoring point adjacent to LSB-19; temporary methane monitoring points were also installed at seven other locations across the entire CCC site footprint. A limited geophysical survey was also completed in the northeastern portion of the Site in the vicinity of the former gasoline filling station on 29 November 2017.

The initial geophysical survey identified five notable buried anomalies in the approximate footprint of the former gasoline filling station, one of which exhibited a hyperbolic GPR response which is typical of USTs. However, no USTs or fill/distribution piping were identified during the test pit investigation completed during the May 2018 Phase II EI, indicating that concrete and metal debris within the fill layer were likely the source of the anomalies identified during the geophysical survey,

Evidence of petroleum impacts (i.e., elevated PID readings, odor, or staining) were not observed in any of the soil borings completed. An approximately 14- to 16-foot thick layer of fill including concrete, brick, asphalt, wood, slag, ash, fabric, and metal debris were generally observed within all soil borings. Depth to water measured in one groundwater monitoring well was 13.7 feet below grade.

Soil analytical results revealed SVOCs were detected in the northern portion of the site in surficial and in the deep soil sample collected from the fill material at concentrations exceeding the Unrestricted Use SCOs and Restricted-Residential RUSCOs. Pesticides and polychlorinated biphenyls (PCBs) were also detected at concentrations exceeding the Unrestricted Use SCOs in surficial and deep samples collected from fill material. Metals were detected at concentrations exceeding the Restricted-Residential RUSCOs at all but one soil boring location and trivalent chromium, nickel, and zinc were also detected above the Unrestricted Use SCOs.

Groundwater analytical results revealed no VOCs, pesticides, or PCBs detected in exceedance of the Standards and Guidance Values for Class GA water (SGVs). The SVOC benzo(a)anthracene, total metals including iron, lead, manganese, and sodium, and concentrations of dissolved metals including iron, manganese, and sodium were detected at concentrations exceeding the SGVs.

One temporary methane monitoring point was installed at 10 feet bgs in the approximate center of the Site and methane concentrations were monitored using a LandTec GEM 2000 Landfill Gas meter every 30 seconds over a period of 5-minutes. No measurable methane concentrations were detected over the 5-minute period at the temporary point installed at the Site or at any of the other seven temporary points installed across the entire CCC site footprint.

Based on the results of the May 2018 Phase II EI, three Areas of Concern (AOCs) related to historical Site operations were identified: former on-site gasoline filling station operations in the northeastern portion of the Site (AOC-1), former automotive dismantling/wrecking operations

(AOC-2), and the historical filling using material of an unknown origin throughout the Site (AOC-3), which are discussed in detail in Section 2.3.2, below.

BCP Application and BCA (2018/2019)

The Volunteer submitted a BCP Application to NYSDEC for the Site on 10 October 2018. A letter was prepared by Knauf Shaw LLP and submitted to the NYSDEC to formally request the BCP Site Name change from 12120 Flatlands Avenue to 12096 Flatlands Avenue in April 2019. The BCA was executed on 31 May 2019.

Remedial Investigation Work Plan (Langan 2020)

A Remedial Investigation Work Plan dated 11 July 2019 was prepared by Langan for the Volunteer. The RIWP was prepared to investigate and characterize "the nature and extent of the contamination at and/or emanating from the brownfield site" per ECL Article 27-1415(2) (Brownfield Cleanup Program) and to further investigate potential on-Site sources and extents of soil and groundwater impacts identified in Langan's 24 August 2018 Phase II EI Report. NYSDEC and NYSDOH provided a RIWP comment letter dated 21 October 2019. These comments were subsequently addressed in the revised RIWP dated 19 May 2020 prepared by Langan and approved by the NYSDEC on 14 July 2020.

The scope of work for the RI presented in the RIWP consisted of:

- A geophysical survey throughout the areas of the Site that were not previously investigated in November 2017;
- Advancement of seven soil borings (LSB-21 through LSB-27) and collection of 22 soil samples (including one duplicate sample);
- Installation of eight permanent monitoring wells (LMW-7 through LMW-14) and collection of nine groundwater samples (including one duplicate sample) from existing well LMW-5 and LMW-7 through LMW-14;
- Survey and gauging of monitoring wells to evaluate groundwater elevation and flow directions; and,
- Installation of eight soil vapor points (LSV-1 through LSV-8) and collection of nine soil vapor samples (including one duplicate sample) and one ambient air sample.

Remedial Investigation Report (Langan 2022)

A Remedial Investigation Report dated 14 January 2022 was prepared by Langan for the Volunteer to document the investigation completed in accordance with the RIWP. The RIR was approved by the NYSDEC on 1 February 2022. The results of the 2021 RI are included in the discussion of the RI activities and results in Section 2.0.

Draft Supplemental Remedial Investigation Report (Langan 2023)

A Draft Supplemental Remedial Investigation Report dated 7 June 2023 was prepared by Langan for the Volunteer to further define the extent of remedial excavation. The Draft SRIR was submitted to the NYSDEC on 9 June 2023 and awaiting approval. The results of the 2023 SRI are included in the discussion of the RI activities and results in Section 2.0.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION AND FINDINGS

The RI was completed in accordance with the Remedial Investigation Work Plan (RIWP) approved by the NYSDEC on 14 July 2020 and Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 375-1, 3.8, 6.8, NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10), and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, with updates. The RI field work was completed to determine the nature and extent of contamination in soil, groundwater, and soil vapor and supplement the findings of the 2018 Phase II EI Report. The SRI was completed in accordance with the sampling plan approved by NYSDEC on 13 April 2023 to supplement the soil findings of the RIR and to further define the extent of remedial excavation proposed herein. The January 2022 RIR and the June 2023 Draft SRIR summarizes the RI and SRI work completed to characterize the nature and extent of contamination at the Site.

The findings of the 2018 Phase II EI, 2021 RI, and 2023 SRI are summarized in the following sections.

2.1 Field Investigation

The investigation completed during the 2018 Phase II EI consisted of the following:

- Completion of a limited geophysical survey within the northeastern portion of the Site in the vicinity of the former gasoline filling station;

- Completion of 6 soil borings (LSB-15 through LSB-20) to approximately 20-feet below grade and collection of 13 soil samples (including one duplicate sample) to assess soil conditions;

- Completion of 5 test pits (LTP-1 through LTP-4, and LTP-7) excavated to approximately 5 and 6.5 feet below grade to further investigate anomalies identified as potential USTs during the limited geophysical survey;

- Installation and sampling of one permanent monitoring well (LMW-5) in order to collect two groundwater samples (including one duplicate sample) to assess Site groundwater conditions; and,

- Installation and screening of one temporary methane monitoring point adjacent to LSB-19 and installation and screening of seven temporary methane monitoring points in the surrounding parcels in order to assess Site methane conditions.

The investigation completed during the 2021 RI consisted of the following:

- Completion of a Site-wide geophysical survey throughout areas of the Site that were not previously investigated during the geophysical survey completed in November 2017 to identify if any subsurface anomalies exist and to assess for the presence of subsurface structures, piping, and underground storage tanks, including previously undiscovered USTs, which may contribute to the presence or migration of contamination.

- Advancement of 7 soil borings (LSB-21 through LSB-27) and collection of 22 soil samples (including one duplicate sample);

- Installation of 8 permanent monitoring wells (LMW-7 through LMW-14) and collection of 10 groundwater samples (including one sample from previously installed LMW-5 and one duplicate sample);

- Survey and gauging of monitoring wells to evaluate groundwater elevation and flow direction; and,

- Installation of 8 soil vapor sampling points (LSV-1 through LSV-8) and collection of 9 soil vapor samples (including one duplicate sample) and one ambient air sample.

The investigation completed during the 2023 SRI consisted of the following:

- Advancement of 8 soil borings (LSB-15A through LSB-20A, LSB-24A, and LSB-27A) and collection of 10 soil samples (including one duplicate sample).

2.1.1 Summary of Remedial Investigation Findings

The findings summarized herein are based on field observations and instrument readings and laboratory analytical results of soil, groundwater, and soil vapor samples collected during the 2018 Phase II EI, 2021 RI, and 2023 SRI. Cross-sectional diagrams showing inferred soil profiles are included as Figure 3. Soil sample results are summarized on Figures 4A and 4B, groundwater sample results are summarized on Figure 5, and soil vapor results are summarized on Figure 6. Findings and conclusions are as follows:

1. <u>Stratigraphy:</u> A fill layer as deep as 30 feet is generally underlain by a native sand layer. Bedrock was not encountered in any of the soil borings advanced during the 2018 Phase II EI or the 2021 RI.

2. <u>Hydrogeology:</u> Groundwater was encountered between el 2.04 and el 2.60 feet NAVD88 (between 12.13 and 17.44 feet below ground surface) during the RI. Based on area topography, observed water level measurements, and the proximity of the Site to Fresh Creek, groundwater flow is to the south toward Fresh Creek and Jamaica Bay.

3. <u>Fill Quality:</u> Up to 30 feet of fill material was identified below ground surface. Contaminants identified within the fill material include SVOCs, metals, pesticides, PCBs, and PFAS (PFOA and PFOS) which were detected at concentrations above Unrestricted Use SCOs, Restricted-Residential RUSCOs, and/or Protection of Groundwater SCOs within this layer. Elevated concentrations of SVOCs, metals, pesticides, PCBs, and PFAS (PFOA and PFOS) in fill material are attributable to fill material imported from the city solid waste incinerator and fill material of unknown origin; detections of SVOCs, metals, and PFAS may also be attributable to historical Site operations for automotive dismantling/wrecking.

4. <u>Groundwater Quality:</u> Elevated concentrations of PAHs and total lead in groundwater are likely attributed to sediment entrainment of fill material in the sample. Elevated concentrations of total and dissolved barium in one groundwater sample collected during the 2021 RI is attributed to sediment entrainment of fill material and isolated impacts related to the presence of fill. Other metals detected in groundwater above the SGVs (total and/or dissolved iron, manganese, and sodium) are attributed to naturally occurring background concentrations. The presence of PFOA and PFOS in groundwater may be

attributable to the presence of fill material, as well as the historical Site operations as an automotive dismantling/wrecking facility.

5. Soil Vapor Quality: Results of the soil vapor sampling identified concentrations of cis-1,2 DCE and vinyl chloride above the monitoring and/or mitigation guidance values per the NYSDOH Soil Vapor Intrusion Matrix guidance values at one of the seven sample locations. Low levels of petroleum-related VOCs were also identified in this sample and across the Site footprint. Petroleum-related VOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the site, but concentrations in soil vapor may be attributable to releases associated with historical Site operations. As CVOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the site, the presence of elevated concentrations of these compounds in one soil vapor sample is attributed to an isolated unknown source. Methane was historically detected in the subsurface circa 1991; however, methane was not detected in the subsurface at the Site or surrounding parcels during the Phase II EI.

2.2 Geological Conditions

Provided below is a description of the geologic and hydrogeologic observations made during the 2018 Phase II EI, 2021 RI, and 2023 SRI. Subsurface profiles are included on Figures 3. Soil boring logs, a groundwater contour map, and groundwater monitoring well construction logs were included in the 2022 RIR and the 2023 SRIR.

2.2.1 Fill Material

The subsurface strata at the Site consists of fill generally consisting of brown, gray, or black fine to coarse sand with varying proportions of fine to coarse gravel, silt, clay, ash, and miscellaneous debris including brick, concrete, asphalt, wood, and glass to depths ranging from approximately 13.5 to at least 30 feet below ground surface (bgs). An ash layer was also identified within the fill layer during the 2018, 2021, and 2023 environmental investigations.

During the 2018 Phase II EI, 2021 RI, and 2023 SRI, the top of a 1.5- to 12-foot thick ash layer was encountered across the site footprint at depths ranging from 4 to 20 feet below existing grade.

2.2.2 Native Soil Layers

Based on subsurface observations made during environmental and geotechnical investigations completed by Langan between 2018 and 2023, fill is underlain by a brown to dark brown or dark gray sand unit with varying proportion of gravel, silt and clay that extended to the determination depths of all borings, which ranged from 20 to 77 feet below grade.

2.2.3 Hydrogeology

Groundwater was encountered between el 2.04 to el 2.60 feet NAVD88 (between 12.13 and 17.44 feet below ground surface) during the 2021 RI. Based on area topography, observed water level measurements, and the proximity of the Site to Fresh Creek, groundwater flow is to the south toward Fresh Creek and Jamaica Bay. A potentiometric surface map is provided as Figure 6 in the RIR and groundwater elevation data is provided in Table 2 of the RIR.

Langan reviewed United States Fish and Wildlife National Wetland Inventory (NWI) and New York State Freshwater Wetlands maps. Based on these documents, no mapped wetlands are listed on the subject property. The nearest wetlands are the Fresh Creek Basin (Estuarine and Marine Deepwater habitat), located approximately 1,400 feet to the southwest of the Site.

2.3 Contaminant Conditions

2.3.1 Conceptual Site Model

A conceptual Site model (CSM) was developed based on the findings of the RI and SRI to produce a simplified framework for understanding the distribution of impacted materials, potential migration pathways, and potentially complete exposure pathways.

Potential Sources of Contamination

Potential sources of contamination have been identified and include past uses of the Site and contaminated fill material. Historical on-Site use as a gasoline filling station and for automotive dismantling/wrecking are potential sources of SVOCs, metals, and PFAS in soil and of PFAS in groundwater. The Site-wide presence of fill as a result of filling with ash and waste from the city solid waste incinerator, as well as additional material of unknown origin, has been established as a source of SVOCs, metals, pesticides, PCBs, and potentially PFAS in soil. Historical on- and off-Site operations for automotive dismantling/wrecking and junkyards is a potential source of PFAS in groundwater. Detections of total metals in groundwater are attributable to sediment entrainment of fill in the samples collected; detections of dissolved metals are attributed to naturally occurring background concentrations and the quality of fill in contact with groundwater at that location.

Petroleum-related VOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the site, but concentrations in soil vapor may be attributable to releases associated with historical Site operations or an unknown off-Site source. As CVOCs were not detected in exceedance of NYSDEC SCOs or SGVs in any soil or groundwater samples collected, the presence of CVOCs in soil vapor are attributed to an isolated unknown source.

Exposure Media

Impacted media include soil, groundwater, and soil vapor. Analytical data indicates that fill material contains SVOCs, pesticides, PCBs and metals at concentrations greater than the Unrestricted Use SCOs, Restricted-Residential RUSCOs, and/or the Protection of Groundwater SCOs and PFAS at concentrations greater than the Unrestricted Use Guidance Values. Groundwater contains SVOCs and metals above the SGVs and PFAS above the NYSDEC guidance thresholds. Soil vapor at the Site is impacted with low levels of petroleum-related VOCs and CVOCs (cis-1,2 DCE and vinyl chloride) which were detected at concentrations above the NYSDOH guidance levels which would trigger monitoring or mitigation if detected as part of a soil vapor intrusion evaluation.

Receptor Populations

The Site currently consists of a vacant gravel-covered lot used for vehicle parking. The Site is enclosed in fencing and access is restricted to personnel completing site investigations and other authorized guests. During Site development and remediation, human receptors will be limited to construction and remediation workers, authorized guests, and design team members visiting the Site; exposures to properties adjacent to the Site as described below will be mitigated by the implementation of a health and safety plan (HASP), a Community Air Monitoring Plan (CAMP), and a Soil/Materials Management Plan (SMMP) discussed herein. Under future conditions, receptors will include the new building tenants, visitors to the building, and building management/maintenance employees.

2.3.2 Description of Areas of Concern

Laboratory analytical results for soil samples were compared to the 6 NYCRR Subpart 375-6.8(a-b) Remedial Program Soil Cleanup Objectives for Unrestricted Use, Restricted-Residential Use, and Protection of Groundwater. Groundwater analytical results were compared to the SGVs. Soil and groundwater were also compared against the NYSDEC Part 375 April 2023 Remedial Programs

Guidelines for Sampling and Analysis of PFAS Guidance Values and the 1,4-dioxane drinking water maximum contaminant level (MCL) adopted by New York State. Soil vapor was compared to NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion Matrices A through C dated October 2006 and revised in May 2017. Soil, groundwater, and soil vapor laboratory analytical results are summarized in Tables 1A through 3, and on Figures 4A, 4B, 5, and 6.

This section discusses the results of the 2018 Phase II EI, the 2021 RI, and the 2023 SRI with respect to the Areas of Concern (AOCs) identified.

<u>AOC-1: Former On-Site Gasoline Filling Station</u>

Historical records identified a gasoline filling/service station in the northeastern corner of the Site from 1949 through 1965. Although not labeled as a gasoline filling station in the 1967 historic Sanborn Map, the one-story structure identified as a gasoline filling station in 1950 remained until 1986. Potential releases of petroleum products, solvents, and/or other hazardous materials associated with these uses during the on-Site operations may have adversely affected soil, groundwater and/or soil vapor.

As discussed in Section 1.4.2, a limited geophysical survey was completed in the vicinity of the former gasoline filling station in November 2017 and identified five subgrade geophysical anomalies. Test pits. Three test pits (LTP-1, LTP-2, and LTP-3) were completed to assess the anomalies and did not identify the presence of USTs. Gasoline impacts were not observed in the field.

Six soil borings (LSB-15 through LSB-20), two groundwater monitoring wells (LMW-5 and LMW-14), and three soil vapor points (LSV-1, LSV-2, and LSV-5) were installed within the extents of the former on-Site gasoline filling station during the 2018 Phase II EI and the 2021 RI and six soil borings (LSB-15A through LSB-20A) were advanced during the 2023 SRI.

<u>AOC-1 Findings Summary</u>

<u>Soil</u>

A total of 13 discrete soil samples (including one duplicate sample) were collected from six borings (LSB-15 through LSB-20) for laboratory analysis in the vicinity of the former on-Site gasoline filling station operation during the investigations completed in 2018 Phase II EI and 2021 RI. During the 2023 RI, a total of 8 discrete soil samples (including one duplicate sample) were collected from six borings (LSB-15A through LSB-20A) for laboratory analysis. A summary of the soil analytical results for AOC-1 is summarized as follows:

- One VOC (acetone) was detected above the Unrestricted Use SCO and Protection of Groundwater SCO. Acetone is a common laboratory contaminant and its presence is not likely indicative of a release or presence of fill.

- Seven SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene) were detected above the Unrestricted Use SCOs, Restricted-Residential RUSCOs, and/or Protection of Groundwater SCOs in three samples from soil borings LSB-15 and LSB-17 collected from the fill and ash layers at depths ranging from 0 to 14 feet bgs.

- Eight metals, including barium, cadmium, trivalent chromium, copper, lead, mercury, nickel, and zinc, were detected above the Unrestricted Use SCOs, Restricted-Residential RUSCOs and/or Protection of Groundwater SCOs in all 17 of the soil samples from soil borings LSB-15 through LSB-20 and LSB-15A through LSB-20A collected from the fill and ash layers at depths ranging from 0 to 21.5 feet bgs.

- Three pesticides, including 4,4'-DDE, 4,4'-DDT, and dieldrin, were detected above Unrestricted Use SCOs in seven soil samples from soil borings LSB-16, LSB-18, LSB-19, and LSB-20 collected from the fill and ash layers at depths ranging from 0 to 16 feet bgs.

- Total PCBs were detected above the Unrestricted Use SCOs in LSB-15 from 0 to 2 feet bgs and in LSB-16 from 14 to 16 feet bgs.

- No herbicides were detected in exceedance of the Unrestricted Use SCOs, Restricted-Residential RUSCOs, or Protection of Groundwater SCOs in any soil samples collected.

- No PFAS were detected in exceedance of the guidance values in any samples collected from within AOC-1 during the 2023 SRI.

Groundwater

Four groundwater samples (including one duplicate sample) were collected from LMW-5 (May 2018 Phase II EI and 2021 RI) and LMW-14 (2021 RI). A summary of the groundwater analytical results for AOC-1 is summarized as follows:

- The SVOCs benzo(a)anthracene and benzo(a)pyrene were detected above the SGV in LMW-5 during the 2018 Phase II EI, however they were not detected above the SGV during the 2021 RI. SVOCs were not detected above the SGVs in LMW-14.

- Four metals, including total and dissolved iron, total and dissolved sodium, total and dissolved manganese, and/or total lead, were detected above the SGVs in all groundwater samples collected between 2018 and 2021. Total lead was detected above the SGV during the 2018 Phase II EI but dissolved lead was not. Neither total nor dissolved lead were detected above the SGV during the 2021 RI.

- PFOA was detected above the guidance values- in both groundwater samples collected during the 2021 RI. PFAS was not sampled during the 2018 Phase II EI.

- VOCs, pesticides, herbicides, and PCBs were not identified above SGVs in any groundwater samples collected.

Soil Vapor

Three soil vapor points (LSV-1, LSV-2, and LSV-5) were installed in or in close proximity to AOC-1. LSV-2 was installed within the northern portion of the extents of the former on-site gasoline filling station. A duplicate sample was collected from LSV-2. A summary of the soil vapor analytical results for samples collected within the vicinity AOC-1 is summarized as follows:

- None of the eight NYSDOH Soil Vapor Intrusion Matrix CVOCs were identified above the monitoring and/or mitigation thresholds in the soil vapor samples.

- Petroleum-related VOCs including benzene, ethylbenzene, toluene, xylenes, 1,2,4-trimethylbenzene, and/or 1,3,5-trimethylbenzene were detected in all soil vapor samples.

- Methane was not detected in the subsurface at the Site or surrounding parcels during the Phase II EI.

AOC-1 Conclusions

Evidence of USTs were not identified during the geophysical survey.

Concentrations of PAHs, metals, pesticides, and PCBs in soil are attributed to the contaminated fill and ash from landfilling activities during the early 1900's. Elevated concentrations of PAHs may also be attributed to the former on-Site gasoline filling station.

Concentrations of the SVOCs benzo(a)anthracene and benzo(a)pyrene were detected in groundwater in exceedance of the NYSDEC SGVs in LMW-5. These exceedances were not identified when the well was resampled during the 2021 RI. The previous presence of these

SVOCs in groundwater are attributed to a combination of sediment entrainment in the sample and the quality of fill in contact with groundwater at that location. Detections of total metals are attributed to sediment entrainment in the samples; and detections of dissolved metals are likely attributable to naturally occurring background concentrations.

Concentrations of the eight NYSDOH Soil Vapor Intrusion Matrix CVOC compounds were not detected above monitoring and/or mitigation thresholds in any of the samples collected in AOC-1. The soil vapor investigation identified low levels of petroleum-related VOCs in the samples. Petroleum-related VOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the Site, but concentrations in soil vapor may be attributable to a former on-Site source that has been otherwise removed or an offsite source.

AOC-2: Former On-Site Automotive Dismantling/Wrecking

Automobile wrecking operations were identified at the Site from 1967 through 1987. The potential exists for adverse environmental impacts to the subsurface due to the potential cumulative effect of unreported petroleum releases associated with these operations.

Soil, groundwater, and soil vapor samples were collected across the entire Site footprint to assess for subsurface impacts associated with AOC-2. A total of 13 soil borings (LSB-15 through LSB-26), nine groundwater monitoring wells (LMW-5 and LMW-7 through LMW-14) and eight soil vapor points (LSV-1 through LSV-6) were installed during the 2018 EI and the 2021 RI and a total of eight supplemental soil borings (LSB-15A through LSB-20A, LSB-24A, and LSB-27A) were installed during the 2023 SRI to investigate subsurface conditions associated with former on-Site automotive dismantling/wrecking activities.

AOC-2 Findings Summary

Soil

A total of 46 discrete soil samples (including three duplicates) were collected from 21 borings (LSB-15 through LSB-27, LSB-15A through LSB-20A, LSB-24A, and LSB-27A) for laboratory analysis for fill from across the Site footprint during the investigations completed in 2018 Phase II EI, 2021 RI, and 2023 SRI. A summary of the soil analytical results for AOC-2 is summarized as follows:

- One VOC (acetone) was detected above the Unrestricted Use SCO. Acetone is a common laboratory contaminant and its presence is not likely indicative of a release or presence of fill.

- Seven SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene) were detected above the Unrestricted Use SCOs, Restricted-Residential RUSCOs, and/or Protection of Groundwater SCOs in six samples from soil borings LSB-15, LSB-17, LSB-21, LSB-23, and LSB-26 collected from the fill and ash layers at depths ranging from 0 to 14 feet bgs.

- Eleven metals, including arsenic, barium, cadmium, trivalent chromium, copper, lead, mercury, nickel, selenium, silver, and zinc barium, cadmium, copper, lead and mercury were detected above the Unrestricted Use SCOs, Restricted-Residential RUSCOs, and/or Protection of Groundwater SCOs in 39 samples collected from 0 to 20 feet bgs in the fill and ash layers.

- Four pesticides, including 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin were detected above Unrestricted Use SCOs in 17 samples collected 0 to 22.5 feet bgs in nine soil borings (LSB-16, LSB-18, LSB-19, LSB-20, LSB-21, LSB-22, LSB-23, LSB-25, LSB-26).

- Total PCBs were detected above the Restricted-Residential RUSCOs in LSB-22 from 4 to 6 feet bgs and were detected above Unrestricted Use SCOs in LSB-15 from 0 to 2 feet bgs, in LSB-16 from 14 to 16 feet bgs and 19.5 to 21.5 feet bgs, in LSB-19 from 18 to 20 feet bgs, and in LSB-26 from 10 to 12 feet bgs.

- No herbicides were detected in exceedance of the Unrestricted Use SCOs, Restricted-Residential RUSCOs, or Protection of Groundwater SCOs in any samples collected.

- PFOS and/or PFOA were detected above the guidance values in seven soil samples collected from soil borings LSB-21 through LSB-24, LSB-26 and LSB-27 from the fill and ash layers at depths ranging from 0 to 12 feet bgs.

Groundwater

Monitoring well LMW-5 and wells LMW-7 through LMW-14 were sampled to characterize subsurface impacts from historical auto dismantling/wrecking operations. The groundwater analytical results are summarized as follows:

- The SVOCs benzo(a)anthracene and benzo(a)pyrene were detected above the SGV in LMW-5 during the 2018 Phase II EI, however they were not detected above the SGV during the 2021 RI. SVOCs were not detected above the SGVs in any other wells.

- Five metals, including total and dissolved barium, total and dissolved iron, total lead, total and dissolved manganese, and total and dissolved sodium, were detected above the SGVs in all groundwater samples collected between 2018 and 2021. Total lead was detected above the SGV during the 2018 Phase II EI but dissolved lead was not; neither total nor dissolved lead were detected above the SGV during the 2021 RI.

- PFOS and/or PFOA were detected above the guidance values in groundwater samples collected where PFAS was analyzed during the 2021 RI.

- VOCs, pesticides, herbicides, and PCBs were not detected above the SGVs in any groundwater samples collected.

Soil Vapor

Soil vapor points LSV-1 through LSV-8 were installed as part of the soil vapor assessment to characterize AOC-2. A duplicate sample was collected from LSV-2. A summary of the soil vapor analytical results for AOC-2 is summarized as follows:

- According to the NYSDOH Soil Vapor Intrusion Matrix A, the cis-1,2 DCE concentration (7.3 µg/m3) in soil vapor was identified above the monitoring and/or mitigation threshold of 6 µg/m3 in one soil vapor samples (LSV-4). According to the NYSDOH Soil Vapor Intrusion Matrix C, the vinyl chloride concentration (22 µg/m3) in soil vapor was identified above the monitoring and/or mitigation threshold of 6 µg/m3 in one soil vapor sample (LSV-4).

- Petroleum-related VOCs including benzene, ethylbenzene, toluene, xylenes, 1,2,4-trimethylbenzene, and/or 1,3,5-trimethylbenzene were identified at cumulative concentrations that ranged from 10.9 µg/m3 at LSV-1 to 59 µg/m3 at LSV-4. Low levels of petroleum-related compounds were detected in all soil vapor samples collected. The highest concentrations of petroleum related compounds were identified in LSV-4 located in the central portion of the Site.

AOC-2 Conclusions

Evidence of USTs were not identified during the geophysical survey.

Concentrations of PAHs, metals, pesticides, PCBs, and PFAS in soil above the Unrestricted Use SCOs, Protection of Groundwater SCOs, and/or Restricted-Residential RUSCOs identified across the Site footprint are attributed to the contaminated fill and ash from landfilling activities during the early 1900's. Concentrations of PAHs, metals, and PFAS may also be attributed to historical automotive dismantling operations.

Elevated concentrations of total and dissolved metals in groundwater are attributed to sediment entrainment in the samples or naturally occurring background concentrations, with the exception of elevated concentrations of total lead at LMW-5 total and dissolved barium at LMW 12. The elevated concentrations of these compounds are attributed to a combination of sediment entrainment in the sample and the quality of fill in contact with groundwater quality of fill at that location. Additionally, the presence of PFOS and PFOA in all groundwater samples collected throughout the Site may be attributable to former on-Site automotive dismantling/wrecking or the presence of fill. Concentrations of the SVOCs benzo(a)anthracene and benzo(a)pyrene were detected in groundwater in exceedance of the NYSDEC SGVs in LMW-5. These exceedances were not identified when the well was resampled during the 2021 RI. The previous presence of these SVOCs in groundwater are attributed to a combination of sediment entrainment in the sample and the quality of fill in contact with groundwater at that location.

Two CVOCs (cis-1,2 DCE and vinyl chloride) were detected in exceedance of the NYSDOH Soil Vapor Intrusion Matrix monitoring and/or mitigation threshold values at one sample location (LSV-4). As CVOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the Site, the presence of elevated concentrations of these compounds in one soil vapor sample is attributed to an isolated unknown source. The soil vapor investigation identified low levels of petroleum-related VOCs in the samples. Petroleum-related VOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the Site, but concentrations in soil vapor may be attributable to a former on-Site source that has been otherwise removed or an off-Site source.

AOC-3: Presence of Fill

Based on the review of the 2003 Phase I ESA prepared by Soil Mechanics and the 1991 Technical Memorandum prepared by AKRF, which were prepared for a larger 10-acre area of which the Site is a part, the area was reportedly filled with ash and waste from the city solid waste incinerator. Based on subsurface observations made during environmental and geotechnical investigations completed by Langan between 2018 and 2023, the subsurface strata at the Site consists of fill generally consisting of brown, gray, or black fine to coarse sand with varying proportions of fine to coarse gravel, silt, clay, ash, and miscellaneous debris including brick, concrete, asphalt, wood, and glass to depths ranging from approximately 13.5 to at least 30 feet below grade. The ash layer was identified within the fill layer during the 2018, 2021, and 2023 environmental investigations.

During the 2018 Phase II EI, 2021 RI, and 2023 SRI, the top of a 1.5- to 12-foot thick ash layer was encountered across the site footprint at depths ranging from 4 to 20 feet below existing grade.

Soil, groundwater, and soil vapor samples were collected across the entire Site footprint to assess for subsurface impacts associated with fill. This included 13 soil borings (LSB-15 through LSB-27), nine groundwater monitoring wells (LMW-5, LMW-7 through LMW-14) and eight soil vapor points (LSV-1 through LSV-8). Eight supplemental soil borings (LSB-15A through LSB-20A, LSB-24A, and LSB-27A) were installed during the 2023 SRI.

Soil, groundwater, and soil vapor samples were collected across the entire Site footprint to assess for subsurface impacts associated with former on-Site operations (AOC-2) and historic fill. Analytical results for these samples are presented in the discussion of AOC-2 above.

AOC-3 Conclusions

Evidence of USTs were not identified during the geophysical survey.

Concentrations of PAHs, metals, pesticides, PCBs, and PFAS in soil are attributed to the contaminated fill and ash from landfilling activities during the early 1900's. The top of the ash layer varied between 4 and 20 feet below existing grade and was observed to a maximum depth of 20 feet below existing grade in the southern portion of the Site.

Concentrations of the SVOCs benzo(a)anthracene and benzo(a)pyrene were detected in groundwater in exceedance of the NYSDEC SGVs in LMW-5. These exceedances were not identified when the well was resampled during the 2021 RI. The previous presence of these SVOCs in groundwater are attributed to a combination of sediment entrainment in the sample and the quality of fill in contact with groundwater at that location.

Detections of total metals in groundwater are attributed to sediment entrainment in the samples and the quality of fill in contact with groundwater at that location; and detections of dissolved metals are likely attributable to naturally occurring background concentrations. Additionally, the presence of PFOS and PFOA in all groundwater samples collected throughout the Site may be attributable to the presence of fill.

Two CVOCs (cis-1,2 DCE and vinyl chloride) were detected in exceedance of the NYSDOH Soil Vapor Intrusion Matrix monitoring and/or mitigation threshold values at one sample location (LSV-4). As CVOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the Site, the presence of elevated concentrations of these compounds in one soil vapor sample is attributed to an isolated unknown source. The soil vapor investigation identified low levels of petroleum-related VOCs in the samples. Petroleum-related VOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the Site, but concentrations in soil vapor may be attributable to a former on-Site source that has been otherwise removed or an offsite source.

2.3.3 Nature and Extent of Contamination

Soil Contamination

During environmental investigations completed by Langan in 2018, 2021, and 2023 an ash and fill layer consisting of fine to coarse sand with varying proportions of ash, silt and gravel and miscellaneous debris, including brick, wood, asphalt, glass, concrete, and metal extending from surface grade to between 14 and 30 feet bgs was observed. Forty-three soil samples were collected from the ash/historic fill layer between 0 and 22.5 feet bgs during the investigations.

The VOC acetone was detected in exceedance of the Unrestricted Use SCO and Protection of Groundwater SCO. Acetone is a common laboratory artifact and is likely not associated with historical site uses. No other VOCs were detected above the Unrestricted Use SCOs, Restricted-Residential RUSCOs, or Protection of Groundwater SCOs in any samples collected.

SVOCs commonly associated with the presence of fill material including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene, were detected from 0 to 2 and 10 to 14 feet bgs in six of 43 fill samples collected for SVOC analysis throughout the Site footprint at concentrations exceeding the Unrestricted Use SCOs, Restricted-Residential RUSCOs, and/or Protection of Groundwater SCOs. SVOCs benzo(k)fluoranthene and chrysene were also detected above the Unrestricted Use SCOs and/or Protection of Groundwater SCOs in four fill samples collected from 0 to 2 to and 12 to 14 feet bgs.

Metals including arsenic, barium, cadmium, trivalent chromium, copper, lead, mercury, nickel, selenium, silver, and/or zinc were detected from 0 to 22.5 feet bgs in 39 soil samples collected for metals analysis throughout the Site footprint at concentrations exceeding Unrestricted Use SCOs, and/or Protection of Groundwater SCOs. Barium, cadmium, copper, lead, and mercury were also detected above the Restricted-Residential RUSCOs from 0 to 20 feet bgs in 20 of the 43 soil samples collected for metals analysis.

Pesticides including 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin were detected from 0 to 22.5 feet bgs at concentrations exceeding the Unrestricted Use SCOs in 17 of 43 fill samples collected for pesticides analysis.

Total PCBs were detected from 0 to 21.5 feet bgs at concentrations exceeding the Unrestricted Use SCOs and/or Protection of Groundwater SCOs in six of 43 fill samples collected for PCB analysis and exceeding the Restricted-Residential RUSCOs in one sample.

PFAS compounds including PFOS and PFOA were detected from 0 to 12 feet bgs at concentrations exceeding the Unrestricted Use Guidance Values in seven of the 31 soil samples collected for which it was analyzed during the 2021 RI. PFAS compounds were not analyzed in samples collected during the 2018 Phase II EI.

Elevated concentrations of SVOCs, metals, pesticides, PCBs, and PFAS in fill material are attributed to fill material from the city solid waste incinerator and fill of unknown origin; the presence of SVOCs, metals, and PFAS may also be attributable to historical automotive dismantling operations.

Groundwater Contamination

Groundwater was encountered between 12 and 17.44 feet below ground surface and at depths corresponding to between el 2.04 and 2.6 NAVD88 during the RI. Nine monitoring wells were sampled during the 2021 RI, including one well that was previously installed and sampled during the 2018 Phase II EI.

SVOCs were not detected above the NYSDEC SGVs in any groundwater samples collected during the 2021 RI; however, benzo(a)anthracene and benzo(a)pyrene were detected at concentrations exceeding the SGVs in the groundwater sample collected from LMW-5 during the 2018 Phase II EI. The elevated concentrations of PAHs detected in groundwater in 2018 are attributed to sediment entrainment of fill material of unknown origin in the sample and are not indicative of any discrete releases to the subsurface. PAHs in soil are not considered to be an ongoing source of groundwater contamination.

Total metals including lead, barium, iron, manganese, and/or sodium were detected in groundwater in exceedance of the SGVs in all eight monitoring wells. Total lead was detected in LMW-5 during the 2018 Phase II EI and was not identified in samples collected during the 2021 RI. Dissolved lead was not detected above the SGVs during the 2018 Phase II EI and, as such, the detection of total lead is attributed to sediment entrainment in the sample. Elevated concentrations of barium in soil are present throughout the Site footprint; however, total and dissolved barium were detected above the SGV in only one well, LMW-12, during the 2021 RI. The detection of barium in groundwater is attributed to a combination of sediment entrainment in the sample and the quality of fill in contact with groundwater at that location. Based on the isolation detection of total and dissolved barium in groundwater, barium concentrations in soil are not considered to be an ongoing source of groundwater contamination. Other metals detected in exceedance of NYSDEC SGVs (total and/or dissolved iron, manganese, and sodium) were identified throughout the Site footprint and are attributed to a combination of sediment entrainment in the sample and naturally occurring background concentrations.

PFOS and PFOA were detected above the guidance screening level of 10 ng/L in all eight monitoring wells throughout the Site footprint. The presence of PFOS and PFOA in groundwater may be attributable to former on-Site automotive dismantling/wrecking across the Site footprint from 1967 to 1987 and/or the fill material.

Groundwater sample analytical results did not identify the presence of VOCs, pesticides, herbicides, or PCBs at concentrations above the SGVs in any samples for which it was analyzed.

Soil Vapor Contamination

Eight soil vapor samples were collected during the 2021 RI. Analytical results revealed the CVOCs cis-1,2 DCE and vinyl chloride at concentrations which would be above the monitoring and/or mitigation threshold according to NYSDOH Soil Vapor Intrusion Guidance Matrix A and B if detected as part of a soil vapor intrusion evaluation in one sample collected from the central portion of the site. Soil vapor sample analytical results also identified low concentrations of petroleum-related VOCs at all sample locations throughout the site footprint.

Petroleum-related VOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the site, but concentrations in soil vapor may be attributable to releases associated with historical Site operations or an unknown source. As CVOCs were not detected at concentrations exceeding NYSDEC threshold values in soil or groundwater at the site, the presence of elevated concentrations of these compounds in one soil vapor sample is attributed to an isolated unknown source.

2.4 Qualitative Human Exposure Assessment

Based upon the CSM and the review of environmental data, incomplete exposure pathways appear to be present under current conditions at the Site if the Site is not remediated. Institutional controls will be implemented to prevent complete on-Site exposure pathways in construction/remediation and future conditions.

Complete exposure pathways have the following five elements: 1) a contaminant source; 2) a contaminant release and transport mechanism; 3) a point of exposure; 4) a route of exposure; and 5) a receptor population. A discussion of the five elements comprising a complete pathway as they pertain to the Site is provided below. In addition to the human health exposure assessment, NYSDEC DER-10 requires an on-Site and off-Site Fish and Wildlife Resources Impact Analysis (FWRIA) if certain criteria are met. Based on the requirements stipulated in Section 3.10 and Appendix 3C of DER-10, a FWRIA for the Site is not required.

2.4.1 Current Conditions

The Site is located on the south side of Flatlands Avenue in Brooklyn, New York, and is designated as New York City Tax Block 4434, Lot 10. The Site consists of a vacant gravel lot used for surplus parking for the CCC building located to the west of the Site.

The Site is bound to the north by Flatlands Avenue followed by a gasoline filling station, automotive repair facility, carwash, and Sheffield Avenue. The Site is bound to the east by Pennsylvania Avenue followed by a vacant landscaped lot and the northern courtyard of a twenty-story residential building (part of the Starrett City Complex), to the south by a twelve-story multi-family residential building, and to the west by the western extents of the gravel lot currently used for surplus parking by the CCC.

The Site is enclosed in fencing and access is restricted to personnel completing Site investigations and other authorized guests. Human exposure to contaminated soil is currently limited by the gravel layer covering the Site; therefore, exposure to contaminated soil in the near surface is only possible if there were to be a breach of the gravel layer, to individuals with access to the Site, including personnel completing site investigations, and other authorized guests. There could be a complete exposure pathway for dermal and ingestion exposure if the authorized personnel were not adhering to the HASP during invasive investigation or remediation work that allows contact with soil beneath the gravel.

Due to the depth of groundwater, and the fact that groundwater in New York City is not used as a potable water source, there is no complete exposure pathway to groundwater under current Site conditions. However, there is a potential exposure pathway through dermal absorption, inhalation, and ingestion during investigative groundwater sampling, but has been and will be controlled through the implementation of the HASP during sampling.

As there are no buildings present on Site, there are no current on-Site exposure pathways for soil vapor intrusion. Impacted soil vapor may migrate vertically through the subsurface and dissipate and dilute with ambient air; as such, there is no potential exposure pathway under current conditions. Any remaining potential exposure pathways through dermal absorption and inhalation is controlled through the implementation of a HASP during ground-intrusive work.

In localized areas where human exposure to contaminated soil, groundwater, and soil vapor is possible during soil, groundwater and soil vapor sampling, the potential exposure pathways for dermal absorption, inhalation and ingestion are controlled through implementation of a HASP.

2.4.2 Construction/Remediation Activities

Construction and remediation may result in potential exposures to Site contaminants in the absence of a HASP, CAMP, and a SMMP. Construction and remedial activities will likely include excavation and off-Site disposal of contaminated soil, dewatering of contaminated groundwater, and construction of foundation components. In the absence of a HASP, CAMP, and SMMP, this scenario presents the potential for exposure of soil, groundwater, and soil vapor contaminants to construction and remediation workers via dermal absorption, ingestion, and inhalation of vapors and particulate matter. However, this exposure pathway will be mitigated through the implementation of the HASP, CAMP, and SMMP, including vapor and dust suppression techniques to avoid the creation of the exposure pathway in the first place.

2.4.3 Proposed Future Conditions

The proposed future use of the Site consists of construction of two mixed-use commercial/residential towers in the central and eastern portion of the Site with a single cellar level across the majority of the Site footprint. A private roadway will be constructed at street level on the western portion of the Site. The residential portions of the buildings will be comprised of 100% income-based affordable housing, while the commercial portions will be used for a neighborhood community facility and/or retail space. The cellar will consist of below grade parking, mechanical rooms housing utilities, compactors, and telecom equipment, a laundry room, offices for building maintenance and management, and bicycle and miscellaneous storage. An electrical vault and stormwater detention tanks are proposed in the northwestern portion of the Site, outside of the cellar footprint and beneath the future roadway.

New development will incorporate institutional controls that will prevent human exposure to impacted soil, groundwater, and soil vapor following implementation of the remedy. Protective measures implemented during remediation and remedial construction will eliminate points of exposure as the result of Site work. A vapor barrier/waterproofing membrane as a green remediation component will also serve as a mitigation measure to prevent any future human exposure to soil vapor that may remain after the extensive remedial source removal effort is implemented.

2.4.4 Human Health Exposure Assessment Conclusions

1. Under current conditions, there is a marginal risk for exposure only if there is a breach of the gravel layer. The primary exposure pathways are for dermal contact, ingestion and inhalation of soil or soil vapor by authorized site personnel in instances where the integrity of the gravel layer is compromised or during site investigation. Exposure to groundwater is limited to those completing investigation activities. The exposure risks can be avoided or minimized by limiting Site access and implementing the appropriate health and safety and vapor and dust suppression measures outlined in a Site-specific HASP and CAMP during ground-intrusive activities.
2. In the absence of protective measures, there is a moderate risk of exposure during the construction and remediation activities. The primary exposure pathways are:
   a. Dermal contact, ingestion and inhalation of contaminated soil, groundwater, or soil vapor by Site visitors and construction and remediation workers.
   b. Dermal contact, ingestion and inhalation of soil (dust) and inhalation of soil vapor by the community in the vicinity of the Site.

   These exposure pathways can be avoided or minimized by performing community air monitoring and by following the appropriate health and safety plans, implementing vapor and dust suppression techniques, and using Site security to control access.
3. A complete exposure pathway is possible for the migration of Site contaminants to off-Site human receptors during the remedial construction phase. During this phase, Site access will be limited to authorized personnel and workers and protective

measures will be used during construction to prevent completion of this pathway, including following a Site-specific HASP and implementation of a CAMP.

4. The existence of a complete exposure pathway for Site contaminants to human receptors during proposed future conditions is unlikely, as on-Site sources of contamination will be excavated and transported for off-Site disposal. Regional groundwater is not used as a potable water source in this part of New York City.

2.5 Remedial Action Objectives

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been identified:

2.5.1 Soil

RAOs for Public Health Protection:

- Prevent ingestion/direct contact with contaminated soil

RAOs for Environmental Protection:

- Prevent migration of contaminants that would result in groundwater or surface water contamination

2.5.2 Groundwater

RAOs for Public Health Protection:

- Prevent ingestion of groundwater with contamination levels exceeding drinking water standards

RAOs for Environmental Protection:

- Remove Site source(s) of groundwater contamination

2.5.3 Soil Vapor

RAOs for Public Health Protection:

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into building(s) at the Site.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

This section presents an analysis of the proposed remedial alternatives that can potentially be achieved under the BCP. The proposed SCOs under Alternative I will be the Part 375 Unrestricted Use SCOs under the preferred Track 1 cleanup. Alternative II will be a Track 2 Restricted Residential cleanup in the event that some source material, documented by a significant number of endpoint confirmation samples above the Restricted Residential RUSCOs, remains present at the bottom of the planned excavation, and over-excavation is not deemed to be feasible. Alternative II would include implementation of long-term institutional controls in the form of a Site Management Plan and an Environmental Easement. Both alternatives are expected to achieve the established RAOs. SCOs for Alternatives I and II are presented in Table 4.

3.1 Technical Description of Alternative I – Track 1

- Development and implementation of a CHASP and CAMP for the protection of on-Site workers, community/residents, and the environment during remediation and construction activities.
- Construction of the support of excavation (SOE) system to facilitate the Track 1 remediation.
- Dewatering in compliance with city, state, and federal laws and regulations. Extracted groundwater will be managed under a permit from NYCDEP/NYSDEC that will be required to meet effluent limitations prior to discharge to the sewer system.
- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations.
- Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work.
- Excavation, stockpiling, off-Site transport, and disposal of soil that exceeds Unrestricted Use SCOs as defined by 6 NYCRR Part 375-6.8, and as needed for the remediation as follows:
    - The entire Site footprint will be excavated from ground surface to between 15 and 20 feet bgs to remove known elevated concentrations of SVOCs, metals, PCBs, and pesticides exceeding the Unrestricted Use SCOs at various locations throughout the Site footprint.
        - Approximately 18,550 square feet (approximately 27% of the Site footprint) will be excavated to 15 feet below existing grade.

  - Approximately 22,850 square feet (approximately 33% of the Site footprint) will be excavated to 16 feet below existing grade.
  - Approximately 27,075 square feet (approximately 40% of the Site footprint) will be excavated to 20 feet below existing grade.

- Additional 15- by 15-foot hotpot excavations to remove elevated concentrations of metals, PCBs, and pesticides above the Unrestricted Use SCOs will be completed throughout the site footprint as follows:
  - One hotspot centered on LSB-22 will be excavated from the base of the 15-foot mass remedial excavation to approximately 16 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
  - One hotspot centered on LSB-20 will be excavated from the base of the 16-foot mass remedial excavation to approximately 18 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
  - One hotspot centered on LSB-18 will be excavated from the base of the 16-foot mass remedial excavation to approximately 19.5 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
  - One hotspot centered on LSB-19 will be excavated from the base of the 20-foot mass remedial excavation to approximately 21 feet bgs for the remediation of metals and PCBs at concentrations above the Unrestricted Use SCOs.
  - One hotspot centered on LSB-16 will be excavated from the base of the 20-foot mass remedial excavation to approximately 22.5 feet bgs for the remediation of metals and PCBs at concentrations above the Unrestricted Use SCOs.
  - One hotspot centered on LSB-26 will be excavated from the base of the 20-foot mass remedial excavation to approximately 23.5 feet bgs for the remediation of metals and pesticides at concentrations above the Unrestricted Use SCOs.

- Appropriate off-Site disposal of material removed from the Site in accordance with federal, state and local rules and regulations for handling, transport, and disposal.
- Removal and decommissioning of any encountered USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and disposal off-Site during Site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Collection and analysis of confirmation soil samples from the excavation base in accordance with DER-10 to confirm Track 1 SCOs were achieved; over-excavation may be completed if feasible to meet the Unrestricted Use SCOs.
- Importation and backfilling of remediated areas, as necessary for development, with certified-clean material (meeting Track 1 SCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone to backfill areas excavated deeper than the development depth.
- Installation of a vapor barrier membrane below the slab of the proposed building and along sidewalls of any subgrade foundation elements beneath occupied spaces as a green remediation component.
- All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

The Alternative I remediation extent is shown on Figure 7 and is based on data presented in the RIR.

3.1.1 On-Site Worker, Public Health, and Environmental Protection

A Site-specific HASP will be enforced during excavation and foundation construction to protect on-Site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health will be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP and in this RAWP. The CAMP will include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. A field engineer, scientist, or geologist will monitor Site perimeters for visible dust and odors. The environment will be protected by implementing and enforcing the appropriate soil erosion prevention measures.

3.1.2 SOE Construction and Fill and Soil Removal

VOCs, SVOCs, pesticides, PCBs, and metals were detected at concentrations that exceed the Track 1 Unrestricted Use SCOs. To achieve a Track 1 remedy, soil present from ground surface to between 15 and 20 feet bgs that exceeds the Unrestricted Use SCOs will be excavated for off-Site disposal. In addition, six 15- by 15-foot hotspot excavations centered on LSB-16 (to 22.5 feet bgs), LSB-18 (to 19.5 feet bgs), LSB-19 (to 21 feet bgs), LSB-20 (to 18 feet bgs), LSB-22 (to 16 feet bgs), and LSB-26 (to 23.5 feet bgs) will be completed to remove RI samples with analytical results exceeding the Track 1 SCOs.

An SOE system will be constructed around the Site boundary to accommodate remedial excavation for removal of soil exceeding Track 1 SCOs up to approximately 20 feet bsl across the Site footprint and to accommodate excavation for Site redevelopment to approximately 23.75 feet bgs (with deeper excavations to between 25.5 and 27.5 feet bsl for deeper foundation elements).

The estimated volume of material requiring removal and off-Site disposal for a Track 1 cleanup is about 44,000 cubic yards. This estimate is based on vertical excavation limits derived from the field observations and laboratory analytical results presented in the 2018 Phase II EI, the 2022 RI, and the 2023 SRI reports. Soil will be screened for visual, olfactory, and instrumental evidence of environmental impacts during excavation. Over-excavation beyond the proposed extents could be necessary to remove soil that does not comply with the Unrestricted Use SCOs following endpoint sample collection and/or represents a source of groundwater or soil vapor contamination.

The excavated material will be transported and disposed off-Site in accordance with municipal, state, and federal regulations. Remediation would take place concurrently with development. The estimated extent of the remedial excavation for the Track 1 alternative is shown on Figure 7.

3.1.3 Excavation Dewatering

Dewatering of groundwater will be required to accommodate remedial excavation of soil that exceeds Track 1 Unrestricted Use SCOs. The contractor will be responsible for dewatering in accordance with applicable New York City Department of Environmental Protection (NYCDEP) and NYSDEC regulations. Management of dewatering fluids will be required to meet NYCDEP/NYSDEC effluent limitations prior to discharge. The dewatering and treatment system will be designed by the contractor’s NYS-licensed Professional Engineer.

3.1.4 UST System Removal

If encountered, any USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) will be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances will be registered and administratively closed with the NYSDEC petroleum bulk storage (PBS) unit. All excavation areas will be screened and inspected for the presence of petroleum-impacts to the surrounding soils. Petroleum-impacted soil, if encountered, will be excavated, stockpiled separately, characterized, and disposed of off-Site at a permitted disposal facility in accordance with applicable regulations. If the remedial or development excavation depth does not extend beyond the bottom of the encountered tank, additional confirmation soil samples will be collected as required. Closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the Final Engineering Report (FER).

3.1.5 Confirmation Soil Sampling

Confirmation soil samples will be collected from the excavation base at a frequency of one per 5,000 square feet. Sidewall samples will not be collected from the site perimeter because excavation will extend across the site footprint and SOE measures (e.g., sheeting and lagging) will preclude access to soil sidewalls. An estimated 14 confirmation soil samples, plus QA/QC samples, will be collected to confirm remedial performance and will be analyzed for the Part 375 list of VOCs, SVOCs, PCBs, pesticides/herbicides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane.

In the location of the suspected UST(s) or unidentified USTs, if the remedial or development excavation depth does not extend beyond the bottom of the encountered tank, five documentation samples will be collected from each excavation and will consist of one sample per excavation sidewall and a sample from each excavation base. As necessary, post removal soil samples will be collected in accordance with the requirements of CP-51. Samples will be analyzed for CP-51 List VOCs and SVOCs and compared to the CP-51 Table 2 Soil Cleanup Levels for Gasoline Contaminated Soils or Table 3 Soil Cleanup Levels for Fuel Oil Contaminated Soil and the 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs, depending on the contents of the USTs. If the remedial or development excavation depth does extend beyond the bottom of the encountered tank, a post-excavation base confirmation soil sample will be biased to the tank's location when collected upon completion of Site excavation.

3.1.6 Imported Material for Excavation Backfill

After the Track 1 remedial excavation is completed, portions of the Site would need to be backfilled where necessary to restore the Site grade to the development elevation needed for foundation construction. Any imported backfill shall comply with 6 NYCRR Part 375-6.7(d) and NYSDEC DER-10 Section 5.4(e), Table 5.4(e)10, and Appendix 5, and the April 2023 Sampling, Analysis, and Assessment of PFAS Under NYSDEC's Part 375 Remedial Programs.

Imported material for excavation backfill will consist of clean fill that meets the Track 1 SCOs, Sampling, Analysis, and Assessment of PFAS Under NYSDEC's Part 375 Remedial Programs guidance document (April 2023), and Part 360.13(f) requirements for acceptable fill material uses, or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will come from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities will not require chemical testing, unless required by NYSDEC under its terms for operation of the facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10% by weight passing through a No. 10 sieve). RCA is not acceptable for, and will not be used as, Site cover or drainage material.

3.1.7 Vapor Barrier/Waterproofing Membrane

As presented on the drawings in Appendix B, the proposed building cellar will be constructed within the groundwater elevation range measured during the RI (generally between el -2 and el 2 NAVD88). A vapor barrier membrane will be installed beneath the building as a green remedial element and will also mitigate the potential for impacted soil vapor intrusion in the new building. The vapor barrier membrane will be installed under the slab and along sidewalls of any subgrade foundation elements spaces, will be a minimum 20 mil thickness, and will be compatible with potential petroleum and CVOC contaminants.

3.2 Technical Description of Alternative II – Track 2

Alternative II, a Track 2 Restricted Residential remedy, would include all of the elements of Alternative I, with the following modifications:

- Collection and analysis of documentation soil samples to document soil quality remaining at the Site, some of which may not meet the Unrestricted Use SCOs.
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site and prohibitions on sensitive Site uses, such as farming or vegetable gardening, to eliminate future exposure pathways.

- Establishment of an approved SMP to ensure long-term management of institutional controls, including periodic certification that the controls are performing as they were intended.
- Recording of an Environmental Easement (EE) to memorialize the remedial action and the engineering and institutional controls to ensure that future owners of the Site continue to maintain these controls as required

The Alternative II remediation extent is shown on Figure 8 and is based on data presented in the RIR and the proposed development plans. The requirements for each of the Alternative II tasks, as modified from the Alternative I tasks, are described below.

3.2.1 SOE Construction and Fill and Soil Removal

The Phase II EI, RI, and SRI revealed that fill is present up to 30 feet bgs at various locations at the Site. As such, even the relatively deep proposed excavation depth for the Track 1 remedy (approximately 15 to 20 feet below street level across the majority of the Site footprint) may not remove all fill-related contamination that exceeds the Unrestricted Use SCOs. As a result, only a Track 2 remedy may be possible on all or some portions of the Site depending on the extent of the material containing concentrations of contaminants exceeding Track 2 Restricted Residential RUSCOs remaining following the remedial excavation.

An SOE system will be constructed around the perimeter of the excavation area to accommodate Site-wide removal of soil to achieve a Track 2 cleanup. The excavated material will be transported and disposed off-Site in accordance with municipal, state, and federal regulations. Remediation would take place concurrently with development. The estimated extent of the remedial excavation for the Track 2 alternative is shown on Figure 8.

3.2.2 Documentation Soil Sampling

As described in Section 3.1.2, confirmation samples will be collected to confirm remedial performance; however, if the confirmation sample exceeds the Unrestricted Use SCOs, the sample will be identified as a documentation soil sample and will be used to evaluate soil to remain in place after the development.

3.2.3 Environmental Easement

An environmental easement will be recorded referencing Institutional Controls (ICs) that are part of the selected remedy, which will be binding upon all subsequent owners and occupants of the property. The ICs will: 1) restrict the Site to restricted residential, commercial and industrial uses, although land use is subject to local zoning laws; 2) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC or NYSDOH; 3) require implementation of an NYSDEC-approved SMP; 4) require the completion and submission to the NYSDEC a periodic certification of ICs in accordance with Part 375; and 5) include a Soil Excavation Work Plan to manage future excavation of on-Site soil.

3.2.4 Site Management Plan

The SMP will identify all use restrictions and long-term monitoring and maintenance requirements to ensure the ICs remain in place and are effective. The SMP will include, but may not be limited to:

1. Descriptions of the provisions of the environmental easement including any land use, and/or groundwater use restrictions.
2. Maintaining Site access controls and NYSDEC notification.
3. The steps necessary for the periodic reviews and certification of the ICs.

3.3 Evaluation of Remedial Alternatives

The following is an evaluation of the proposed remedial alternatives based on the NYSDEC BCP remedy evaluation criteria listed below. The first two criteria are considered "threshold criteria", and the remaining criteria are "balancing criteria." A remedial alternative must meet the threshold criteria in order to be considered and evaluated further under the balancing criteria.

1. Protection of Human Health and Environment
2. Compliance with Standards Criteria and Guidance (SCGs)
3. Short-Term Effectiveness and Impacts
4. Long-Term Effectiveness and Permanence
5. Reduction of Toxicity, Mobility, or Volume
6. Implementability
7. Cost Effectiveness
8. Community Acceptance
9. Land Use

3.3.1 Overall Protection of Public Health and the Environment

Alternative I - This remedy will eliminate pathways of exposure from on-Site contaminated media. Remediating the Site to Track 1 standards will result in the removal of all on-Site soil with contaminant concentrations above Unrestricted Use SCOs to between 15 and 23.5 feet bgs. Excavation across the entire Site footprint will be required to remove contaminants in material above Unrestricted Use SCOs.

Alternative II – This remedy will also eliminate pathways of exposure from on-Site contaminated media; however, the Track 1 Unrestricted Use SCOs will not be achieved in every confirmation sample collected from the base of the remedial excavation and some source material and residual contaminants may remain present. The environment will be protected by implementing and enforcing soil management controls when needed during future Site excavation and any other institutional and engineering controls by implementation of the SMP and through enforcement of the EE.

For each Alternative, any encountered USTs would be decommissioned, removed and disposed off-Site, and petroleum-impacted material, if encountered, would be excavated and disposed off-Site. The RAOs for public health and environmental protection will be met through the removal of contaminated source soil, which will eliminate possible ingestion, inhalation, or dermal contact.

Public health will be protected during remediation under both remedial alternatives by implementing and enforcing dust, odor, and organic vapor control and monitoring plans, procedures when needed.

3.3.2 Compliance with Standards, Criteria, and Guidance

Both Alternatives will be in compliance with all applicable standards, criteria, and guidance listed in Section 4.1.1 by removing a majority of on-Site sources of contamination to achieve the RAOs or through the use of long term Site Management controls. While implementing either remedy, protection of public health and the environment will be maintained by enforcing a Site-specific HASP and CAMP. Occupational Safety and Health Administration (OSHA) requirements for on-Site construction safety will be followed by Site contractors performing work.

3.3.3 Short-Term Effectiveness and Permanence

Alternative I - In the short-term, there will likely be increased truck traffic and operational noise levels associated with the transport of impacted material excavated to achieve Track 1 standards and the import of backfill required to bring the Site to construction grade in the northwestern portion of the site.

Disposal of the excavated soil and fill will require about 2,200 20-cubic-yard trips and importing material to backfill the excavation and raise Site grades to the development elevation will require about 100 20-cubic yard trips. Implementing the Alternative I concept will require approximately 6 months of effort (assuming normal work hours). Flaggers will be used to protect pedestrians at Site entrances and exits. Dust, odors, and/or organic vapor from the excavation and construction-related noise all need to be controlled during this period of time.

Alternative II — A Track 2 remedial excavation would involve comparable soil removal related to construction, for a similar duration as Alternative I but some end point samples may not achieve the Unrestricted Use SCOs. The excavated soil and fill would require the same approximately 2,200 20-cubic-yard truck trips. Implementing the Alternative II concept would also require approximately 6 months of effort (assuming normal work hours). Dust, odors, and potential organic vapor from the excavation and construction-related noise would have a similar duration relative to Alternative I. This remedy is similar in scope to Alternative I, and therefore has a similar level of permanence; however, all end point samples will not achieve the preferred Track 1 Unrestricted Use SCOs.

Under both remedial alternatives, dust will be controlled by the on-Site application of water spray as needed and the truck inspection station to avoid off-Site tracking of soil. Engineering controls, such as slowing the pace of work, applying foam and/or dust suppressant, and/or covering portions of the excavation will be used to suppress odors/dust when required. Work will be modified or stopped according to the action levels defined in the CAMP. Short term impacts are similar between Alternative I and Alternative II.

3.3.4 Long-Term Effectiveness and Permanence

Alternative I – A Track 1 remedy will remove all soil exceeding Unrestricted Use SCOs. Groundwater in this area of New York City is not used for drinking water; therefore, the long term effectiveness of this remedy will eliminate risks and satisfy the objectives of this criterion. Because an EE and SMP will not be required for a Track 1 remedy, Article 141 of the NYSDOH code will be relied upon to prevent ingestion of groundwater, which prohibits potable use of groundwater without prior approval. Future Site use will be unrestricted; therefore, the long-term effectiveness of this remedy will eliminate environmental risks and satisfy the objectives of this criterion.

Alternative II – A Track 2 remedy will remove all source media soils exceeding Restricted Residential RUSCOs in areas where confirmation soil samples exceed the Unrestricted Use SCOs. Groundwater in this area of New York City is not used for drinking water; therefore, the long term effectiveness of this remedy would eliminate risks and satisfy the objectives of this criterion. An EE would be put in place, supported by an SMP, and, if necessary, prohibit ingestion of groundwater, which is also prevented by Article 141 of the NYCDOH code, which prohibits potable use of groundwater without prior approval. The long-term effectiveness of this remedy mitigates environmental risks and satisfy the objectives of this criterion and will only be implemented to the extent the Track 1 Unrestricted Use SCOs cannot be feasibly achieved throughout or in certain locations at the bottom of the excavation.

3.3.5 Reduction of Toxicity, Mobility, and Volume

Both remedial alternatives will permanently and significantly reduce the toxicity, mobility, and volume of contamination through the removal of the vast majority of contaminated fill/soil source material through excavation and off-Site disposal.

3.3.6 Implementability

The implementability of each Alternative presented below is high due to the availability of local contractors, personnel, and equipment suitable to working in a structurally challenging environment due to the frequency of this type of remediation in this region.

<u>Alternative I</u> – The Track 1 remedy will consist primarily of excavation and backfilling with standard bucket excavators. If deeper contamination above Unrestricted Use SCOs is encountered below proposed remedial excavation depths and requires over-excavation to achieve a Track 1 cleanup, the additional costs and delays incurred to complete a Track 1 cleanup will have to be evaluated to determine if it is practical at the additional depths that may be required to achieve Track 1. Also to be considered will be the type of equipment, location of the contamination exceeding Track 1 Unrestricted Use SCOs, design of the SOE, necessity of dewatering, and the risk of subsidence of adjacent properties. Additional coordination between trades may be required. This alternative is considered feasible.

<u>Alternative II</u> – The technical feasibility of implementing the Track 2 Alternative II remedy is similar to that of Alternative I, as the same extent of excavation will be required in an attempt to achieve the Track 1 Unrestricted Use SCOs; however, achieving Track 1 Unrestricted Use SCOs may not be possible under this Alternative given the factors that will have to be evaluated once the end point samples can be obtained. Additional coordination between trades may be required, however, this alternative is considered feasible.

3.3.7 Cost Effectiveness

Alternative I – Based on the assumptions detailed for Alternative I, the estimated remediation cost of a Track 1 Cleanup is about $13.2 million. This Alternative I is the cost effective option because it remedies the contamination on-Site in most economically and technically feasible manner to the highest level cleanup given the very deep historic fill soils at the Site and does not require long-term monitoring of institutional controls. Table 5 details the individual cost components used to arrive at this cost estimate.

Alternative II – Based on the assumptions detailed for Alternative II, the estimated remediation cost of a Track 2 Cleanup is about $13.31 million. The excavation cost for this alternative is similar to Alterative I; however, some contamination will be left in place above the Track 1 Unrestricted Use SCOs, which would require the implementation of institutional controls and long-term monitoring. Table 6 details the individual cost components used to arrive at this cost estimate.

3.3.8 Community Acceptance

Both remedial Alternatives are expected to be acceptable to the community because the potential exposure pathways to on-Site contamination will be addressed upon completion of the respective remedies. The proposed development is part of a master planned community that will include affordable housing, senior/supportive housing, community spaces, a performing arts center, a school, a grocery store and local retail, open space, parking and the CCC. The end-use of the Site will provide new community spaces and services, and affordable and attractive residential spaces on a currently contaminated brownfield parcel. The selected remedy will be subject to a 45-day public comment period and will incorporate substantive public comments before being approved.

3.3.9 Land Use

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with either of the Alternatives.

3.4 Selection of Preferred Remedy

Both alternatives will be protective of human health and the environment and meet the remedy selection criteria. Alternative II achieves all of the remedial action goals established for the redevelopment project, effectively reduces contaminant mobility, and is effective in the reduction of contaminant toxicity and volume. However, Alternative I is more preferable if it can be achieved since the more stringent Track 1 Unrestricted Use SCOs will be achieved. Therefore, the preferred remedy will be the Track 1 Alternative I remedy if it can be achieved Site-wide. It is also possible that portions of the Site will achieve the Track 2 Restricted Residential RUSCOs while other portion of the Site will remain Track 1 resulting in a split Track 1/2 remedy. Alternative II or an ultimately-split Track 1/2 remedy, would require some long-term Site management including ICs such as the SMP and EE.

Alternative I is recommended over Alternative II if it can be feasibly and practically implemented Site-wide at a similar cost while resulting in slightly less residual contamination and thus providing greater overall protection to human health and the environment. However, Alternative II is similarly protective of human health and the environment since the residual contamination left after completion of the remedial excavation would remain at least 15 feet bgs and up to 23.5 feet bgs and be located under the proposed new building, which is unlikely to be encountered or excavated again in the future. The controls should be easily implementable long term pursuant to an SMP and EE, which runs with the land. Alternative I is the selected remedy. Figure 7 depicts the Alternative I cleanup plan.

3.4.1 Zoning

According to the New York City Planning Commission Zoning Map 17d dated 24 February 2022, the Site is currently zoned by the New York City Department of City Planning as R5 Infill, which is identified as a residential district that allows for a variety of residential housing. The Volunteer has initiated a re-zoning action that will be consistent with the proposed redevelopment and, when approved, the resulting zoning designation will be a R7-2 with a commercial overlay, which allows for the development of 100% income-based affordable housing and higher density buildings than currently permitted within the R5 zoning designation. The proposed zoning change diagram was certified on 9 May 2022.

3.4.2 Surrounding Property Uses

The surrounding land uses include commercial, industrial, and automotive uses to the north, residential properties to the east and south, and parking lots and the CCC building to the west.

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy.

3.4.3 Citizen Participation

The CPP has been implemented throughout the course of the project and is further discussed in Section 4.1.9.

3.4.4 Environmental Justice Concerns

The Site is located in an Environmental Justice area. NYSDEC's Office of Environmental Justice acts as an advocate on behalf of these areas, which are disproportionately affected by environmental burdens. Construction and operation of the future building will provide new employment opportunities and affordable housing to the area.

3.4.5 Land Use Designations

There are no federal or state land use designations.

3.4.6 Population Growth Patterns

The population growth patterns and projections support the proposed land use.

3.4.7 Accessibility to Existing Infrastructure

The Site currently consists of a vacant gravel lot. Upon completion of the proposed development, water and sewer service will be provided by NYC water and sewer utilities, and electric and natural gas services will be supplied by Consolidated Edison. The property is nearby New York City subway and bus routes.

3.4.8 Proximity to Cultural Resources

No City Landmarks were identified located within 0.5 mile of the Site.

3.4.9 Proximity to Natural Resources

Langan reviewed United States Fish and Wildlife National Wetland Inventory (NWI) and New York State Freshwater Wetlands maps. Based on these documents, no mapped wetlands are listed on the subject property. The nearest wetlands are the Fresh Creek Basin (Estuarine and Marine Deepwater habitat), located approximately 1,400 feet to the southwest of the Site.

3.4.10 Off Site Groundwater Impacts

Municipal water supply wells are not present in this area of New York City; therefore, groundwater from the Site cannot affect municipal water supply wells or recharge areas.

3.4.11 Proximity to Flood Plains

According to the National Flood Insurance Rate map for the City of New York published by the FEMA (Community Panel No. 3604970219F, effective date September 5, 2007), the Site is located in Zone X, which is designated for areas determined to be outside the 0.2% annual chance of flood and in an area of minimal flood hazard.

3.4.12 Geography and Geology of the Site

The Site geology is described in Section 2.2 of this report.

3.4.13 Current Institutional Controls

The Site does not have any institutional controls.

3.5 Summary of Selected Remedial Actions

Alternative I, a Track 1 Unrestricted Use cleanup utilizing the NYSDEC Unrestricted Use SCOs, will include the following tasks:

- Development and implementation of a CHASP and CAMP for the protection of on-Site workers, community/residents, and the environment during remediation and construction activities.
- Construction of the support of excavation (SOE) system to facilitate the Track 1 remediation.
- Dewatering in compliance with city, state, and federal laws and regulations. Extracted groundwater will be managed under a permit from NYCDEP/NYSDEC that will be required to meet effluent limitations prior to discharge to the sewer system.
- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations.
- Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work.
- Excavation, stockpiling, off-Site transport, and disposal of soil that exceeds Unrestricted Use SCOs as defined by 6 NYCRR Part 375-6.8, and as needed for the remediation as follows:
    - The entire Site footprint will be excavated from ground surface to between 15 and 20 feet bgs to remove known elevated concentrations of SVOCs, metals, PCBs, and pesticides exceeding the Unrestricted Use SCOs at various locations throughout the Site footprint.
        - Approximately 18,550 square feet (approximately 27% of the Site footprint) will be excavated to 15 feet below existing grade.
        - Approximately 22,850 square feet (approximately 33% of the Site footprint) will be excavated to 16 feet below existing grade.

    - Approximately 27,075 square feet (approximately 40% of the Site footprint) will be excavated to 20 feet below existing grade.
  - Additional 15- by 15-foot hotpot excavations to remove elevated concentrations of metals, PCBs, and pesticides above the Unrestricted Use SCOs will be completed throughout the site footprint as follows:
    - One hotspot centered on LSB-22 will be excavated from the base of the 15-foot mass remedial excavation to approximately 16 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
    - One hotspot centered on LSB-20 will be excavated from the base of the 16-foot mass remedial excavation to approximately 18 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
    - One hotspot centered on LSB-18 will be excavated from the base of the 16-foot mass remedial excavation to approximately 19.5 feet bgs for the remediation of metals at concentrations above the Unrestricted Use SCOs.
    - One hotspot centered on LSB-19 will be excavated from the base of the 20-foot mass remedial excavation to approximately 21 feet bgs for the remediation of metals and PCBs at concentrations above the Unrestricted Use SCOs.
    - One hotspot centered on LSB-16 will be excavated from the base of the 20-foot mass remedial excavation to approximately 22.5 feet bgs for the remediation of metals and PCBs at concentrations above the Unrestricted Use SCOs.
    - One hotspot centered on LSB-26 will be excavated from the base of the 20-foot mass remedial excavation to approximately 23.5 feet bgs for the remediation of metals and pesticides at concentrations above the Unrestricted Use SCOs.
- Appropriate off-Site disposal of material removed from the Site in accordance with federal, state and local rules and regulations for handling, transport, and disposal.

- Removal and decommissioning of any encountered USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and disposal off-Site during Site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Collection and analysis of confirmation soil samples from the excavation base, in accordance with DER-10 to confirm Track 1 SCOs were achieved; over-excavation may be completed if feasible to meet the Unrestricted Use SCOs.
- Importation and backfilling of remediated areas, as necessary for development, with certified-clean material (meeting Track 1 SCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone to backfill areas excavated deeper than the development depth.
- Installation of a vapor barrier/waterproofing membrane below the slab of the proposed building and along sidewalls of any subgrade foundation elements beneath occupied spaces as a green remediation component.
- All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

Remedial activities will be completed in accordance with this RAWP and the Department-issued Decision Document. Deviations from the RAWP and/or Decision Document will be promptly reported to the NYSDEC for approval and explained in the FER.

4.0 REMEDIAL ACTION PROGRAM

4.1 Governing Documents

The primary documents governing the remedial action are summarized in this section. Where referenced, copies of the full plan are provided in the appendices.

4.1.1 Standards, Criteria and Guidance

The following standards, criteria, and guidance are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response
- 6 NYCRR Part 371 – Identification and Listing of Hazardous Wastes

- 6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 373-4 – Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators
- 6 NYCRR Subpart 374-1 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 6 NYCRR Subpart 374-3 – Standards for Universal Waste
- 6 NYCRR Part 375 – Environmental Remediation Programs
- 6 NYCRR Part 376 – Land Disposal Restrictions
- 6 NYCRR Part 750 –SPDES Permits
- CP-43 – CP on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-51 – Soil Cleanup Guidance (2010)
- DER-10 – Technical Guidance for Site Investigation and Remediation (May 3, 2010)
- DER-23 – Citizen Participation Handbook for Remedial Programs (March, 2010)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006)
- TOGS 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations
- Sampling, Analysis, and Assessment of PFAS Under NYSDEC's Part 375 Remedial Programs (April 2023)
- USEPA OSWER Directive 9200.4-17 – Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997)
- Screening and Assessment of Contaminated Sediment (Division of Fish, Wildlife and Marine Resources, June 2014)

4.1.2 Site Specific Construction Health & Safety Plan

The Remediation Engineer (RE) prepared a Site-specific construction HASP (CHASP), which is included as Appendix D. The CHASP will address Site-specific contaminants and will apply only to remedial and construction-related work on-Site. Contractors operating on the Site are required to adhere to their own plans that, at a minimum, meet the requirements of the CHASP. Remedial work performed under this plan will be in compliance with governmental requirements, including Site and worker safety requirements mandated by the Federal Occupational Safety and Health Administration (OSHA). The CHASP provides a mechanism for establishing on-Site safe working conditions, safety organization, procedures, and PPE requirements during implementation of the remedy. The CHASP meets the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65). The CHASP includes, but is not limited to, the following components:

- Organization and identification of key personnel
- Training requirements
- Medical surveillance requirements
- List of Site hazards
- Excavation safety
- Work zone descriptions
- Personal safety equipment and protective clothing requirements
- Decontamination requirements
- Standard operating procedures
- Protective measure plan
- CAMP
- Safety Data Sheets

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work are responsible for the preparation of an appropriate CHASP and for the appropriate performance of work according to that plan and applicable laws.

The CHASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion. The Langan Site Safety Coordinator will be Lauren Kott. If required for Site workers, confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses. Langan personnel will not enter confined spaces.

4.1.3 Quality Assurance Project Plan

The RE has prepared a Quality Assurance Project Plan (QAPP) that describes the quality control components that will ensure that the proposed remedy accomplishes the remedial goals, remedial action objectives, and is completed in accordance with the design specifications. The QAPP is provided as Appendix E and includes:

- Responsibilities of key personnel and their organizations for the proposed remedy;
- Qualifications of the quality assurance officer;
- Sampling requirements including methodologies, quantity, volume, locations, frequency, acceptance and rejection criteria; and
- Description of the reporting requirements for quality assurance activities including weekly quality assurance review reports, periodic quality assurance and quality control audits, and other report and data submissions.

4.1.4 Construction Quality Assurance Plan

The RE has prepared a Construction Quality Assurance Plan (CQAP) that describes the quality control components that will ensure that the proposed remedy accomplishes the remedial goals, remedial action objectives, and is completed in accordance with the design specifications. Because the remedy is being accomplished through building construction, the contractor and construction manager will have the primary responsibility to provide construction quality. A list of engineering personnel involved in implementation of the CQAP and procedures that will be carried out by the remedial engineering team are identified below. Project personnel resumes are provided in Appendix F.

The following project personnel are anticipated to implement the RAWP.

Remediation Engineer (RE):	Ronald D. Boyer, P.E.
Project Manager:	Amanda Forsburg, CHMM
Langan Health & Safety Officer:	Tony Moffa, ASP, CHMM, COSS
Langan Site Safety Coordinator:	Lauren Kott, P.E.
Qualified Environmental Professional (QEP):	Amanda Forsburg, CHMM
Field Team Leader:	Lauren Kott, P.E.
Quality Assurance Officer:	Joe Conboy

The QEP or RE will directly supervise field engineers, scientists, and geologists that will be on Site during the remedial action to monitor particulates and organic vapor in accordance with the CAMP. Daily reports will be submitted to the NYSDEC and NYSDOH and will include reporting of any CAMP results that exceed the specified action levels.

The QEP or RE will directly supervise field engineers, scientists, and geologists who will meet with the Construction Superintendent on a daily basis to discuss the plans for that day and schedule upcoming activities. The field engineer/scientist/geologist will document remedial activities in the daily report. This document will be forwarded to the Field Team Leader on a daily basis and to the Project Manager and the RE on a weekly basis.

The QEP or RE will directly supervise field engineers, scientists and geologists who will screen the excavation with a PID during intrusive activities. PID readings will be noted in the record. PID readings that exceed action levels will be reported to the NYSDEC and NYSDOH in the daily reports. The field engineer/scientist/geologist will collect the post-excavation soil samples in accordance with this RAWP.

A photo log will be kept to document construction activities by still photos. The photo log may also be used to record activities recorded in the daily report.

The project field book will be used to document sample collection and how it corresponds to the RAWP. Observations, field and/or laboratory tests will be recorded in the project field book or on separate logs. Recorded field observations may take the form of notes, charts, sketches, or photographs.

The Field Team Leader will maintain the current field book and original field paperwork during the performance of work. The Project Manager will maintain the field paperwork after completion and will maintain all submittal document files.

4.1.5 Soil/Materials Management Plan

The RE has prepared a Soil/Materials Management Plan (SMMP), which includes detailed plans for managing soil/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal. It also includes controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with applicable federal, state and local laws and regulations. The SMMP is further described in Section 5.4.

4.1.6 Erosion and Sediment Control Plan

Where needed, silt fencing or hay bales will be installed around the perimeter of the remediation area in compliance with a NYSDEC-approved and NYCDEP-approved SWPPP. Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of silt fence toe anchors shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the RAWP shall be observed to ensure that they are operating correctly. 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.

4.1.7 Community Air Monitoring Program

A CAMP was prepared for the Site as part of the CHASP (Appendix D), and is further discussed in Section 5.4.12.

4.1.8 Contractor's Site Operations Plan

The RE will review plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and will confirm that the plans and submittals are in compliance with this RAWP. The RE is responsible for documenting that contractor and sub-contractor submittals for this remedial project are in compliance with this RAWP. Remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work associated with the remedial document.

4.1.9 Citizen Participation Plan

Fact Sheets describing the Remedial Action proposed in the RAWP will be distributed through DEC Delivers, the NYSDEC's email listserv service and online Environmental Notice Bulletin. Additional Fact Sheets will be distributed to parties on the Site Contact List to announce: 1) a 45-day comment period for this RAWP; 2) the completion of the Remedial Action once implemented, with a summary of the FER; and, 3) the issuance of the Certificate of Completion for the Site.

No changes will be made to the approved Fact Sheets without written consent of the NYSDEC. Other information, such as brochures and flyers, will not be included with the Fact Sheet mailing. The CPP for this project is included in Appendix G.

Document repositories have been established at the following locations and contain all applicable project documents:

Borough of Brooklyn, Community Board 5
AT Mitchell, Chairperson
127 Pennsylvania Avenue, 2nd Floor
Brooklyn, NY 11207
Email: mperkins@cb.nyc.gov
Website: https://www.broooklyncb5.org/

Brooklyn Public Library
Spring Creek Branch
12143 Flatlands Avenue
Brooklyn, NY 11207
Phone: (718) 257-6571
Hours (Call to verify):

Monday, Wednesday, Friday	10:00 a.m. to 6:00 p.m.
Tuesday	1:00 p.m. to 8:00 p.m.
Thursday	10:00 p.m. to 8:00 p.m.
Saturday	10:00 a.m. to 5:00 p.m.
Sunday	Closed

Documents will also be posted on the NYSDEC DECinfo Locator website (https://www.dec.ny.gov/data/DecDocs/C224290/)).

4.1.10 Remedial Design and Green Remediation Principles

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and Site management of the remedy as per DER-31. The major green remediation components are as follows:

- Installation of a vapor barrier/waterproofing membrane below the slab of the proposed building and along sidewalls of any subgrade foundation elements beneath occupied spaces as a green remediation component

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term
- Reducing direct and indirect greenhouse gases and other emissions
- Increasing energy efficiency and minimizing use of non-renewable energy
- Conserving and efficiently managing resources and materials
- Reducing waste, increasing recycling and increasing reuse of materials that would otherwise be considered a waste
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development

4.2 General Remedial Construction Information

4.2.1 Project Organization

This section presents the anticipated project organization and associated roles, including key personnel, descriptions of duties, and lines of authority in the management of the RAWP. Information regarding the organization/personnel and their associated responsibilities is provided below. Resumes of key personnel involved in the Remedial Action are included in Appendix F.

4.2.2 Remedial Engineer

The RE for this project will be Ronald D. Boyer, P.E. The RE is a registered professional engineer licensed by the State of New York. The RE will have primary direct responsibility for implementation of the remedial program for the 12096 Flatlands Avenue Site. The RE will certify in the FER that the remedial activities were observed by Langan personnel under his supervision and that the remediation requirements set forth in the RAWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with the RAWP.

The RE will document the work of other contractors and subcontractors involved in aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, and implementation, construction of ECs, emergency spill response services, import of backfill material, and management of waste transport and disposal. The RE will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The RE will review pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the FER. The RE will provide the certifications listed in the FER.

4.2.3 Remedial Action Construction Schedule

The remedial action construction schedule is discussed below in Section 11 and is provided in Appendix H. The NYSDEC will be promptly notified of proposed changes, delays and/or deviations to the schedule.

4.2.4 Work Hours

The hours for operation of remedial construction will conform to the New York City Department of Buildings (NYCDOB) construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Volunteer of any variances issued by the NYCDOB. NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 Site Security

The Site perimeter will be secured with gated, signed, plywood fencing with points of entry and exit in accordance with NYCDOB and New York City Department of Transportation (NYCDOT) permits and requirements. The purpose of the fencing is to limit Site access to authorized personnel, protect pedestrians from Site activities, and maintain Site security.

4.2.6 Traffic Control

Site traffic will be controlled through designated points of access. Access points will be continuously monitored and if necessary, a flagging system will be used to protect workers, pedestrians and authorized guests. Traffic will also adhere to applicable local, state, and federal laws.

4.2.7 Contingency Plan

Contingency plans, as described below, have been developed to effectively deal with unexpected discoveries of additional contaminated media or USTs.

4.2.8 Discovery of Additional USTs

As a contingency, if an unknown UST is discovered via exploratory test pit or excavation, it will be decommissioned in accordance with 6 NYCRR Part 612.2 and 613.9, and DER-10 Section 5.5. Once the tank and its contents are removed, post-excavation soil samples will be collected per the NYSDEC DER-10 requirements, if deemed necessary by the NYSDEC and the RE. Post-excavation soil sampling is not expected where the excavation will extend below the UST, as discussed in Section 5.2.1, below. If encountered, petroleum-contaminated soils will be removed. UST closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, will be provided as appendices in the FER. The NYSDEC Petroleum Bulk Storage (PBS) registration will be updated as necessary, depending on the type, number, and capacity of discovered tanks.

4.2.9 Discovery of Additional Contaminated Soil

During remediation and construction activities, the soil will be continuously monitored by the RE's field representatives using a PID as well as visual and olfactory field screening techniques to identify additional soil that may not be suitable for the selected disposal facility(ies). If discovered, this material will be segregated and sampled in accordance with disposal facility requirements. If the facility is not permitted to receive the suspect materials, the material will be disposed of off-Site at a permitted facility able to receive the material based on the characterization data.

Identification of unknown or unexpected contaminated media identified by screening during ground-intrusive Site work will be promptly communicated by phone and email to the NYSDEC Project Manager. These findings will be detailed in the daily reports and the subsequent monthly BCP progress report.

4.2.10 Worker Training and Monitoring

Worker training and monitoring will be conducted in accordance with the Site-specific CHASP, included as Appendix D.

4.2.11 Agency Approvals

The planned end use for the Site conforms to current zoning for the property as determined by New York City Department of Planning. A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

4.2.12 Pre-Construction Meeting with NYSDEC

Prior to the onset of construction, a meeting will be held between the NYSDEC, QEP and/or RE, Volunteer, Construction Manager, and Contractor to discuss project roles, responsibilities, and expectations associated with the NYSDEC-approved RAWP. Notice will be provided to the NYSDEC seven days prior to Site mobilization.

4.2.13 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in the CHASP. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

4.2.14 Remedial Action Costs

The estimated cost of the Track 1 Remedial Action is $13.2 million. An itemized and detailed summary of estimated costs for the remedy is provided in Table 5.

4.3 Site Preparation

4.3.1 Mobilization

Prior to commencing the remedial excavation and groundwater treatment activities, the Remediation Contractor will mobilize to the Site and prepare for remedial activities. Descriptions of mobilization and Site preparation activities may include the following:

- Identifying the location of all aboveground and underground utilities (e.g., power, gas, water, sewer, communications), equipment, and structures (as necessary to implement the remediation);
- Mobilizing necessary remediation personnel, equipment, and materials to the Site;
- Constructing one or more stabilized construction entrances consisting of nonhazardous material capped with a gravel roadway at or near the Site exit, which takes into consideration the Site setting and Site perimeter, in accordance with Section 4.3.4;
- Constructing an equipment decontamination pad for trucks, equipment, and personnel that come into contact with impacted materials during remedial activities;
- Installing erosion and sedimentation control measures, as necessary; and,
- Installing temporary fencing or other temporary barriers to limit unauthorized access to areas where remediation activities will be conducted.

4.3.2 Erosion and Sedimentation Controls

As detailed in Section 4.1.6, silt fencing or hay bales will be installed around the perimeter of the remediation area in compliance with a NYSDEC-approved and NYCDEP-approved SWPPP. Best management practices for soil erosion will be selected and implemented, as needed, to minimize erosion and sedimentation off Site.

4.3.3 Monitoring Well Decommissioning

Existing groundwater monitoring wells will be properly decommissioned in accordance with NYSDEC policy CP-43 Groundwater Monitoring Well Decommissioning Policy or during excavation as part of future foundation construction.

4.3.4 Temporary Gravel Construction Entrance(s)

A temporary gravel construction entrance and exit will be installed on-Site for all vehicles exiting the BCP Site. The entrances will be covered with gravel or RCA and graded so that runoff water will be directed back into the Site. Vehicles exiting construction areas will be cleaned using clean water or dry brushing, as needed, to remove Site soil from the tires and undercarriages in accordance with Section 4.3.8. The Contractor will protect and maintain the sidewalks and roadway at Site access and existing points.

4.3.5 Utility Marker and Easements Layout

The Volunteer and its contractors are responsible for identifying utilities that might be affected by the remedial work and implementation of all required, appropriate, or necessary health and safety measures under this RAWP. The Volunteer and its contractors are responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors must obtain any local, state, or federal permits or approvals pertinent to such work that may be required to implement this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the Site has been investigated. It has been determined that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on the Site.

4.3.6 Support-of-Excavation

Appropriate management of structural stability of on-Site or off-Site structures during remedial activities, including excavation, is the responsibility of the Volunteer and its contractors. The Volunteer and its contractors are solely responsible for safe execution of work performed under this RAWP. The Volunteer and its contractors must obtain the necessary local, state, or federal permits or approvals that may be required to perform work under this RAWP. Further, the Volunteer and its contractors are responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 Equipment and Material Staging

The Contractor will notify the RE and the Volunteer, in writing with receipt confirmed, of pending Site mobilization at least 30 calendar days in advance. During mobilization, construction equipment will be delivered to the Site, temporary facilities constructed, and temporary utilities installed. The Contractor will place and maintain temporary toilet facilities within the work areas for use by all Site personnel. The contractor will provide drinking water for all Site personnel.

4.3.8 Truck Wash and Inspection Station

An outbound-truck inspection station will be set up at or near the Site exit. Before exiting the Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. If observed, soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary. The Contractor is responsible for collecting any soil that is inadvertently tracked immediately off Site and returning the soil to the Site.

4.3.9 Site Fencing

The Site perimeter will be secured with gated, signed, plywood fencing. The purpose of the fencing is to limit Site access to authorized personnel, protect pedestrians from Site activities, minimize construction noise, and maintain Site security.

4.3.10 Demobilization

After remediation and construction is completed, the Contractor will be responsible for demobilizing labor, equipment, and materials not designated for off-Site disposal. The RE will document that the Contractor performs follow-up coordination and maintenance for the following activities:

- Removal of sediment and erosion control measures and disposal of materials in accordance with applicable rules and regulations
- Removal of remaining contaminated material or waste
- Equipment decontamination
- General refuse disposal

4.4 Reporting

Periodic reports and an FER will be submitted to the NYSDEC as required to document the remedial action. The Project RE responsible for certifying all reports will be an individual licensed to practice engineering in the State of New York. Ronald D. Boyer, P.E. of Langan, will have this responsibility. Should Mr. Boyer become unable to fulfill this responsibility, another suitably qualified Professional Engineer will take his place.

Daily and monthly reports will be included as appendices to the FER. In addition to the periodic reports and the FER, copies of the relevant contractor documents will be submitted to the NYSDEC.

4.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers during on-Site remedial construction activities by the end of each day following the reporting period and will include:

- An update of progress made during the reporting day
- Locations of work and quantities of material imported and exported from the Site
- References to an alpha-numeric map for Site activities
- A summary of complaints with relevant details (names, phone numbers)
- A summary of CAMP findings, including trigger action levels, and
- An explanation of notable Site conditions

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information; however, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily Reports will reference the NYSDEC-assigned project number and include a description of daily activities keyed to an alpha-numeric map that identifies work areas. These reports will include a summary of air monitoring results, odor and dust problems and corrective actions, and complaints received from the public.

4.4.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of the month following the reporting period and will include the following information, as well as the information required in the BCA:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (e.g., tons of material exported and imported)
- Description of approved activity modifications, including changes of work scope and/or schedule
- Sampling results received following internal data review and validation, as applicable
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays

4.4.3 Other Reporting

Photographs of remedial activities will be taken and submitted to the NYSDEC. Photographs will illustrate the remedial program elements and will be of acceptable quality. Representative photographs of the Site will be provided. Field photographs will be included in daily and monthly reports, as necessary, and a comprehensive photograph log will be included in the FER. Upon request, photographs will be submitted to the NYSDEC and NYSDOH Project Managers on CD or other acceptable electronic media. CDs will have a label and a general file inventory structure that separates photographs into directories and sub-directories according to logical Remedial Action components. A photograph log keyed to photo file ID numbers will be prepared to provide explanation for all representative photographs.

Site record keeping for all remedial work will be appropriately documented. These records will be maintained on Site at all times during the project and will be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 Complaint Management Plan

The management plan for documenting complaints is detailed below.

Item	Description
Approach	Complaints regarding remediation or construction activities/operations to be minimized and mitigation measures implemented to reduce the incidence of complaints.
Objective	To manage environmental complaints from the community regarding construction or remediation.
Implementation Strategy/Mitigation Measures	All complaints will be documented on a complaint register. The register will be maintained as an ongoing record. The entry will include following information: • Time, date and nature of complaint; • Type of communication (telephone, letter, personal, etc.); • Name, contact address and contact number; • Response and investigation undertaken as a result of the complaint; and action taken and signature of responsible person. Each complaint will be investigated as soon as practical in relation to requirements.
Monitoring	A representative of the Volunteers or the RE will follow up on the complaint within two weeks of receipt to ensure it is resolved.
Reporting	Upon receipt and following the complaint investigation and resolution, the NYSDEC will be notified. Complaint resolutions will be documented in daily reports.
Corrective Action	Should an incident or failure to comply occur in relation to the management of environmental complaints, one or more of the following corrective actions will be undertaken as appropriate: • Conduct additional training of staff to handle environmental complaints • Investigate why the environmental complaint was not addressed within the specified time frame • Investigate complaint and action follow-up to results of investigation

4.4.5 Deviations from the RAWP

Necessary deviations from the RAWP will be coordinated with the NYSDEC in advance. Notification will be provided to the NYSDEC by telephone/email for conditions requiring immediate action (e.g., conditions judged to be a danger to the surrounding community). Based on the significance of the deviation, an addendum to this RAWP may be necessary and will include:

- Reasons for deviating from the approved RAWP
- Approval process to be followed for changes/editions to the RAWP
- Effect of the deviations on the overall remedy

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

5.1 Soil Cleanup Objectives

The Soil Cleanup Objectives for the Site are the Unrestricted Use SCOs; SCOs for the selected remedy are listed in Table 4.

Soil and materials management on-Site and off-Site will be conducted in accordance with the SMMP as described below.

5.2 Remedial Performance Evaluation (Confirmation Sampling)

5.2.1 Confirmation Sampling Frequency

Confirmation soil samples will be collected from the excavation base at a frequency of one per 5,000 square feet based on the following:

- The proposed remedy includes excavation and off-Site disposal of all soil exceeding the Track 1 Unrestricted Use SCOs as defined by 6 NYCRR Part 375-6.8(a) to a depth between 15 and 23.5 feet bgs.
- The Site contaminants of concern in soil are primarily related to the presence of contaminated fill, in which exceedances of the Unrestricted Use SCOs are present between 15 and 23.5 feet bgs.
- The Site covers an area of approximately 1.5 acres (about 68,435 square feet).

Based on the proposed reduced sampling frequency, an estimated 14 confirmation soil samples, plus QA/QC samples, will be collected to verify performance of the remedy. Six of the confirmation soil samples will be biased to the locations of LSB-16, LSB-18, LSB-19, LSB-20, LSB-22, and LSB-26 to document the removal of metals, PCBs, and/or pesticides exceeding the Unrestricted Use SCOs.

Sidewall samples will not be collected from the site perimeter because excavation will extend across the site footprint and SOE measures (e.g., sheeting and lagging) will preclude access to soil sidewalls. If endpoint samples reveal elevated concentrations of compounds above the Unrestricted Use SCOs and over-excavation is required to achieve a Track 1 cleanup, over-excavation and additional endpoint sample collection may be implemented. As such, the number of samples may change based on over-excavation needs.

In the event previously unknown hotspot removal is required, one base sample and one sidewall soil sample for every 30 linear feet of sidewall will be collected for those areas. In the location of the suspected UST(s) or unidentified USTs, if the remedial or development excavation depth does not extend beyond the bottom of the encountered tank, five documentation samples will be collected from each excavation and will consist of one sample per excavation sidewall and a sample from each excavation base. As necessary, post removal soil samples will be collected in accordance with the requirements of CP-51. Samples will be analyzed for CP-51 List VOCs and SVOCs and compared to the CP-51 Table 2 Soil Cleanup Levels for Gasoline Contaminated Soils or Table 3 Soil Cleanup Levels for Fuel Oil Contaminated Soil and the 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs, depending on the contents of the USTs. If the remedial or development excavation depth does extend beyond the bottom of the encountered tank, a post-excavation base confirmation soil sample will be biased to the tank's location when collected upon completion of Site excavation.

5.2.2 Methodology

Confirmation soil samples will be collected from the surface of soil remaining in place between approximately 15 and 23.5 feet below existing site grade immediately prior to construction of the foundation slab or imported backfill to raise site grade to development depth to verify performance of the remedy and will be analyzed for the Part 375 list of VOCs, SVOCs, PCBs, herbicides, pesticides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane. Should additional soil sampling be deemed necessary (e.g., additional tank closure, unknown environmental condition through visual evidence of a remaining source), confirmation sampling will be conducted in accordance with NYSDEC DER-10 and the protocol described above. NYSDEC ASP Category B deliverables will be requested from the laboratory for data validation purposes

Should the confirmation soil sample results exceed the Unrestricted Use SCOs, over-excavation and additional confirmation soil sampling may be implemented. If no further excavation is completed, then the confirmation sample will be identified as a documentation sample and will be used to evaluate soil to remain in place after the development. No off-Site excavation is required.

5.2.3 Quality Assurance/Quality Control Plan

Quality control procedures for confirmation soil sampling are included in the QAPP (refer to Appendix E). Confirmation analytical results will be provided in the NYSDEC's electronic data deliverable (EDD) format for EQuIS™. Guidance on the sampling frequency is presented in NYSDEC DER-10 Section 5.4.

The QA/QC procedures required by the NYSDEC Analytical Services Protocol (ASP) and SW-846 methods will be followed. This will include instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of quality control samples. The laboratory will provide sample bottles, which will be pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP will take precedence.

5.2.4 Data Usability Summary Reports

ASP Category B deliverables will be prepared for all remedial performance samples collected during implementation of this RAWP. Data Usability Summary Reports (DUSR) will be prepared by a qualified data validator and the findings will be reported in the FER.

5.2.5 Confirmation Sampling Reporting

Analytical laboratories that analyze confirmation soil samples, prepare results, and perform contingency sampling will be NYSDOH ELAP-certified laboratories. Confirmation and endpoint soil sampling will be performed in accordance with frequency described above. The FER will provide a tabular and map summary of all endpoint soil sample results with a comparison to the Unrestricted Use SCOs and/or Restricted Residential RUSCOs. Soil samples with concentrations of contaminants above the Unrestricted Use SCOs and/or Restricted Residential RUSCOs, if any, will be identified.

5.3 Estimated Material Removal and Backfill Quantities

The estimated volume of soil requiring removal and off-Site disposal for the Track 1 remedy is up to about 44,000 cubic yards. Backfilling to return the excavated area to development grade for construction of the utility vaults and stormwater detention tank area in the northwestern portion of the Site following completion of the remedial excavation is anticipated. Up to an additional 2,000 cubic yards of backfill would be required to backfill this area to development grade upon completion of the Track 1 remediation. Backfill that meets the Unrestricted Use SCOs and the requirements outlined in Section 3.2.4 will be imported to the Site.

5.4 Soil/Materials Management Plan

This section presents the approach to management, disposal, and reuse of soil, fill, and materials excavated from the Site. This plan is based on the current knowledge of Site conditions and will be augmented, as necessary, using additional data collected during remediation. A field engineer, scientist, or geologist, under the direction of the RE will monitor and document the handling and transport of contaminated material removed from the Site for disposal as a regulated solid waste. A field engineer, scientist, or geologist, under the direction of the RE, will assist the remediation contractor in identifying impacted materials during remediation, determining materials suitable for direct load out versus temporary on-Site stockpiling, selection of samples for waste characterization, if necessary, and determining the proper off-Site disposal facility. Separate stockpile areas will be constructed as needed for the various materials to be excavated or generated, with the intent to most efficiently manage and characterize the materials and to avoid comingling impacted materials with non-impacted soil.

The following material types are reasonably anticipated to be encountered during remediation and other Site activities associated with redevelopment:

- Non-hazardous Contaminated Fill Material – This material refers to fill that contains contaminants above the Unrestricted Use SCOs and will not be reused on-Site. This material will be excavated to between approximately 15 and 20 feet bgs across the entire Site footprint. This material will be transported off-Site and disposed of at a facility permitted to accept the material. Additional material will be excavated at six 15- by 15-foot hotspot excavations centered on LSB-16, LSB-18, LSB-19, LSB-20, LSB-22, and LSB-26 that will be completed to 16 to 23.5 feet bgs from the base of the corresponding mass remedial excavation to remove RI samples with analytical results exceeding the Track 1 SCOs.

5.4.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed by an engineer, geologist, or scientist under the direct supervision of a PE or QEP during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of the time of year that invasive work is conducted and will take place during excavation and invasive work performed as part of the remedy and development-related construction performed prior to issuance of the Certificate of Completion, including, but not limited to, excavating for remediation, foundation construction, and utility work.

Screening will be performed by an engineer, geologist, or scientist under the direct supervision of a PE or QEP. Resumes are provided herein for personnel responsible (i.e., those representing the RE) for field screening the excavation and other ground-intrusive work performed during remediation and development.

5.4.2 Stockpile Methods

Stockpiles will be constructed as necessary to separate and stage excavated material pending loading or characterization sampling. Stockpile areas will meet the following minimum requirements:

- Separate stockpile areas will be constructed to avoid comingling materials of differing waste types. Where material of different waste types cannot be otherwise separated, excavated soil will be placed onto a minimum thickness of 6 mil low-permeability liner of sufficient strength and thickness to prevent puncture during use; separate stockpiles will be created where material types are different (e.g., petroleum-impacted material stockpiled in a contaminated soil area). The use of multiple layers of thinner liners is permissible.
- Equipment and procedures will be used to place and remove the soil that will minimize the potential to jeopardize the integrity of the liner.
- Stockpiles located at or above sidewalk grade will be covered at the designated times (see below) with minimum 6-mil plastic sheeting or tarps which will be securely anchored to the ground. Stockpiles will be routinely inspected and broken sheeting covers will be promptly replaced.
- Stockpiles will be covered upon reaching their capacity (i.e., about 1,000 cubic yards) until ready for loading. Stockpiles that have not reached their capacity, whether active or inactive, will be covered at the end of each workday.
- Each stockpile will be encircled with silt fences and hay bales, as needed, to contain and filter particulates from rainwater that has drained off the soils and to mitigate the potential for surface water run-off.
- Stockpiles will be inspected at a minimum of once daily 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.

5.4.3 Materials Excavation and Load Out

A field engineer, scientist, or geologist under the supervision of the RE will monitor ground-intrusive work and the excavation and load-out of excavated material.

The Volunteer and its contractors are solely responsible for safe execution of ground-intrusive and other remedial work performed under this RAWP. The Volunteer and its contractors are solely responsible for the identification of utilities and/or easements that might be affected by the work conducted under this RAWP.

Loaded vehicles leaving the Site will be appropriately lined (as needed), securely covered, manifested, and placarded in accordance with the appropriate federal, state, and local requirements, including applicable transportation requirements (i.e., New York State Department of Transportation [NYSDOT] and NYCDOT requirements). Trucks hauling fill material will not be lined unless free liquids are present or the material is grossly impacted.

A truck wash will be operated on Site. The RE will be responsible for documenting that outbound trucks will be washed at the truck wash, as necessary, before leaving the Site until the remedial construction is complete. Locations where vehicles enter or exit the Site will be inspected daily for evidence of off-Site sediment tracking.

The RE will be responsible for documenting that egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during remediation and development. The remediation contractor will clean adjacent streets as necessary to maintain a clean condition with respect to Site-derived materials.

The Volunteer and associated parties preparing the remedial documents submitted to New York State, and the parties performing this work, are responsible for the safe performance of ground-intrusive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Volunteer and associated parties will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

Development-related excavation will not interfere with, or otherwise impair or compromise, the performance of remediation required by this RAWP.

Mechanical processing of fill and contaminated soil on-Site is prohibited unless otherwise approved by NYSDEC.

Primary contaminant sources (including, but not limited to, tanks and hotspots) identified during Site characterization, the RI, and implementation of the remedy will be located via field measurements to the nearest permanent structures or property lines. The information will be shown on maps to be included with the FER.

5.4.4 Materials Transport Off-Site

Transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. The trucking entrance will be determined prior to the initiation of the remedy. All trucks loaded with Site materials exit the vicinity of the Site using only approved truck routes.

These routes are the most appropriate routes to and from the Site and 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
- Limiting total distance to major highways
- Promoting safety in access to highways
- Overall safety in transport
- Community input (where necessary)

Truck routes are shown on Figure 10. Trucks will be prohibited from excessive stopping and idling in the neighborhood outside of 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.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during remediation and development.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

5.4.5 Materials Disposal Off-Site

Disposal facilities will be determined at a later date and will be reported to the NYSDEC Project Manager prior to off-Site transport and disposal of excavated material. Soil/fill/solid waste excavated and removed from the Site will be handled, transported and disposed in accordance with local, State (including 6 NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (e.g., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval.

The following documentation will be obtained and reported by the RE for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms to applicable laws:

(1) A letter from the RE 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 RE. The letter will include as an attachment a summary of all chemical data for the material being transported (including waste characterization data).

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

These documents will be included in the FER.

Contaminated fill material and soil transported off-Site will be handled, at a minimum, as a solid waste per 6 NYCRR Part 360 and are prohibited from being disposed of at Part 360 Registration Facilities (also known as Soil Recycling Facilities).

Soil that is contaminated but non-hazardous and is being removed from the Site may be sent to a permitted Part 360 landfill. This material is prohibited from being sent or redirected to a Part 360-15 Registration Facility.

The FER will include an accounting of the destination of material removed from the Site during implementation of the remedy, including excavated soil, contaminated soil and fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of each material type must also include records and approvals for receipt of the material. This information will also be presented in a table to be included in the FER.

A "Bill of Lading" system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER. Hazardous wastes derived from the Site will be stored, transported, and disposed of in compliance with applicable local, state, and federal regulations.

Appropriately licensed haulers, in compliance with applicable local, state, and federal regulations, will be used to transport the material removed from this Site.

A waste characterization study will be performed for soil intended for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported in the FER. Data available for excavated material to be disposed of at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

5.4.6 Materials Reuse On-Site

Soil excavated during the remedy may be reused on Site if the requirements in this section are met. Grossly-impacted soil will not be reused. Reused soil must be non-hazardous and must meet the Unrestricted Use SCOs (refer to Table 4). Soil removed during implementation of the remedy or removed for grading or other purposes which meets the Unrestricted Use SCOs may be reused as backfill but will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Site. Material deemed unfit for reuse will be transported for off-Site disposal.

5.4.7 Fluids Management

Dewatering may occur in support of remediation activities.

Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (e.g., a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

5.4.8 Demarcation

It is anticipated that the Site will achieve a Track 1 Unrestricted Use cleanup; therefore, engineering controls for soil, such as a Site cover system and associated demarcation layer, are not proposed. However, a survey denoting the base and sidewalls of the excavation may still be required if analytical results from the confirmation samples are detected exceeding the Unrestricted Use SCOs, because an Environmental Easement will be filed as part of the Track 2 or Split Track 1/2 remedies.

5.4.9 Backfill from Off-Site Sources

Materials proposed for import onto the Site will be approved by the RE and NYSDEC, and will be in compliance with the provisions in this RAWP prior to receipt at the Site. Imported soil for backfill must meet the Unrestricted Use or other acceptable fill material such as virgin stone from a quarry or RCA.

Clean fill will be segregated at a source/facility that is free of environmental contaminants. Qualified environmental personnel will collect representative samples at a frequency consistent with NYSDEC DER-10 Table 5.4(e)10 – Recommended Number of Soil Samples for Soil Imported To or Exported From a Site. The samples will be analyzed for Part 375 VOCs, SVOCs, pesticides/herbicides, PCBs, cyanide, metals including trivalent and hexavalent chromium and PFAS, and 1,4-dioxane by a NYSDOH ELAP-certified laboratory. Upon meeting these criteria, the certified-clean fill will be transported to the Site and segregated from impacted material, as necessary, on plastic sheeting until it is used as backfill.

If RCA is imported to the Site, it will be from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require chemical testing, unless required by the NYSDEC under the terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete, with no more than 10% by weight passing through a No. 10 sieve. RCA is not acceptable for and will not be used as cover or drainage material or to fill areas beneath the groundwater table. Crushed virgin stone from a permitted mine or quarry may also be imported without chemical testing is sieve analysis shows no more than 10% by weight passing through a No. 10 sieve.

Trucks entering the Site with imported soils will be secured with tight fitting covers.

Non-compliant soils will not be imported to the Site. 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. 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. The contents of this RAWP and NYSDEC approval of this RAWP should not be construed as an approval for this purpose.

Documentation of backfill sources will be provided to NYSDEC for review and approval prior to importing material to the site.

The FER will include the following certification by the RE: "I certify that all import of soils from off-Site, including source evaluation, approval, and sampling, has been performed in a manner that is consistent with the methodology defined in the RAWP".

5.4.10 Stormwater Pollution Prevention

As detailed in Section 4.1.6 and 4.3.2, silt fencing or hay bales will be installed around the perimeter of the remediation area in compliance with a NYSDEC-approved and NYCDEP-approved SWPPP. Best management practices for soil erosion will be selected and implemented, as needed, to minimize erosion and sedimentation off-Site.

5.4.11 Contingency Plan

If USTs or other previously unidentified contaminant sources are found during on-Site remedial excavation or development-related construction, sampling will be performed on product, if encountered, and surrounding subsurface materials (e.g., soil, stone, etc.) in accordance with Section 5.2.1. Chemical analyses associated with the discovery of USTs will be completed in accordance with Section 5.2.1; chemical analysis associated with other unknown environmental conditions will be for full scan parameters (Part 375 VOCs, SVOCs, PCBs, pesticides, herbicides, cyanide, and metals including hexavalent and trivalent chromium) as well as emerging contaminants 1,4-dioxane and PFAs. Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during ground-intrusive work will be promptly communicated by phone to the NYSDEC Project Manager. These findings will also be detailed in the daily reports and the subsequent monthly BCP progress report.

It is anticipated that a Track 1 cleanup will be achieved. SCOs for a Track 1 cleanup are presented in Table 4.

5.4.12 Community Air Monitoring Plan

Community air monitoring will be conducted in compliance with the NYSDOH Generic CAMP outlined below and provided as Attachment E in the CHASP.

The CAMP will include real-time monitoring for VOCs and particulates at the upwind perimeter of the Site and downwind perimeter of each designated work area when ground-intrusive work is in progress. Continuous monitoring will be required for all ground-intrusive work. Ground-intrusive work includes, but is not limited to, soil/fill excavation and handling and utility trenching. Periodic monitoring for VOCs may be required during non-intrusive work such as the collection of soil samples. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location and taking a reading prior to leaving a sample location.

CAMP monitoring of total VOC levels will be conducted using PIDs, and monitoring for particulates will be conducted using particulate sensors equipped with filters that can detect airborne particulates less than 10 microns in diameter (PM10). Monitoring for particulates and odors will be conducted during ground-intrusive work by a field engineer, scientist, or geologist under the supervision of the RE. The work zone is defined as the general area in which machinery is operating in support of remediation. A portable PID will be used to monitor the work zone and for periodic monitoring of total VOC levels during work such as soil sampling. The Site perimeter will be visually monitored for fugitive dust emissions.

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

- If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work 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 will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work will resume provided that the total VOC 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, work will be shut down.

The following actions will be taken based on dust levels measured or visual dust observations:

- 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 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.

Sustained concentrations of VOCs or PM10 will be reported to the NYSDEC and NYSDOH Project Managers and included in the daily report. In addition, a map showing the location of the downwind and upwind CAMP stations will be included in the daily report.

5.4.13 Odor, Dust and Nuisance Control Plan

Dust, odor, and nuisance control will be accomplished by the remediation contractor as described in this section. The FER will include the following certification by the RE: "I certify that ground-intrusive work during remediation and development-related construction was conducted in accordance with dust and odor suppression methodology defined in the RAWP."

5.4.14 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-Site. Specific odor control methods to be used on a routine basis (if needed) will include application of foam suppressants or tarps over the odor or VOC source areas, if encountered. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Volunteers' RE, who is responsible for certifying the FER. Application of odor controls is the responsibility of the Remedial Contractor.

All 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 non-PFAS foams to cover exposed odorous soils or PFAS containing foams that will be remediated immediately after use. 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, (b) use of staff to monitor odors in surrounding neighborhoods.

Although not anticipated, 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.

5.4.15 Dust Control Plan

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

- Dust suppression will be achieved through the use of a dedicated water distribution system or on-Site water truck for road wetting, or an alternate source with suitable supply and pressure for use in dust control.
- Stockpiles shall be maintained in accordance with Section 5.4.2.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-Site roads will be limited in total area to minimize the area required for water spraying.

5.4.16 Other Nuisances

A plan for rodent control will be developed and used by the remediation contractor during Site preparation (including clearing and grubbing) and during remedial work.

A plan for noise control will be developed and used by the remediation contractor during Site preparation and remedial work and will conform, at a minimum, to the NYCDEP noise control standards.

6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

Residual contaminated soil and groundwater will not exist beneath the development footprint after the Track 1 remedy is complete; therefore, ECs and ICs will not be required to protect human health and the environment. If a Track 1 is not achieved, residual contamination will be managed in place through the implementation of institutional controls.

The FER will document the end point sample results on the Site in tabular and map form. This will include presentation of and exceedances of Unrestricted Use SCOs, Protection of Groundwater SCOs, and Restricted Residential RUSCOs.

7.0 INSTITUTIONAL CONTROLS

If a Track 1 Unrestricted Use cleanup cannot be achieved, two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and an SMP requiring compliance with the management of remaining contamination at the Site. These elements are described in this section.

A Site-specific Environmental Easement will be recorded with Kings County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all ICs placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

7.1 Environmental Easement

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination above Unrestricted Use SCOs is left on-Site after the Remedial Action is complete. If the Site will have residual contamination after completion of all Remedial Actions, then an Environmental Easement is required. As part of a Track 2 or split Track 1/2 remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Kings County Clerk. The Environmental Easement will be submitted as part of the FER.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Kings County Clerk or City Register before the Certificate of Completion can be issued by NYSDEC. A series of ICs are required under this remedy to implement and prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted residential, commercial, and industrial use(s) only. These ICs are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. ICs can, generally, be subdivided between controls that support ECs, and those that place general restrictions on Site usage or other requirements. ICs in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

Adherence to these ICs for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section).

The Controlled Property (Site) will also have a series of ICs in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose as approved by NYSDOH and NYSDEC;
- All future activities on the Controlled Property that will disturb residual contaminated material, if present, are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Controlled Property may be used for restricted residential, commercial, or industrial use only, provided the long-term ICs included in the SMP are employed and in compliance with current zoning;

- The Controlled Property may not be used for a higher level of use, such as unrestricted or residential use without an amendment or extinguishment of this Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This statement must be certified by an expert that the NYSDEC finds acceptable.

7.2 Site Management Plan

Site Management is the last phase of remediation. If a Track 1 Unrestricted Use cleanup cannot be achieved, the SMP is submitted as part of the FER but will be written in a manner that allows its use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all ICs; (2) development and implementation of monitoring systems and a Monitoring Plan, if applicable; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual), if applicable; (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation, if applicable.

The SMP will include two plans: (1) an Institutional Control Plan for implementation and management of ICs; and (2) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management, reporting, and IC certification will be scheduled on a certification period basis. The certification period will be annual. The SMP will be based on a calendar year and will be due for submission to NYSDEC by March 1 of the year following the reporting period.

No exclusions for handling of residual contaminated soils, if any is remaining on the Site, will be provided in the SMP. All handling of residual contaminated material, if any, will be subject to provisions contained in the SMP.

8.0 FINAL ENGINEERING REPORT

A FER will be submitted to the NYSDEC following implementation of the remedy defined in this RAWP. The FER will be prepared in conformance with NYSDEC DER-10 and will include the following:

- Documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan
- A comprehensive account of the locations and characteristics of material removed from the Site including the surveyed map(s) of each source, as necessary
- As-built drawings for constructed elements, certifications, manifests, and bills of lading
- A description of the changes to the remedy from the elements provided in the RAWP and associated design documents, if any
- A tabular summary of performance evaluation sampling results and material characterization results and other sampling and chemical analyses performed as part of the remedy
- Written and photographic documentation of remedial work performed under this remedy
- An itemized tabular description of actual costs incurred during implementation of the remedy
- If necessary, a thorough summary of remaining contamination and an explanation for why the material was not removed as part of the remedy. A table and a map that shows remaining contamination in excess of the Unrestricted Use SCOs and Restricted Residential RUSCOs will also be included.

- An accounting of the destination of material removed from the Site, including excavated contaminated soil, fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with the disposal of material must also include records and approvals for receipt of the material.
- An accounting of the origin and chemical quality of each material type imported onto the Site

Before approval of the FER and issuance of a Certificate of Completion, the daily reports and monthly BCP progress reports must be submitted in digital form on electronic media (e.g., PDF).

8.1 Certifications

The following certification will appear in front of the FER Executive Summary. The certification will be signed by the PE, Ronald D. Boyer, who is a NYS-licensed Professional Engineer. The certification will be appropriately signed and stamped. The certification will include the following statements:

I, Ronald D. Boyer, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the 12096 Flatlands Avenue Site.

I certify that the Site description presented in this Final Engineering Report is identical to the Site descriptions presented in the Brownfield Cleanup Agreement for the 12096 Flatlands Avenue Site.

I certify that the Remedial Action Work Plan dated [month day year] and Stipulations [if any] in a letter dated [month day year] and approved by the NYSDEC were implemented and that all requirements in those documents have been substantively complied with.

I certify that the remedial activities were observed by qualified environmental professionals under my supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved.

I certify that the export of contaminated soil, fill, water, or other material from the property was performed in accordance with the Remedial Action Work Plan, and were taken to facilities licensed to accept this material in full compliance with all federal, state, and local laws.

I certify that import of soils from off-Site, including source approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan.

I certify that ground-intrusive work during remediation and development-related construction was conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan.

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

It is a violation of Article 130 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 130, New York State Education Law.

9.0 SCHEDULE

Implementation of this RAWP is anticipated to begin in the first quarter of 2024. Mobilization is expected to take about one to two weeks. Once mobilization is complete, remediation of the Site will commence. The remedy, which will be implemented in accordance with this RAWP, is anticipated to take about 6 months to complete. After completion of the remedy, a FER will be submitted to the NYSDEC for review and approval.

10.0 REFERENCES

1. AKRF, Inc., Fresh Creek Estates, Technical Memorandum to the Draft Environmental Impact Statement (DEIS), dated June 1991.
2. Soil Engineering Services, Inc., Subsurface Investigation and Report, dated March 1994.
3. Soil Mechanics Environmental Services, Phase I Environmental Site Assessment, dated April 2003.
4. Soil Mechanics Environmental Services, Phase I Environmental Site Assessment for Flatlands Ave. & Pennsylvania Ave., dated April 2003.
5. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Phase I Environmental Site Assessment, dated 24 August 2018.

6. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Limited Phase II Environmental Investigation Report, dated 24 April 2018.

7. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Remedial Investigation Work Plan, dated 19 May 2020.

8. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Remedial Investigation Report, dated 14 January 2022.

9. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Draft Supplemental Remedial Investigation Report, dated 7 June 2023.

10. New York State Department of Health, Final Guidance for the Evaluation of Soil Vapor Intrusion in the State of New York, dated October 2006.

11. New York State Department of Environmental Conservation, Division of Environmental Remediation, Draft Brownfield Cleanup Program Guide, dated May 2004.

12. New York State Department of Environmental Conservation, Division of Environmental Remediation, Technical and Administrative Guidance Memorandum No. 4031 Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Waste Sites, dated October 27, 1989.

13. New York State Department of Environmental Conservation, Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated May 3, 2010; effective June 18, 2010.

14. New York State Department of Environmental Conservation, Part 375 of Title 6 of the New York Compilation of Codes, Rules, and Regulations, Effective December 14, 2006.

15. New York State Department of Environmental Conservation Sampling, Analysis, and Assessment of PFAS guidance (April 2023)

16. New York State Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) dated June 1998.

17. New York State Division of Water Technical and Operational Guidance Series (TOGS) 5.1.8 New York State Stormwater Management Design Manual, dated June 2008.

18. United States Environmental Protection Agency, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, "EPA/540/S-95/504, April 1996.

TABLES

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-15	LSB-15	LSB-15	LSB-16	LSB-16	LSB-16	LSB-16	LSB-17	LSB-17	LSB-17	LSB-18	LSB-18	LSB-18	LSB-19	LSB-19
					Sample Name	005_LSB-15A	006_LSB-15B	LSB15A_16.5-18.5	014_LSB-16A	015_DUP-1	016_LSB-16B	LSB16A_19.5-21.5	007_LSB-17A	008_LSB-17B	LSB17A_14-16	011_LSB-18A	012_LSB-18B	LSB18A_16.5-18.5	019_LSB-19A	020_LSB-19B
					Sample Date	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018
					Sample Depth	0-2	12-14	16.5-18.5	0-2	0-2	14-16	19.5-21.5	0-2	10-12	14-16	0-2	12-14	16.5-18.5	0-2	10-12
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds																				
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
1,1,1-Trichloroethane	71-55-6	0.68	0.68	100	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	NA	<0.0031 U	<0.0026 U	<0.0022 U	NA	<0.0025 U	<0.0046 U	NA	<0.0025 U	<0.0032 U	NA	<0.0028 U	<0.0026 U
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
1,1-Dichloroethane	75-34-3	0.27	0.27	26	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
1,1-Dichloroethene	75-35-4	0.33	0.33	100	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
1,1-Dichloropropene	563-58-6	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	mg/kg	NA	NA	<0.0038 U	NA	NA	NA	<0.0019 U	NA	NA	<0.003 U	NA	NA	<0.0029 U	NA	NA
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
1,2,4-Trimethylbenzene	95-63-6	3.6	3.6	52	mg/kg	<0.0024 UJ	<0.003 UJ	<0.0038 U	<0.0031 UJ	<0.0026 UJ	<0.0022 UJ	<0.0019 U	<0.0025 UJ	<0.0046 UJ	<0.003 U	<0.0025 UJ	<0.0032 UJ	<0.0029 U	<0.0028 UJ	<0.0026 UJ
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0057 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0029 U	<0.0025 U	<0.0046 U	<0.0045 U	<0.0025 U	<0.0032 U	<0.0044 U	<0.0028 U	<0.0026 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
1,2-Dichlorobenzene	95-50-1	1.1	1.1	100	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
1,2-Dichloroethane	107-06-2	0.02	0.02	3.1	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
1,2-Dichloropropane	78-87-5	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	8.4	52	mg/kg	<0.0024 UJ	<0.003 UJ	<0.0038 U	<0.0031 UJ	<0.0026 UJ	<0.0022 UJ	<0.0019 U	<0.0025 UJ	<0.0046 UJ	0.00029 J	<0.0025 UJ	<0.0032 UJ	<0.0029 U	<0.0028 UJ	<0.0026 UJ
1,3-Dichlorobenzene	541-73-1	2.4	2.4	49	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
1,3-Dichloropropane	142-28-9	NS	NS	NS	mg/kg	<0.0024 UJ	<0.003 UJ	<0.0038 U	<0.0031 UJ	<0.0026 UJ	<0.0022 UJ	<0.0019 U	<0.0025 UJ	<0.0046 UJ	<0.003 U	<0.0025 UJ	<0.0032 UJ	<0.0029 U	<0.0028 UJ	<0.0026 UJ
1,4-Dichlorobenzene	106-46-7	1.8	1.8	13	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
1,4-Diethyl Benzene	105-05-5	NS	NS	NS	mg/kg	NA	NA	<0.0038 U	NA	NA	NA	<0.0019 U	NA	NA	<0.003 U	NA	NA	<0.0029 U	NA	NA
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	0.1	13	mg/kg	<0.049 UJ	<0.06 UJ	<0.15 U	<0.061 UJ	<0.052 UJ	<0.045 UJ	<0.076 U	<0.051 UJ	<0.093 UJ	<0.12 U	<0.049 UJ	<0.065 UJ	<0.12 U	<0.057 UJ	<0.052 UJ
2,2-Dichloropropane	594-20-7	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
2-Chlorotoluene	95-49-8	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
2-Hexanone (MBK)	591-78-6	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0096 U	<0.0025 U	<0.0046 U	<0.015 U	<0.0025 U	<0.0032 U	<0.014 U	<0.0028 U	<0.0026 U
4-Chlorotoluene	106-43-4	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
4-Ethyltoluene	622-96-8	NS	NS	NS	mg/kg	NA	NA	<0.0038 U	NA	NA	NA	<0.0019 U	NA	NA	<0.003 U	NA	NA	<0.0029 U	NA	NA
Acetone	67-64-1	**0.05**	0.05	100	mg/kg	0.0078 J	0.043 J	**0.27**	0.013 J	<0.0052 UJ	0.033 J	0.023	<0.0051 UJ	**0.08 J**	**0.15**	<0.0049 UJ	0.029 J	0.018	0.011 J	0.04 J
Acrolein	107-02-8	NS	NS	NS	mg/kg	<0.0049 U	<0.006 U	NA	<0.0061 U	<0.0052 U	<0.0045 U	NA	<0.0051 U	<0.0093 U	NA	<0.0049 U	<0.0065 U	NA	<0.0057 U	<0.0052 U
Acrylonitrile	107-13-1	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0077 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0038 U	<0.0025 U	<0.0046 U	<0.006 U	<0.0025 U	<0.0032 U	<0.0058 U	<0.0028 U	<0.0026 U
Benzene	71-43-2	0.06	0.06	4.8	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
Bromobenzene	108-86-1	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
Bromochloromethane	74-97-5	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
Bromodichloromethane	75-27-4	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
Bromoform	75-25-2	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0077 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0038 U	<0.0025 U	<0.0046 U	<0.006 U	<0.0025 U	<0.0032 U	<0.0058 U	<0.0028 U	<0.0026 U
Bromomethane	74-83-9	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
Carbon Disulfide	75-15-0	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.019 U	<0.0031 U	<0.0026 U	<0.0022 U	0.0056 J	<0.0025 U	<0.0046 U	<0.015 U	<0.0025 U	0.0045 J	<0.014 U	<0.0028 U	<0.0026 U
Carbon Tetrachloride	56-23-5	0.76	0.76	2.4	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
Chlorobenzene	108-90-7	1.1	1.1	100	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
Chloroethane	75-00-3	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
Chloroform	67-66-3	0.37	0.37	49	mg/kg	<0.0024 U	<0.003 U	<0.0029 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0014 U	<0.0025 U	<0.0046 U	<0.0022 U	<0.0025 U	<0.0032 U	<0.0022 U	<0.0028 U	<0.0026 U
Chloromethane	74-87-3	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0077 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0038 U	<0.0025 U	<0.0046 U	<0.006 U	<0.0025 U	<0.0032 U	<0.0058 U	<0.0028 U	<0.0026 U
Cis-1,2-Dichloroethene	156-59-2	0.25	0.25	100	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
Cyclohexane	110-82-7	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	NA	<0.0031 U	<0.0026 U	<0.0022 U	NA	<0.0025 U	<0.0046 U	NA	<0.0025 U	<0.0032 U	NA	<0.0028 U	<0.0026 U
Cymene	99-87-6	NS	NS	NS	mg/kg	NA	NA	<0.0019 U	NA	NA	NA	0.00022 J	NA	NA	<0.0015 U	NA	NA	0.00023 J	NA	NA
Dibromochloromethane	124-48-1	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
Dibromomethane	74-95-3	NS	NS	NS	mg/kg	<0.0024 UJ	<0.003 UJ	<0.0038 U	<0.0031 UJ	<0.0026 UJ	<0.0022 UJ	<0.0019 U	<0.0025 UJ	<0.0046 UJ	<0.003 U	<0.0025 UJ	<0.0032 UJ	<0.0029 U	<0.0028 UJ	<0.0026 UJ
Dichlorodifluoromethane	75-71-8	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0096 U	<0.0025 U	<0.0046 U	<0.015 U	<0.0025 U	<0.0032 U	<0.014 U	<0.0028 U	<0.0026 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	NS	mg/kg	NA	NA	<0.0038 U	NA	NA	NA	<0.0019 U	NA	NA	<0.003 U	NA	NA	<0.0029 U	NA	NA
Ethylbenzene	100-41-4	1	1	41	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
Hexachlorobutadiene	87-68-3	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0077 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0038 U	<0.0025 U	<0.0046 U	<0.006 U	<0.0025 U	<0.0032 U	<0.0058 U	<0.0028 U	<0.0026 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
M,P-Xylene	179601-23-1	NS	NS	NS	mg/kg	<0.0049 U	<0.006 U	<0.0038 U	<0.0061 U	<0.0052 U	<0.0045 U	<0.0019 U	<0.0051 U	<0.0093 U	<0.003 U	<0.0049 U	<0.0065 U	<0.0029 U	<0.0057 U	<0.0052 U
Methyl Acetate	79-20-9	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	NA	<0.0031 U	<0.0026 U	<0.0022 U	NA	<0.0025 U	<0.0046 U	NA	<0.0025 U	<0.0032 U	NA	<0.0028 U	<0.0026 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	0.12	100	mg/kg	<0.0024 U	0.0074	0.065	<0.0031 U	<0.0026 U	0.009	<0.0096 U	<0.0025 U	0.013	0.039	<0.0025 U	0.0089	<0.014 U	<0.0028 U	0.008
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0096 U	<0.0025 U	<0.0046 U	<0.015 U	<0.0025 U	<0.0032 U	<0.014 U	<0.0028 U	<0.0026 U
Methylcyclohexane	108-87-2	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	NA	<0.0031 U	<0.0026 U	<0.0022 U	NA	<0.0025 U	<0.0046 U	NA	<0.0025 U	<0.0032 U	NA	<0.0028 U	<0.0026 U
Methylene Chloride	75-09-2	0.05	0.05	100	mg/kg	0.0094 J	<0.006 UJ	<0.0096 U	0.0076 J	<0.0052 UJ	0.005 J	<0.0048 U	<0.0051 UJ	0.013 J	<0.0075 U	<0.0049 UJ	<0.0065 UJ	<0.0073 U	0.0062 J	<0.0052 UJ
Naphthalene	91-20-3	12	12	100	mg/kg	NA	NA	<0.0077 U	NA	NA	NA	<0.0038 U	NA	NA	<0.006 U	NA	NA	0.0013 J	NA	NA
n-Butylbenzene	104-51-8	12	12	100	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
n-Propylbenzene	103-65-1	3.9	3.9	100	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
p-Cymene (p-Isopropyltoluene)	CYMP	NS	NS	NS	mg/kg	<0.0024 UJ	<0.003 UJ	NA	<0.0031 UJ	<0.0026 UJ	<0.0022 UJ	NA	<0.0025 UJ	<0.0046 UJ	NA	<0.0025 UJ	<0.0032 UJ	NA	<0.0028 UJ	<0.0026 UJ
Sec-Butylbenzene	135-98-8	11	11	100	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
Styrene	100-42-5	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
T-Butylbenzene	98-06-6	5.9	5.9	100	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
Tert-Butyl Alcohol	75-65-0	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	NA	<0.0031 U	<0.0026 U	<0.0022 U	NA	<0.0025 U	<0.0046 U	NA	<0.0025 U	<0.0032 U	NA	<0.0028 U	<0.0026 U
Tert-Butyl Methyl Ether	1634-04-4	0.93	0.93	100	mg/kg	<0.0024 U	<0.003 U	<0.0038 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0019 U	<0.0025 U	<0.0046 U	<0.003 U	<0.0025 U	<0.0032 U	<0.0029 U	<0.0028 U	<0.0026 U
Tetrachloroethene (PCE)	127-18-4	1.3	1.3	19	mg/kg	<0.0024 U	<0.003 U	<0.00096 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00048 U	<0.0025 U	<0.0046 U	<0.00075 U	<0.0025 U	<0.0032 U	<0.00073 U	<0.0028 U	<0.0026 U
Toluene	108-88-3	0.7	0.7	100	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	NS	mg/kg	NA	NA	<0.0019 U	NA	NA	NA	<0.00096 U	NA	NA	<0.0015 U	NA	NA	<0.0014 U	NA	NA
Total Xylenes	1330-20-7	0.26	1.6	100	mg/kg	<0.0073 U	<0.0089 U	<0.0019 U	<0.0092 U	<0.0078 U	<0.0067 U	<0.00096 U	<0.0076 U	<0.014 U	<0.0015 U	<0.0074 U	<0.0097 U	<0.0014 U	<0.0085 U	<0.0078 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	NS	mg/kg	NA	NA	<0.00096 U	NA	NA	NA	<0.00048 U	NA	NA	<0.00075 U	NA	NA	<0.00073 U	NA	NA
Trans-1,2-Dichloroethene	156-60-5	0.19	0.19	100	mg/kg	<0.0024 U	<0.003 U	<0.0029 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0014 U	<0.0025 U	<0.0046 U	<0.0022 U	<0.0025 U	<0.0032 U	<0.0022 U	<0.0028 U	<0.0026 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	NS	mg/kg	NA	NA	<0.0096 U	NA	NA	NA	<0.0048 U	NA	NA	<0.0075 U	NA	NA	<0.0073 U	NA	NA
Trichloroethene (TCE)	79-01-6	0.47	0.47	21	mg/kg	<0.0024 UJ	<0.003 UJ	<0.00096 U	<0.0031 UJ	<0.0026 UJ	<0.0022 UJ	<0.00048 U	<0.0025 UJ	<0.0046 UJ	<0.00075 U	<0.0025 UJ	<0.0032 UJ	<0.00073 U	<0.0028 UJ	<0.0026 UJ
Trichlorofluoromethane	75-69-4	NS	NS	NS	mg/kg	<0.0024 U	<0.003 U	<0.0077 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.0038 U	<0.0025 U	<0.0046 U	<0.006 U	<0.0025 U	<0.0032 U	<0.0058 U	<0.0028 U	<0.0026 U
Vinyl Acetate	108-05-4	NS	NS	NS	mg/kg	NA	NA	<0.019 U	NA	NA	NA	<0.0096 U	NA	NA	<0.015 U	NA	NA	<0.014 U	NA	NA
Vinyl Chloride	75-01-4	0.02	0.02	0.9	mg/kg	<0.0024 U	<0.003 U	<0.0019 U	<0.0031 U	<0.0026 U	<0.0022 U	<0.00096 U	<0.0025 U	<0.0046 U	<0.0015 U	<0.0025 U	<0.0032 U	<0.0014 U	<0.0028 U	<0.0026 U

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-15	LSB-15	LSB-15	LSB-16	LSB-16	LSB-16	LSB-16	LSB-17	LSB-17	LSB-17	LSB-18	LSB-18	LSB-18	LSB-19	LSB-19
					Sample Name	005_LSB-15A	006_LSB-15B	LSB15A_16.5-18.5	014_LSB-16A	015_DUP-1	016_LSB-16B	LSB16A_19.5-21.5	007_LSB-17A	008_LSB-17B	LSB17A_14-16	011_LSB-18A	012_LSB-18B	LSB18A_16.5-18.5	019_LSB-19A	020_LSB-19B
					Sample Date	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018
					Sample Depth	0-2	12-14	16.5-18.5	0-2	0-2	14-16	19.5-21.5	0-2	10-12	14-16	0-2	12-14	16.5-18.5	0-2	10-12
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds																				
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	mg/kg	<0.0882 U	<0.107 U	<0.22 U	<0.0923 U	<0.0917 U	<0.0916 U	<0.2 U	<0.0891 U	<0.103 U	<0.22 U	<0.0888 U	<0.0953 U	<0.22 U	<0.0884 U	<0.0933 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
1,2-Dichlorobenzene	95-50-1	1.1	1.1	100	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
1,2-Diphenylhydrazine	122-66-7	NS	NS	NS	mg/kg	<0.0442 UJ	<0.0538 UJ	NA	<0.0463 UJ	<0.0459 UJ	<0.0459 UJ	NA	<0.0447 UJ	<0.0517 UJ	NA	<0.0445 UJ	<0.0478 UJ	NA	<0.0443 UJ	<0.0468 UJ
1,3-Dichlorobenzene	541-73-1	2.4	2.4	49	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
1,4-Dichlorobenzene	106-46-7	1.8	1.8	13	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	0.1	13	mg/kg	NA	NA	<0.033 U	NA	NA	NA	<0.029 U	NA	NA	<0.032 U	NA	NA	<0.034 U	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	NS	NS	NS	mg/kg	<0.0882 U	<0.107 U	NA	<0.0923 U	<0.0917 U	<0.0916 U	NA	<0.0891 U	<0.103 U	NA	<0.0888 U	<0.0953 U	NA	<0.0884 U	<0.0933 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.13 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.12 U	<0.0447 U	<0.0517 U	<0.13 U	<0.0445 U	<0.0478 U	<0.13 U	<0.0443 U	<0.0468 U
2,4-Dichlorophenol	120-83-2	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.2 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.18 U	<0.0447 U	<0.0517 U	<0.19 U	<0.0445 U	<0.0478 U	<0.2 U	<0.0443 U	<0.0468 U
2,4-Dimethylphenol	105-67-9	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
2,4-Dinitrophenol	51-28-5	NS	NS	NS	mg/kg	<0.0882 UJ	<0.107 UJ	<1 U	<0.0923 UJ	<0.0917 UJ	<0.0916 UJ	<0.94 U	<0.0891 UJ	<0.103 UJ	<1 U	<0.0888 UJ	<0.0953 UJ	<1.1 U	<0.0884 UJ	<0.0933 UJ
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	mg/kg	<0.0442 UJ	<0.0538 UJ	<0.22 U	<0.0463 UJ	<0.0459 UJ	<0.0459 UJ	<0.2 U	<0.0447 UJ	<0.0517 UJ	<0.22 U	<0.0445 UJ	<0.0478 UJ	<0.22 U	<0.0443 UJ	<0.0468 UJ
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	mg/kg	<0.0442 UJ	<0.0538 UJ	<0.22 U	<0.0463 UJ	<0.0459 UJ	<0.0459 UJ	<0.2 U	<0.0447 UJ	<0.0517 UJ	<0.22 U	<0.0445 UJ	<0.0478 UJ	<0.22 U	<0.0443 UJ	<0.0468 UJ
2-Chloronaphthalene	91-58-7	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
2-Chlorophenol	95-57-8	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
2-Methylnaphthalene	91-57-6	NS	NS	NS	mg/kg	0.213 DE	0.423 DE	<0.26 U	<0.0463 U	<0.0459 U	<0.0459 U	0.14 J	0.784 DE	<0.0517 U	<0.26 U	<0.0445 U	<0.0478 U	<0.27 U	0.0608 JDE	<0.0468 U
2-Methylphenol (o-Cresol)	95-48-7	0.33	0.33	100	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
2-Nitroaniline	88-74-4	NS	NS	NS	mg/kg	<0.0882 UJ	<0.107 UJ	<0.22 U	<0.0923 UJ	<0.0917 UJ	<0.0916 UJ	<0.2 U	<0.0891 UJ	<0.103 UJ	<0.22 U	<0.0888 UJ	<0.0953 UJ	<0.22 U	<0.0884 UJ	<0.0933 UJ
2-Nitrophenol	88-75-5	NS	NS	NS	mg/kg	<0.0442 UJ	<0.0538 UJ	<0.47 U	<0.0463 UJ	<0.0459 UJ	<0.0459 UJ	<0.42 U	<0.0447 UJ	<0.0517 UJ	<0.47 U	<0.0445 UJ	<0.0478 UJ	<0.48 U	<0.0443 UJ	<0.0468 UJ
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	0.33	0.33	100	mg/kg	<0.0442 U	<0.0538 U	<0.32 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.28 U	<0.0447 U	<0.0517 U	<0.31 U	<0.0445 U	<0.0478 U	<0.32 U	<0.0443 U	<0.0468 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
3-Nitroaniline	99-09-2	NS	NS	NS	mg/kg	<0.0882 UJ	<0.107 UJ	<0.22 U	<0.0923 UJ	<0.0917 UJ	<0.0916 UJ	<0.2 U	<0.0891 UJ	<0.103 UJ	<0.22 U	<0.0888 UJ	<0.0953 UJ	<0.22 U	<0.0884 UJ	<0.0933 UJ
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	NS	mg/kg	<0.0882 UJ	<0.107 UJ	<0.57 U	<0.0923 UJ	<0.0917 UJ	<0.0916 UJ	<0.51 U	<0.0891 UJ	<0.103 UJ	<0.56 U	<0.0888 UJ	<0.0953 UJ	<0.58 U	<0.0884 UJ	<0.0933 UJ
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
4-Chloroaniline	106-47-8	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 UJ	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 UJ	<0.0447 U	<0.0517 U	<0.22 UJ	<0.0445 U	<0.0478 U	<0.22 UJ	<0.0443 U	<0.0468 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
4-Nitroaniline	100-01-6	NS	NS	NS	mg/kg	<0.0882 UJ	<0.107 UJ	<0.22 U	<0.0923 UJ	<0.0917 UJ	<0.0916 UJ	<0.2 U	<0.0891 UJ	<0.103 UJ	<0.22 U	<0.0888 UJ	<0.0953 UJ	<0.22 U	<0.0884 UJ	<0.0933 UJ
4-Nitrophenol	100-02-7	NS	NS	NS	mg/kg	<0.0882 U	<0.107 U	<0.31 U	<0.0923 U	<0.0917 U	<0.0916 U	<0.27 U	<0.0891 U	<0.103 U	<0.3 U	<0.0888 U	<0.0953 U	<0.31 U	<0.0884 U	<0.0933 U
Acenaphthene	83-32-9	20	98	100	mg/kg	1.05 DE	0.697 DE	<0.18 U	<0.0463 U	<0.0459 U	<0.0459 U	0.31	0.779 DE	<0.0517 U	<0.17 U	<0.0445 U	<0.0478 U	<0.18 U	0.0473 JDE	<0.0468 U
Acenaphthylene	208-96-8	100	107	100	mg/kg	0.0909 DE	0.0652 JDE	<0.18 U	0.0959 DE	0.0894 JDE	0.0703 JDE	0.058 J	0.39 DE	0.061 JDE	<0.17 U	0.0696 JDE	<0.0478 U	<0.18 U	0.194 DE	0.0977 DE
Acetophenone	98-86-2	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Aniline (Phenylamine, Aminobenzene)	62-53-3	NS	NS	NS	mg/kg	<0.177 U	<0.215 U	NA	<0.185 U	<0.184 U	<0.183 U	NA	<0.178 U	<0.206 U	NA	<0.178 U	<0.191 U	NA	<0.177 U	<0.187 U
Anthracene	120-12-7	100	1000	100	mg/kg	2.55 DE	0.957 DE	<0.13 U	0.159 DE	0.147 DE	<0.0459 U	0.39	1.64 DE	<0.0517 U	<0.13 U	0.13 DE	<0.0478 U	<0.13 U	0.225 DE	0.2 DE
Atrazine	1912-24-9	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	NA	<0.0463 U	<0.0459 U	<0.0459 U	NA	<0.0447 U	<0.0517 U	NA	<0.0445 U	<0.0478 U	NA	<0.0443 U	<0.0468 U
Benzaldehyde	100-52-7	NS	NS	NS	mg/kg	<0.0442 UJ	<0.0538 UJ	NA	<0.0463 UJ	<0.0459 UJ	<0.0459 UJ	NA	<0.0447 UJ	<0.0517 UJ	NA	<0.0445 U	<0.0478 UJ	NA	<0.0443 UJ	<0.0468 UJ
Benzidine	92-87-5	NS	NS	NS	mg/kg	<0.177 U	<0.215 U	NA	<0.185 U	<0.184 U	<0.183 U	NA	<0.178 U	<0.206 U	NA	<0.178 U	<0.191 U	NA	<0.177 U	<0.187 U
Benzo(a)anthracene	56-55-3	**1**	1	1	mg/kg	**4.12 DE**	**1.29 DE**	<0.13 U	0.522 DE	0.403 DE	0.19 DE	0.58	**2.96 DE**	<0.0517 U	<0.13 U	0.555 DE	0.099 DE	0.087 J	0.787 DE	0.699 DE
Benzo(a)pyrene	50-32-8	**1**	22	1	mg/kg	**3.63 DE**	**1.32 DE**	<0.18 U	0.55 DE	0.438 DE	0.247 DE	0.51	**2.81 DE**	<0.0517 U	<0.17 U	0.541 DE	0.0952 JDE	0.084 J	0.928 DE	0.781 DE
Benzo(b)fluoranthene	205-99-2	**1**	1.7	1	mg/kg	**2.85 DE**	0.719 DE	<0.13 U	0.434 DE	0.366 DE	0.17 DE	0.52	**1.57 DE**	<0.0517 U	<0.13 U	0.435 DE	0.08 JDE	0.13	0.7 DE	0.536 DE
Benzo(g,h,i)Perylene	191-24-2	100	1000	100	mg/kg	2.3 DE	0.742 DE	<0.18 U	0.452 DE	0.335 DE	0.176 DE	0.28	1.72 DE	<0.0517 U	<0.17 U	0.405 DE	0.0685 JDE	0.058 J	0.56 DE	0.376 DE
Benzo(k)fluoranthene	207-08-9	**0.8**	1.7	3.9	mg/kg	**2.73 DE**	**0.818 DE**	<0.13 U	0.393 DE	0.342 DE	0.178 DE	0.14	**1.86 DE**	<0.0517 U	<0.13 U	0.445 DE	0.0754 JDE	0.046 J	0.683 DE	0.563 DE
Benzoic Acid	65-85-0	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.71 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.63 U	<0.0447 UJ	<0.0517 U	<0.7 U	<0.0445 U	<0.0478 U	<0.73 U	<0.0443 U	<0.0468 U
Benzyl Alcohol	100-51-6	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	0.0456 JDE	<0.0517 U	<0.22 U	0.0469 JDE	<0.0478 U	<0.22 U	0.0813 JDE	0.396 DE
Biphenyl (Diphenyl)	92-52-4	NS	NS	NS	mg/kg	0.0691 JDE	<0.0538 U	<0.5 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.44 U	0.113 DE	<0.0517 U	<0.49 U	<0.0445 U	<0.0478 U	<0.51 U	<0.0443 U	<0.0468 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.24 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.21 U	<0.0447 U	<0.0517 U	<0.23 U	<0.0445 U	<0.0478 U	<0.24 U	<0.0443 U	<0.0468 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.2 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.18 U	<0.0447 U	<0.0517 U	<0.19 U	<0.0445 U	<0.0478 U	<0.2 U	<0.0443 U	<0.0468 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	NS	mg/kg	<0.0442 UJ	<0.0538 UJ	<0.26 U	<0.0463 UJ	<0.0459 UJ	<0.0459 UJ	<0.23 U	<0.0447 UJ	<0.0517 UJ	<0.26 U	<0.0445 UJ	<0.0478 UJ	<0.27 U	<0.0443 UJ	<0.0468 UJ
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	NS	mg/kg	0.111 DE	0.238 DE	<0.22 U	0.128 DE	11.8 DE	0.116 DE	<0.2 U	0.244 DE	1.09 DE	<0.22 U	0.0959 DE	0.167 DE	<0.22 U	0.3 DE	0.177 DE
Caprolactam	105-60-2	NS	NS	NS	mg/kg	<0.0882 U	<0.107 U	NA	<0.0923 U	<0.0917 U	<0.0916 U	NA	<0.0891 U	<0.103 U	NA	<0.0888 U	<0.0953 U	NA	<0.0884 U	<0.0933 U
Carbazole	86-74-8	NS	NS	NS	mg/kg	0.578 DE	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	0.032 J	0.0627 JDE	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	0.0488 JDE	0.0529 JDE
Chrysene	218-01-9	**1**	1	3.9	mg/kg	**3.59 DE**	**1.51 DE**	<0.13 U	0.553 DE	0.43 DE	0.173 DE	0.6	**3.23 DE**	0.0519 JDE	<0.13 U	0.557 DE	0.099 DE	0.12 J	0.773 DE	0.674 DE
Dibenz(a,h)anthracene	53-70-3	**0.33**	1000	0.33	mg/kg	**0.729 J**	0.234 J	<0.13 U	0.12 J	0.106 J	<0.0459 UJ	0.047 J	**0.519 J**	<0.0517 UJ	<0.13 U	0.126 DE	<0.0478 UJ	<0.13 U	0.194 J	0.142 J
Dibenzofuran	132-64-9	7	210	59	mg/kg	0.607 DE	0.0635 JDE	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	0.063 J	0.0976 DE	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Dibutyl phthalate	84-74-2	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Diethyl phthalate	84-66-2	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Dimethyl phthalate	131-11-3	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Dioctyl phthalate	117-84-0	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	2.2 DE	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Fluoranthene	206-44-0	100	1000	100	mg/kg	8.52 DE	2.59 DE	<0.13 U	0.728 DE	0.576 DE	0.202 DE	1.2	5.28 DE	0.0742 JDE	0.026 J	0.925 DE	0.154 DE	0.2	1.14 DE	0.859 DE
Fluorene	86-73-7	30	386	100	mg/kg	1.06 DE	0.739 DE	<0.22 U	0.0465 JDE	0.0498 JDE	<0.0459 U	0.33	1.25 DE	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	0.122 DE	0.0843 JDE
Hexachlorobenzene	118-74-1	0.33	3.2	1.2	mg/kg	<0.0442 U	<0.0538 U	<0.13 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.12 U	<0.0447 U	<0.0517 U	<0.13 U	<0.0445 U	<0.0478 U	<0.13 U	<0.0443 U	<0.0468 U
Hexachlorobutadiene	87-68-3	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.63 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.56 U	<0.0447 U	<0.0517 U	<0.62 U	<0.0445 U	<0.0478 U	<0.64 U	<0.0443 U	<0.0468 U
Hexachloroethane	67-72-1	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.18 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.16 U	<0.0447 U	<0.0517 U	<0.17 U	<0.0445 U	<0.0478 U	<0.18 U	<0.0443 U	<0.0468 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	8.2	0.5	mg/kg	**1.99 J**	**0.58 J**	<0.18 U	0.304 J	0.262 J	0.127 J	0.27	**1.39 J**	<0.0517 UJ	<0.17 U	0.334 DE	0.0525 J	0.065 J	0.452 J	0.304 J
Isophorone	78-59-1	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.2 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.18 U	<0.0447 U	<0.0517 U	<0.19 U	<0.0445 U	<0.0478 U	<0.2 U	<0.0443 U	<0.0468 U
Naphthalene	91-20-3	12	12	100	mg/kg	0.211 DE	0.12 DE	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	0.1 J	0.234 DE	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	0.22	<0.0443 U	<0.0468 U
Nitrobenzene	98-95-3	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.2 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.18 U	<0.0447 U	<0.0517 U	<0.19 U	<0.0445 U	<0.0478 U	<0.2 U	<0.0443 U	<0.0468 U
n-Nitrosodimethylamine	62-75-9	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	NA	<0.0463 U	<0.0459 U	<0.0459 U	NA	<0.0447 U	<0.0517 U	NA	<0.0445 U	<0.0478 U	NA	<0.0443 U	<0.0468 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	NS	mg/kg	<0.0442 U	<0.0538 U	<0.18 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.16 U	<0.0447 U	<0.0517 U	<0.17 U	<0.0445 U	<0.0478 U	<0.18 U	<0.0443 U	<0.0468 U
Pentachlorophenol	87-86-5	0.8	0.8	6.7	mg/kg	<0.0442 U	<0.0538 U	<0.18 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.16 U	<0.0447 U	<0.0517 U	<0.17 U	<0.0445 U	<0.0478 U	<0.18 U	<0.0443 U	<0.0468 U
Phenanthrene	85-01-8	100	1000	100	mg/kg	9.51 DE	3.96 DE	<0.13 U	0.537 DE	0.41 DE	0.0629 JDE	1.4	8.6 DE	0.061 JDE	<0.13 U	0.486 DE	0.0998 DE	0.093 J	0.749 DE	0.555 DE
Phenol	108-95-2	0.33	0.33	100	mg/kg	<0.0442 U	<0.0538 U	<0.22 U	<0.0463 U	<0.0459 U	<0.0459 U	<0.2 U	<0.0447 U	<0.0517 U	<0.22 U	<0.0445 U	<0.0478 U	<0.22 U	<0.0443 U	<0.0468 U
Pyrene	129-00-0	100	1000	100	mg/kg	10.9 J	4.58 J	<0.13 U	1.03 DE	0.706 DE	0.287 DE	1.4	8.38 J	0.0948 JDE	0.023 J	1.14 DE	0.19 DE	0.16	1.41 DE	1.13 DE
Pyridine	110-86-1	NS	NS	NS	mg/kg	<0.177 U	<0.215 U	NA	<0.185 U	<0.184 U	<0.183 U	NA	<0.178 U	<0.206 U	NA	<0.178 U	<0.191 U	NA	<0.177 U	<0.187 U

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-15	LSB-15	LSB-15	LSB-16	LSB-16	LSB-16	LSB-16	LSB-17	LSB-17	LSB-17	LSB-18	LSB-18	LSB-18	LSB-19	LSB-19
					Sample Name	005_LSB-15A	006_LSB-15B	LSB15A_16.5-18.5	014_LSB-16A	015_DUP-1	016_LSB-16B	LSB16A_19.5-21.5	007_LSB-17A	008_LSB-17B	LSB17A_14-16	011_LSB-18A	012_LSB-18B	LSB18A_16.5-18.5	019_LSB-19A	020_LSB-19B
					Sample Date	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018
					Sample Depth	0-2	12-14	16.5-18.5	0-2	0-2	14-16	19.5-21.5	0-2	10-12	14-16	0-2	12-14	16.5-18.5	0-2	10-12
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Pesticides																				
4,4'-DDD	72-54-8	**0.0033**	14	13	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	**0.00604 J**	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	<0.00188 UJ	<0.00206 U	<0.00174 UJ	<0.00185 UJ
4,4'-DDE	72-55-9	**0.0033**	17	8.9	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	**0.0134 J**	<0.00206 U	<0.00174 UJ	<0.00185 UJ
4,4'-DDT	50-29-3	**0.0033**	136	7.9	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	**0.0141 J**	**0.00867 J**	**0.0127 J**	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	**0.013 J**	**0.0084 J**	<0.00206 U	**0.0117 J**	**0.00444 J**
Aldrin	309-00-2	0.005	0.19	0.097	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	<0.00188 UJ	<0.00206 U	<0.00174 UJ	<0.00185 UJ
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.02	0.48	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.000832 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.000776 U	<0.00176 UJ	<0.00205 U	<0.000876 U	<0.00177 UJ	<0.00188 UJ	<0.000859 U	<0.00174 UJ	<0.00185 UJ
Alpha Chlordane	5103-71-9	0.094	2.9	4.2	mg/kg	0.00576 J	<0.00212 UJ	<0.0025 U	0.00771 J	0.00438 J	<0.0018 UJ	<0.00233 U	0.0149 J	<0.00205 U	<0.00263 U	0.0739 J	<0.00188 UJ	<0.00258 U	0.0121 J	<0.00185 UJ
Alpha Endosulfan	959-98-8	2.4	102	24	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	<0.00188 UJ	<0.00206 U	<0.00174 UJ	<0.00185 UJ
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.09	0.36	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	<0.00188 UJ	<0.00206 U	<0.00174 UJ	<0.00185 UJ
Beta Endosulfan	33213-65-9	2.4	102	24	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	<0.00188 UJ	<0.00206 U	<0.00174 UJ	<0.00185 UJ
Chlordane (alpha and gamma)	57-74-9	NS	NS	NS	mg/kg	<0.0348 UJ	<0.0425 UJ	<0.0166 U	<0.0364 UJ	<0.0363 UJ	<0.036 UJ	<0.0155 U	<0.0352 UJ	<0.0409 U	<0.0175 U	0.113 J	<0.0377 UJ	<0.0172 U	<0.0349 UJ	<0.037 UJ
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	0.25	100	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	<0.00188 UJ	<0.00206 U	<0.00174 UJ	<0.00185 UJ
Dieldrin	60-57-1	**0.005**	0.1	0.2	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.00125 U	<0.00182 UJ	0.00454 J	<0.0018 UJ	<0.00116 U	<0.00176 UJ	<0.00205 U	<0.00131 U	**0.00695 J**	<0.00188 UJ	<0.00129 U	**0.00559 J**	<0.00185 UJ
Endosulfan Sulfate	1031-07-8	2.4	1000	24	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.000832 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.000776 U	<0.00176 UJ	<0.00205 U	<0.000876 U	<0.00177 UJ	<0.00188 UJ	<0.000859 U	<0.00174 UJ	<0.00185 UJ
Endrin	72-20-8	0.014	0.06	11	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.000832 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.000776 U	<0.00176 UJ	<0.00205 U	<0.000876 U	<0.00177 UJ	<0.00188 UJ	<0.000859 U	<0.00174 UJ	<0.00185 UJ
Endrin Aldehyde	7421-93-4	NS	NS	NS	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.0025 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00233 U	<0.00176 UJ	<0.00205 U	<0.00263 U	<0.00177 UJ	<0.00188 UJ	<0.00258 U	<0.00174 UJ	<0.00185 UJ
Endrin Ketone	53494-70-5	NS	NS	NS	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.002 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00186 U	<0.00176 UJ	<0.00205 U	<0.0021 U	<0.00177 UJ	<0.00188 UJ	<0.00206 U	<0.00174 UJ	<0.00185 UJ
Gamma Bhc (Lindane)	58-89-9	0.1	0.1	1.3	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.000832 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.000776 U	<0.00176 UJ	<0.00205 U	<0.000876 U	<0.00177 UJ	<0.00188 UJ	<0.000859 U	<0.00174 UJ	<0.00185 UJ
Gamma Chlordane (Trans)	5103-74-2	NS	NS	NS	mg/kg	NA	NA	<0.0025 U	NA	NA	NA	<0.00233 U	NA	NA	<0.00263 U	NA	NA	<0.00258 U	NA	NA
Gamma-Chlordane	5566-34-7	NS	NS	NS	mg/kg	0.00453 J	<0.00212 UJ	NA	0.0076 J	0.00449 J	<0.0018 UJ	NA	0.0101 J	<0.00205 U	NA	0.0394 J	<0.00188 UJ	NA	0.00938 J	<0.00185 UJ
Heptachlor	76-44-8	0.042	0.38	2.1	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.000998 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.000931 U	<0.00176 UJ	<0.00205 U	<0.00105 U	0.0105 J	<0.00188 UJ	<0.00103 U	<0.00174 UJ	<0.00185 UJ
Heptachlor Epoxide	1024-57-3	NS	NS	NS	mg/kg	<0.00174 UJ	<0.00212 UJ	<0.00374 U	<0.00182 UJ	<0.00182 UJ	<0.0018 UJ	<0.00349 U	<0.00176 UJ	<0.00205 U	<0.00394 U	<0.00177 UJ	<0.00188 UJ	<0.00386 U	<0.00174 UJ	<0.00185 UJ
Methoxychlor	72-43-5	NS	NS	NS	mg/kg	<0.0087 UJ	<0.0106 UJ	<0.00374 U	<0.00911 UJ	<0.00908 UJ	<0.00901 UJ	<0.00349 U	<0.00881 UJ	<0.0102 U	<0.00394 U	<0.00883 UJ	<0.00942 UJ	<0.00386 U	<0.00871 UJ	<0.00925 UJ
Toxaphene	8001-35-2	NS	NS	NS	mg/kg	<0.0881 UJ	<0.107 UJ	<0.0374 U	<0.0922 UJ	<0.0919 UJ	<0.0912 UJ	<0.0349 U	<0.0891 UJ	<0.104 U	<0.0394 U	<0.0894 UJ	<0.0953 UJ	<0.0386 U	<0.0882 UJ	<0.0936 UJ
Herbicides																				
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	NS	mg/kg	NA	NA	<0.219 U	NA	NA	NA	<0.198 U	NA	NA	<0.216 U	NA	NA	<0.221 U	NA	NA
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	NS	mg/kg	NA	NA	<0.219 U	NA	NA	NA	<0.198 U	NA	NA	<0.216 U	NA	NA	<0.221 U	NA	NA
Silvex (2,4,5-Tp)	93-72-1	3.8	3.8	100	mg/kg	NA	NA	<0.219 U	NA	NA	NA	<0.198 U	NA	NA	<0.216 U	NA	NA	<0.221 U	NA	NA
Polychlorinated Biphenyl																				
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	NS	mg/kg	<0.0176 U	<0.0214 U	<0.0651 U	<0.0184 U	<0.0183 U	<0.0182 U	<0.0585 U	<0.0178 U	<0.0207 U	<0.0646 U	<0.0178 U	<0.019 U	<0.0644 U	<0.0176 U	<0.0187 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	NS	mg/kg	<0.0176 U	<0.0214 U	<0.0651 U	<0.0184 U	<0.0183 U	<0.0182 U	<0.0585 U	<0.0178 U	<0.0207 U	<0.0646 U	<0.0178 U	<0.019 U	<0.0644 U	<0.0176 U	<0.0187 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	NS	mg/kg	<0.0176 U	<0.0214 U	<0.0651 U	<0.0184 U	<0.0183 U	<0.0182 U	<0.0585 U	<0.0178 U	<0.0207 U	<0.0646 U	<0.0178 U	<0.019 U	<0.0644 U	<0.0176 U	<0.0187 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	NS	mg/kg	<0.0176 U	<0.0214 U	<0.0651 U	<0.0184 U	<0.0183 U	<0.0182 U	<0.0585 U	<0.0178 U	<0.0207 U	<0.0646 U	<0.0178 U	<0.019 U	<0.0644 U	<0.0176 U	<0.0187 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	NS	mg/kg	<0.0176 U	<0.0214 U	<0.0651 U	<0.0184 U	<0.0183 U	<0.0182 U	0.11	<0.0178 U	<0.0207 U	<0.0646 U	<0.0178 U	<0.019 U	<0.0644 U	<0.0176 U	<0.0187 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	NS	mg/kg	<0.0176 U	<0.0214 U	<0.0651 U	<0.0184 U	<0.0183 U	0.151 P	0.0539 J	<0.0178 U	<0.0207 U	<0.0646 U	<0.0178 U	<0.019 U	<0.0644 U	<0.0176 U	<0.0187 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	NS	mg/kg	0.208	<0.0214 U	<0.0651 U	0.0969	0.069	0.0635	0.0306 J	0.097	0.0342	<0.0646 U	0.0482	0.0363	<0.0644 U	0.0353	<0.0187 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	NS	mg/kg	NA	NA	<0.0651 U	NA	NA	NA	<0.0585 U	NA	NA	<0.0646 U	NA	NA	<0.0644 U	NA	NA
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	NS	mg/kg	NA	NA	<0.0651 U	NA	NA	NA	0.0165 J	NA	NA	<0.0646 U	NA	NA	0.00928 J	NA	NA
Total PCBs	1336-36-3	**0.1**	3.2	1	mg/kg	**0.208**	<0.0214 U	<0.0651 U	0.0969	0.069	**0.215**	**0.211 J**	0.097	0.0342	<0.0646 U	0.0482	0.0363	0.00928 J	0.0353	<0.0187 U
Metals																				
Aluminum	7429-90-5	NS	NS	NS	mg/kg	5,250	5,630	8,210	6,670	4,920	6,760	4,040	6,120	3,600	5,390	7,030	7,310	2,700	6,350	5,750
Antimony	7440-36-0	NS	NS	NS	mg/kg	<0.53 U	0.713	0.635 J	1.45	1.23	<0.549 U	0.815 J	1.14	0.651	0.486 J	<0.536 U	<0.572 U	1.69 J	<0.531 U	0.587
Arsenic	7440-38-2	**13**	16	16	mg/kg	1.46	3.54	3.3	7.71	5.08	<1.1 U	3.17	<1.07 U	5.94	2	5.1	<1.14 U	6.61	3.73	2.62
Barium	7440-39-3	**350**	820	400	mg/kg	113	168	16.9	**697**	346	63.7	77.2	269	**10,400**	16.1	104	93.2	**429**	305	**481**
Beryllium	7440-41-7	7.2	47	72	mg/kg	0.244	0.308	0.515	0.447	0.41	0.294	0.409 J	0.318	0.389	0.326 J	0.261	0.285	0.456 J	0.321	0.298
Cadmium	7440-43-9	**2.5**	7.5	4.3	mg/kg	0.617	**10.7**	<0.997 U	1.14	1.16	<0.33 U	0.28 J	2.08	**4.68**	<1.02 U	0.426	<0.343 U	1.82	1.17	0.72
Calcium	7440-70-2	NS	NS	NS	mg/kg	8,380	6,550	1,460	11,700	10,200	6,060	10,900	11,200	4,960	925	32,900	10,000	15,000	19,300	18,600
Chromium, Hexavalent	18540-29-9	1	19	110	mg/kg	<0.53 U	<0.644 U	<1.06 U	<0.554 U	<0.552 U	<0.549 U	<0.951 UJ	0.855	<0.622 U	<1.06 U	<0.536 U	<0.572 U	<1.09 U	<0.531 U	<0.561 UJ
Chromium, Total	7440-47-3	NS	NS	NS	mg/kg	17.9	21.9	16.4	29.4	19	14.3	22.4 J	25.2	13.2	9.8	18.4	26.9	15	20.9	23.9
Chromium, Trivalent	16065-83-1	**30**	NS	180	mg/kg	17.9	21.9	16.4	29.4	19	14.3	22.4	24.3	13.2	9.8	18.4	26.9	15	20.9	23.9
Cobalt	7440-48-4	NS	NS	NS	mg/kg	5.09	5.79	2.38	7.77	5.62	5.57	4.54	7.35	14.8	1.72 J	6.33	5.91	3.29	6.74	5.54
Copper	7440-50-8	**50**	1720	270	mg/kg	**70.7**	**63.9**	10.9	**155**	**152**	22	32.8	**127**	40.8	5.35	35.3	35.4	**76.3**	**104**	**120**
Cyanide	57-12-5	27	40	27	mg/kg	NA	NA	<1.3 U	NA	NA	NA	<1.2 U	NA	NA	<1.3 U	NA	NA	<1.3 U	NA	NA
Iron	7439-89-6	NS	NS	NS	mg/kg	13,900	21,900	9,820	20,200	15,600	15,800	13,400	42,600	5,830	8,260	12,600	22,100	19,300	19,100	17,400
Lead	7439-92-1	**63**	450	400	mg/kg	**166**	**309**	63	**490**	**446**	**98.6**	**79.1**	**431**	**566**	15.6	**111**	**139**	**4,400**	**426**	**288**
Magnesium	7439-95-4	NS	NS	NS	mg/kg	4,220	1,560	1,350	3,420	3,190	2,750	6,460	3,240	489	996	8,320	2,290	554	7,500	4,150
Manganese	7439-96-5	1600	2000	2000	mg/kg	215	192	114	205	196	226	125 J	322	75.2	56.9	263	290	169	246	221
Mercury	7439-97-6	**0.18**	0.73	0.81	mg/kg	**0.241**	**0.213**	<0.088 U	**0.465**	**0.35**	0.084	0.089	**0.432**	0.0951	0.101	**0.211**	0.103	0.14	**0.505**	**0.256**
Nickel	7440-02-0	**30**	130	310	mg/kg	17	15	7.71	27.6	20.6	20.6	26.6 J	**66.4**	9.49	5.3	**31**	18.9	7.05	24.6	21
Potassium	7440-09-7	NS	NS	NS	mg/kg	504	431	457	537	466	748	406	541	511	272	1,470	702	<260 U	639	654
Selenium	7782-49-2	**3.9**	4	180	mg/kg	<1.06 U	<1.29 U	0.565 J	<1.11 U	<1.1 U	<1.1 U	0.259 J	<1.07 U	<1.24 U	0.274 J	<1.07 U	<1.14 U	1.89 J	<1.06 U	<1.12 U
Silver	7440-22-4	**2**	8.3	180	mg/kg	<0.53 U	<0.644 U	<0.498 U	<0.554 U	<0.552 U	<0.549 U	<0.449 U	<0.534 U	<0.622 U	<0.508 U	<0.536 U	<0.572 U	0.594	<0.531 U	<0.561 U
Sodium	7440-23-5	NS	NS	NS	mg/kg	107	130	<199 U	182	164	143	<180 U	132	166	<203 U	139	152	<208 U	170	272
Thallium	7440-28-0	NS	NS	NS	mg/kg	<1.06 U	<1.29 U	<1.99 U	<1.11 U	<1.1 U	<1.1 U	<1.8 U	<1.07 U	<1.24 U	<2.03 U	<1.07 U	<1.14 U	<2.08 U	<1.06 U	<1.12 U
Vanadium	7440-62-2	NS	NS	NS	mg/kg	20.5	15.7	22.5	26.6	22.7	19.7	19.8	23.9	19.3	13.6	22	22.8	15.9	22.9	17.8
Zinc	7440-66-6	**109**	2480	10000	mg/kg	**203**	**3,540**	18.5	**431**	**384**	88.1	94.2 J	**635**	**9,280 D**	30.4	**115**	95.2	**2,030**	**414**	**235**
General Chemistry																				
Total Solids	TSOLID	NS	NS	NS	Percent	94.4	77.7	75.4	90.3	90.6	91	84.1	93.6	80.4	75.3	93.4	87.4	73.4	94.1	89.1

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-15	LSB-15	LSB-15	LSB-16	LSB-16	LSB-16	LSB-16	LSB-17	LSB-17	LSB-17	LSB-18	LSB-18	LSB-18	LSB-19	LSB-19
					Sample Name	005_LSB-15A	006_LSB-15B	LSB15A_16.5-18.5	014_LSB-16A	015_DUP-1	016_LSB-16B	LSB16A_19.5-21.5	007_LSB-17A	008_LSB-17B	LSB17A_14-16	011_LSB-18A	012_LSB-18B	LSB18A_16.5-18.5	019_LSB-19A	020_LSB-19B
					Sample Date	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018	04/19/2023	05/08/2018	05/08/2018
					Sample Depth	0-2	12-14	16.5-18.5	0-2	0-2	14-16	19.5-21.5	0-2	10-12	14-16	0-2	12-14	16.5-18.5	0-2	10-12
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Perfluorooctanoic acids																				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	763051-92-9	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	6HPFHXSA	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA
3:3 FTCA	356-02-5	NS	NS	NS	mg/kg	NA	NA	<0.000978 U	NA	NA	NA	<0.000998 U	NA	NA	<0.000996 U	NA	NA	<0.000996 U	NA	NA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA
5:3 FTCA	914637-49-3	NS	NS	NS	mg/kg	NA	NA	<0.00489 U	NA	NA	NA	<0.00499 U	NA	NA	<0.00498 U	NA	NA	<0.00498 U	NA	NA
7:3 FTCA	812-70-4	NS	NS	NS	mg/kg	NA	NA	<0.00489 U	NA	NA	NA	<0.00499 U	NA	NA	<0.00498 U	NA	NA	<0.00498 U	NA	NA
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	756426-58-1	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
N-ethylperfluorooctane sulfonamide	4151-50-2	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
N-ethylperfluorooctane sulfonamidoe	1691-99-2	NS	NS	NS	mg/kg	NA	NA	<0.00196 U	NA	NA	NA	<0.002 U	NA	NA	<0.00199 U	NA	NA	<0.00199 U	NA	NA
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
N-methylperfluorooctane sulfonamide	31506-32-8	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
N-methylperfluorooctanesulfonamidol	24448-09-7	NS	NS	NS	mg/kg	NA	NA	<0.00196 U	NA	NA	NA	<0.002 U	NA	NA	<0.00199 U	NA	NA	<0.00199 U	NA	NA
Nonafluoro-3,6-dioxaheptanoic acid	151772-58-6	NS	NS	NS	mg/kg	NA	NA	<0.000391 U	NA	NA	NA	<0.000399 U	NA	NA	<0.000398 U	NA	NA	<0.000398 U	NA	NA
Perfluoro(2-ethoxyethane)sulfonic acid	113507-82-7	NS	NS	NS	mg/kg	NA	NA	<0.000391 U	NA	NA	NA	<0.000399 U	NA	NA	<0.000398 U	NA	NA	<0.000398 U	NA	NA
Perfluoro-3-methoxypropanoic acid	377-73-1	NS	NS	NS	mg/kg	NA	NA	<0.000391 U	NA	NA	NA	<0.000399 U	NA	NA	<0.000398 U	NA	NA	<0.000398 U	NA	NA
Perfluoro-4-methoxybutanoic acid	863090-89-5	NS	NS	NS	mg/kg	NA	NA	<0.000391 U	NA	NA	NA	<0.000399 U	NA	NA	<0.000398 U	NA	NA	<0.000398 U	NA	NA
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorododecanesulfonic Acid (PFDOS)	79780-39-5	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	0.001	0.044	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	0.000112 J	NA	NA
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0008	0.033	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluoropentanesulfonic Acid	2706-91-4	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	mg/kg	NA	NA	<0.000391 U	NA	NA	NA	<0.000399 U	NA	NA	<0.000398 U	NA	NA	<0.000398 U	NA	NA
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	mg/kg	NA	NA	<0.000196 U	NA	NA	NA	<0.0002 U	NA	NA	<0.000199 U	NA	NA	<0.000199 U	NA	NA
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA
Tetrafluoro-2- (heptafluoropropoxy) propanoic Acid	13252-13-6	NS	NS	NS	mg/kg	NA	NA	<0.000782 U	NA	NA	NA	<0.000798 U	NA	NA	<0.000796 U	NA	NA	<0.000797 U	NA	NA

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-19	LSB-20	LSB-20	LSB-20	LSB-20	LSB-20	LSB-21	LSB-21	LSB-21	LSB-22	LSB-22	LSB-22	LSB-23	LSB-23	LSB-23
					Sample Name	LSB19A_18-20	009_LSB-20A	010_LSB-20B	LSB20A_12-14	LSB20A_15-17	DUP01_04192023	066_LSB-21A	067_LSB-21B	068_LSB-21C	063_LSB-22A	064_LSB-22B	065_LSB-22C	069_LSB-23A	070_LSB-23B	071_LSB-23C
					Sample Date	04/19/2023	05/08/2018	05/08/2018	04/19/2023	04/19/2023	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021
					Sample Depth	18-20	0-2	9-11	12-14	15-17	15-17	0-2	5-7	12-14	0-2	4-6	13-15	0-2	8-10	18-20
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds																				
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,1,1-Trichloroethane	71-55-6	0.68	0.68	100	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	NS	NS	NS	mg/kg	NA	<0.0026 U	<0.0034 U	NA	NA	NA	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,1-Dichloroethane	75-34-3	0.27	0.27	26	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,1-Dichloroethene	75-35-4	0.33	0.33	100	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
1,1-Dichloropropene	563-58-6	NS	NS	NS	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	mg/kg	0.0022 J	NA	NA	<0.0022 U	<0.0024 U	<0.0022 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2,4-Trimethylbenzene	95-63-6	3.6	3.6	52	mg/kg	<0.0042 U	<0.0026 UJ	<0.0034 UJ	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	0.0068	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	NS	mg/kg	<0.0062 U	<0.0026 U	<0.0034 U	<0.0033 U	<0.0036 U	<0.0032 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2-Dichlorobenzene	95-50-1	1.1	1.1	100	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2-Dichloroethane	107-06-2	0.02	0.02	3.1	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,2-Dichloropropane	78-87-5	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	8.4	52	mg/kg	<0.0042 U	<0.0026 UJ	<0.0034 UJ	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	0.0036 J	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,3-Dichlorobenzene	541-73-1	2.4	2.4	49	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,3-Dichloropropane	142-28-9	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 UJ	<0.0034 UJ	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,4-Dichlorobenzene	106-46-7	1.8	1.8	13	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
1,4-Diethyl Benzene	105-05-5	NS	NS	NS	mg/kg	<0.0042 U	NA	NA	<0.0022 U	<0.0024 U	<0.0022 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	0.1	13	mg/kg	<0.17 U	<0.051 UJ	<0.068 UJ	<0.088 U	<0.097 U	<0.086 U	<0.042 U	<0.062 U	<0.047 U	<0.039 U	<0.046 U	<0.052 U	<0.039 U	<0.04 U	<0.054 U
2,2-Dichloropropane	594-20-7	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
2-Chlorotoluene	95-49-8	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
2-Hexanone (MBK)	591-78-6	NS	NS	NS	mg/kg	<0.021 U	<0.0026 U	<0.0034 U	<0.011 U	<0.012 U	<0.011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	0.0024 J	<0.0026 U	<0.0019 U	0.0051	<0.0027 U
4-Chlorotoluene	106-43-4	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
4-Ethyltoluene	622-96-8	NS	NS	NS	mg/kg	<0.0042 U	NA	NA	<0.0022 U	<0.0024 U	<0.0022 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	67-64-1	**0.05**	0.05	100	mg/kg	**0.11**	0.014 J	0.0096 J	0.0085 J	0.02	0.021	<0.0042 UJ	<0.0062 UJ	0.029 J	<0.0077 U	0.05 J	0.031 J	<0.0077 U	<0.014 U	**0.12 J**
Acrolein	107-02-8	NS	NS	NS	mg/kg	NA	<0.0051 U	<0.0068 U	NA	NA	NA	<0.0042 UJ	<0.0062 UJ	<0.0047 UJ	<0.0039 UJ	<0.0046 UJ	<0.0052 UJ	<0.0039 UJ	<0.004 UJ	<0.0054 UJ
Acrylonitrile	107-13-1	NS	NS	NS	mg/kg	<0.0083 U	<0.0026 U	<0.0034 U	<0.0044 U	<0.0048 U	<0.0043 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Benzene	71-43-2	0.06	0.06	4.8	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Bromobenzene	108-86-1	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Bromochloromethane	74-97-5	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Bromodichloromethane	75-27-4	NS	NS	NS	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Bromoform	75-25-2	NS	NS	NS	mg/kg	<0.0083 U	<0.0026 U	<0.0034 U	<0.0044 U	<0.0048 U	<0.0043 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Bromomethane	74-83-9	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Carbon Disulfide	75-15-0	NS	NS	NS	mg/kg	0.01 J	<0.0026 U	<0.0034 U	<0.011 U	<0.012 U	<0.011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	0.0032 J
Carbon Tetrachloride	56-23-5	0.76	0.76	2.4	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Chlorobenzene	108-90-7	1.1	1.1	100	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Chloroethane	75-00-3	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
Chloroform	67-66-3	0.37	0.37	49	mg/kg	<0.0031 U	<0.0026 U	<0.0034 U	0.00032 J	0.00062 J	0.00076 J	<0.0042 U	<0.0062 U	<0.0047 U	<0.0039 U	<0.0046 U	<0.0052 U	<0.0039 U	<0.004 U	<0.0054 U
Chloromethane	74-87-3	NS	NS	NS	mg/kg	<0.0083 U	<0.0026 U	<0.0034 U	<0.0044 U	<0.0048 U	<0.0043 U	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
Cis-1,2-Dichloroethene	156-59-2	0.25	0.25	100	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Cyclohexane	110-82-7	NS	NS	NS	mg/kg	NA	<0.0026 U	<0.0034 U	NA	NA	NA	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Cymene	99-87-6	NS	NS	NS	mg/kg	0.0021	NA	NA	<0.0011 U	<0.0012 U	<0.0011 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Dibromomethane	74-95-3	NS	NS	NS	mg/kg	<0.0042 U	<0.0026 UJ	<0.0034 UJ	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Dichlorodifluoromethane	75-71-8	NS	NS	NS	mg/kg	<0.021 U	<0.0026 U	<0.0034 U	<0.011 U	<0.012 U	<0.011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	NS	mg/kg	<0.0042 U	NA	NA	<0.0022 U	<0.0024 U	<0.0022 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	1	1	41	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Hexachlorobutadiene	87-68-3	NS	NS	NS	mg/kg	<0.0083 U	<0.0026 U	<0.0034 U	<0.0044 U	<0.0048 U	<0.0043 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
M,P-Xylene	179601-23-1	NS	NS	NS	mg/kg	<0.0042 U	<0.0051 U	<0.0068 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0042 U	<0.0062 U	<0.0047 U	<0.0039 U	<0.0046 U	<0.0052 U	<0.0039 U	<0.004 U	<0.0054 U
Methyl Acetate	79-20-9	NS	NS	NS	mg/kg	NA	<0.0026 U	<0.0034 U	NA	NA	NA	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	0.12	100	mg/kg	0.026	<0.0026 U	<0.0034 U	<0.011 U	<0.012 U	<0.011 U	<0.0021 UJ	<0.0031 UJ	0.003 J	<0.0019 UJ	0.018 J	0.0068 J	<0.0019 UJ	0.0069 J	0.033 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	NS	mg/kg	<0.021 U	<0.0026 U	<0.0034 U	<0.011 U	<0.012 U	<0.011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	0.0036 J	<0.0027 U
Methylcyclohexane	108-87-2	NS	NS	NS	mg/kg	NA	<0.0026 U	<0.0034 U	NA	NA	NA	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Methylene Chloride	75-09-2	0.05	0.05	100	mg/kg	<0.01 U	0.0075 J	<0.0068 UJ	<0.0055 U	<0.0061 U	<0.0054 U	0.0051 J	<0.0062 U	<0.0047 U	0.0048 J	<0.0046 U	<0.0052 U	<0.0039 U	0.0069 J	0.0072 J
Naphthalene	91-20-3	12	12	100	mg/kg	0.0015 J	NA	NA	<0.0044 U	<0.0048 U	<0.0043 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	104-51-8	12	12	100	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
n-Propylbenzene	103-65-1	3.9	3.9	100	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
p-Cymene (p-Isopropyltoluene)	CYMP	NS	NS	NS	mg/kg	NA	<0.0026 UJ	<0.0034 UJ	NA	NA	NA	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Sec-Butylbenzene	135-98-8	11	11	100	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Styrene	100-42-5	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
T-Butylbenzene	98-06-6	5.9	5.9	100	mg/kg	0.00044 J	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Tert-Butyl Alcohol	75-65-0	NS	NS	NS	mg/kg	NA	<0.0026 U	<0.0034 U	NA	NA	NA	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
Tert-Butyl Methyl Ether	1634-04-4	0.93	0.93	100	mg/kg	<0.0042 U	<0.0026 U	<0.0034 U	<0.0022 U	<0.0024 U	<0.0022 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Tetrachloroethene (PCE)	127-18-4	1.3	1.3	19	mg/kg	<0.001 U	<0.0026 U	<0.0034 U	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
Toluene	108-88-3	0.7	0.7	100	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	NS	mg/kg	<0.0021 U	NA	NA	<0.0011 U	<0.0012 U	<0.0011 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	0.26	1.6	100	mg/kg	<0.0021 U	<0.0077 U	<0.01 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0063 U	<0.0093 U	<0.0071 U	<0.0058 U	<0.0069 U	<0.0078 U	<0.0058 U	<0.006 U	<0.0081 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	NS	mg/kg	<0.001 U	NA	NA	<0.00055 U	<0.00061 U	<0.00054 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trans-1,2-Dichloroethene	156-60-5	0.19	0.19	100	mg/kg	<0.0031 U	<0.0026 U	<0.0034 U	<0.0016 U	<0.0018 U	<0.0016 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	NS	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	NS	mg/kg	<0.01 U	NA	NA	<0.0055 U	<0.0061 U	<0.0054 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene (TCE)	79-01-6	0.47	0.47	21	mg/kg	<0.001 U	<0.0026 UJ	<0.0034 UJ	<0.00055 U	<0.00061 U	<0.00054 U	<0.0021 U	<0.0031 U	<0.0024 U	<0.0019 U	<0.0023 U	<0.0026 U	<0.0019 U	<0.002 U	<0.0027 U
Trichlorofluoromethane	75-69-4	NS	NS	NS	mg/kg	<0.0083 U	<0.0026 U	<0.0034 U	<0.0044 U	<0.0048 U	<0.0043 U	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ
Vinyl Acetate	108-05-4	NS	NS	NS	mg/kg	<0.021 U	NA	NA	<0.011 U	<0.012 U	<0.011 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	75-01-4	0.02	0.02	0.9	mg/kg	<0.0021 U	<0.0026 U	<0.0034 U	<0.0011 U	<0.0012 U	<0.0011 U	<0.0021 UJ	<0.0031 UJ	<0.0024 UJ	<0.0019 UJ	<0.0023 UJ	<0.0026 UJ	<0.0019 UJ	<0.002 UJ	<0.0027 UJ

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-19	LSB-20	LSB-20	LSB-20	LSB-20	LSB-20	LSB-21	LSB-21	LSB-21	LSB-22	LSB-22	LSB-22	LSB-23	LSB-23	LSB-23
					Sample Name	LSB19A_18-20	009_LSB-20A	010_LSB-20B	LSB20A_12-14	LSB20A_15-17	DUP01_04192023	066_LSB-21A	067_LSB-21B	068_LSB-21C	063_LSB-22A	064_LSB-22B	065_LSB-22C	069_LSB-23A	070_LSB-23B	071_LSB-23C
					Sample Date	04/19/2023	05/08/2018	05/08/2018	04/19/2023	04/19/2023	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021
					Sample Depth	18-20	0-2	9-11	12-14	15-17	15-17	0-2	5-7	12-14	0-2	4-6	13-15	0-2	8-10	18-20
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds																				
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	mg/kg	<0.34 U	<0.0894 U	<0.099 U	<0.21 U	<0.22 U	<0.22 U	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 U	<0.11 U	<0.663 U	<0.859 U	<0.11 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
1,2-Dichlorobenzene	95-50-1	1.1	1.1	100	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
1,2-Diphenylhydrazine	122-66-7	NS	NS	NS	mg/kg	NA	<0.0448 UJ	<0.0496 UJ	NA	NA	NA	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
1,3-Dichlorobenzene	541-73-1	2.4	2.4	49	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
1,4-Dichlorobenzene	106-46-7	1.8	1.8	13	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	0.1	13	mg/kg	<0.051 U	NA	NA	<0.032 U	<0.034 U	<0.032 U	<0.00971 U	<0.00952 U	<0.00962 U	<0.0098 U	<0.0098 U	<0.00962 U	<0.00917 U	<0.00935 U	<0.00962 U
2,3,4,6-Tetrachlorophenol	58-90-2	NS	NS	NS	mg/kg	NA	<0.0894 U	<0.099 U	NA	NA	NA	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 UJ	<0.11 U	<0.663 U	<0.859 U	<0.11 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	mg/kg	<0.2 U	<0.0448 U	<0.0496 U	<0.13 U	<0.13 U	<0.13 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2,4-Dichlorophenol	120-83-2	NS	NS	NS	mg/kg	<0.31 U	<0.0448 U	<0.0496 U	<0.19 U	<0.2 U	<0.19 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2,4-Dimethylphenol	105-67-9	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2,4-Dinitrophenol	51-28-5	NS	NS	NS	mg/kg	<1.6 U	<0.0894 UJ	<0.099 UJ	<1 U	<1.1 U	<1 U	<0.0923 UJ	<0.103 UJ	<0.0969 UJ	<0.0888 UJ	<0.434 UJ	<0.11 UJ	<0.663 UJ	<0.859 UJ	<0.11 UJ
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	mg/kg	<0.34 U	<0.0448 UJ	<0.0496 UJ	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	mg/kg	<0.34 U	<0.0448 UJ	<0.0496 UJ	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2-Chloronaphthalene	91-58-7	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2-Chlorophenol	95-57-8	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2-Methylnaphthalene	91-57-6	NS	NS	NS	mg/kg	0.053 J	<0.0448 U	<0.0496 U	<0.26 U	<0.27 U	<0.26 U	<0.0463 U	<0.0518 U	0.0961 JD	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2-Methylphenol (o-Cresol)	95-48-7	0.33	0.33	100	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
2-Nitroaniline	88-74-4	NS	NS	NS	mg/kg	<0.34 U	<0.0894 UJ	<0.099 UJ	<0.21 U	<0.22 U	<0.22 U	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 U	<0.11 U	<0.663 U	<0.859 U	<0.11 U
2-Nitrophenol	88-75-5	NS	NS	NS	mg/kg	<0.74 U	<0.0448 UJ	<0.0496 UJ	<0.46 U	<0.48 U	<0.47 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	0.33	0.33	100	mg/kg	0.26 J	<0.0448 U	<0.0496 U	<0.31 U	<0.32 U	<0.31 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	0.156 D	<0.332 U	<0.43 U	<0.0552 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
3-Nitroaniline	99-09-2	NS	NS	NS	mg/kg	<0.34 U	<0.0894 UJ	<0.099 UJ	<0.21 U	<0.22 U	<0.22 U	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 U	<0.11 U	<0.663 U	<0.859 U	<0.11 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	NS	mg/kg	<0.89 U	<0.0894 UJ	<0.099 UJ	<0.56 U	<0.58 U	<0.56 U	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 UJ	<0.11 U	<0.663 U	<0.859 U	<0.11 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
4-Chloroaniline	106-47-8	NS	NS	NS	mg/kg	<0.34 UJ	<0.0448 U	<0.0496 U	<0.21 UJ	<0.22 UJ	<0.22 UJ	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
4-Nitroaniline	100-01-6	NS	NS	NS	mg/kg	<0.34 U	<0.0894 UJ	<0.099 UJ	<0.21 U	<0.22 U	<0.22 U	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 U	<0.11 U	<0.663 U	<0.859 U	<0.11 U
4-Nitrophenol	100-02-7	NS	NS	NS	mg/kg	<0.48 U	<0.0894 U	<0.099 U	<0.3 U	<0.31 U	<0.3 U	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 UJ	<0.11 U	<0.663 U	<0.859 U	<0.11 U
Acenaphthene	83-32-9	20	98	100	mg/kg	<0.27 U	<0.0448 U	<0.0496 U	<0.17 U	<0.18 U	0.032 J	<0.0463 U	<0.0518 U	0.122 D	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Acenaphthylene	208-96-8	100	107	100	mg/kg	<0.27 U	0.0879 JDE	<0.0496 U	<0.17 U	<0.18 U	0.039 J	0.258 D	<0.0518 U	0.0899 JD	0.0468 JD	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Acetophenone	98-86-2	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Aniline (Phenylamine, Aminobenzene)	62-53-3	NS	NS	NS	mg/kg	NA	<0.179 U	<0.198 U	NA	NA	NA	<0.185 U	<0.207 U	<0.194 U	<0.178 U	<0.87 U	<0.22 U	<1.33 U	<1.72 U	<0.221 U
Anthracene	120-12-7	100	1000	100	mg/kg	<0.2 U	0.132 DE	<0.0496 U	<0.13 U	<0.13 U	0.22	0.39 D	<0.0518 U	0.358 D	0.0461 JD	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Atrazine	1912-24-9	NS	NS	NS	mg/kg	NA	<0.0448 U	<0.0496 U	NA	NA	NA	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Benzaldehyde	100-52-7	NS	NS	NS	mg/kg	NA	<0.0448 UJ	<0.0496 UJ	NA	NA	NA	0.0649 JD	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	1.14 D
Benzidine	92-87-5	NS	NS	NS	mg/kg	NA	<0.179 U	<0.198 U	NA	NA	NA	<0.185 UJ	<0.207 UJ	<0.194 UJ	<0.178 UJ	<0.87 UJ	<0.22 UJ	<1.33 UJ	<1.72 UJ	<0.221 UJ
Benzo(a)anthracene	56-55-3	**1**	1	1	mg/kg	0.12 J	0.565 DE	0.122 DE	0.14	<0.13 UJ	0.39 J	0.885 D	0.0587 JD	0.635 D	0.221 D	0.358 JD	0.0721 JD	0.863 D	<0.43 U	0.0687 JD
Benzo(a)pyrene	50-32-8	**1**	22	1	mg/kg	0.096 J	0.588 DE	0.112 DE	0.12 J	<0.18 U	0.3	**1.09 D**	0.0678 JD	0.662 D	0.285 D	0.413 JD	0.0703 JD	0.911 D	<0.43 U	0.0678 JD
Benzo(b)fluoranthene	205-99-2	**1**	1.7	1	mg/kg	0.11 J	0.473 DE	0.0973 JDE	0.15	<0.13 U	0.34	**1.15 D**	0.0554 JD	0.487 D	0.283 D	0.392 JD	0.0651 JD	0.848 D	<0.43 U	0.066 JD
Benzo(g,h,i)Perylene	191-24-2	100	1000	100	mg/kg	0.06 J	0.433 DE	0.0878 JDE	0.088 J	<0.18 U	0.14 J	0.66 D	<0.0518 U	0.359 D	0.193 D	0.368 JD	<0.0551 U	0.583 JD	<0.43 U	<0.0552 U
Benzo(k)fluoranthene	207-08-9	**0.8**	1.7	3.9	mg/kg	<0.2 U	0.468 DE	0.0933 JDE	0.043 J	<0.13 U	0.12 J	**0.908 D**	0.0521 JD	0.428 D	0.228 D	0.33 JD	0.0615 JD	0.683 D	<0.43 U	0.059 JD
Benzoic Acid	65-85-0	NS	NS	NS	mg/kg	<1.1 U	<0.0448 U	<0.0496 U	<0.69 U	<0.72 U	<0.7 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Benzyl Alcohol	100-51-6	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	0.0605 JD	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	NS	mg/kg	<0.78 U	<0.0448 U	<0.0496 U	<0.49 U	<0.51 U	<0.49 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	NS	mg/kg	<0.37 U	<0.0448 U	<0.0496 U	<0.23 U	<0.24 U	<0.23 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	NS	mg/kg	<0.31 U	<0.0448 U	<0.0496 U	<0.19 U	<0.2 U	<0.19 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	NS	mg/kg	<0.41 U	<0.0448 UJ	<0.0496 UJ	<0.26 U	<0.27 U	<0.26 U	<0.0463 UJ	<0.0518 UJ	<0.0486 UJ	<0.0445 UJ	<0.218 UJ	<0.0551 UJ	<0.332 UJ	<0.43 UJ	<0.0552 UJ
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	NS	mg/kg	<0.34 U	0.112 DE	0.0704 JDE	<0.21 U	<0.22 U	<0.22 U	0.0952 D	<0.0518 U	<0.0486 U	2.65 D	2.45 D	0.188 D	0.482 JD	<0.43 U	0.0616 JD
Caprolactam	105-60-2	NS	NS	NS	mg/kg	NA	<0.0894 U	<0.099 U	NA	NA	NA	<0.0923 U	<0.103 U	<0.0969 U	<0.0888 U	<0.434 U	<0.11 U	<0.663 U	<0.859 U	<0.11 U
Carbazole	86-74-8	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	0.022 J	0.161 D	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Chrysene	218-01-9	**1**	1	3.9	mg/kg	0.12 J	0.521 DE	0.108 DE	0.13	<0.13 UJ	0.4 J	0.914 D	0.0653 JD	0.712 D	0.238 D	0.455 D	0.0809 JD	0.789 D	<0.43 U	0.074 JD
Dibenz(a,h)anthracene	53-70-3	**0.33**	1000	0.33	mg/kg	<0.2 U	0.127 J	<0.0496 UJ	<0.13 U	<0.13 U	0.033 J	0.217 D	<0.0518 U	0.126 D	0.0511 JD	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Dibenzofuran	132-64-9	7	210	59	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	0.023 J	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Dibutyl phthalate	84-74-2	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Diethyl phthalate	84-66-2	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Dimethyl phthalate	131-11-3	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Dioctyl phthalate	117-84-0	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	0.126 D	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Fluoranthene	206-44-0	100	1000	100	mg/kg	0.2	0.786 DE	0.183 DE	0.26	<0.13 UJ	0.87 J	1.35 D	0.0984 JD	1.27 D	0.348 D	0.701 D	0.148 D	1.3 D	<0.43 U	0.118 D
Fluorene	86-73-7	30	386	100	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	0.075 J	0.0642 JD	<0.0518 U	0.212 D	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Hexachlorobenzene	118-74-1	0.33	3.2	1.2	mg/kg	<0.2 U	<0.0448 U	<0.0496 U	<0.13 U	<0.13 U	<0.13 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Hexachlorobutadiene	87-68-3	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	mg/kg	<0.98 U	<0.0448 U	<0.0496 U	<0.61 U	<0.64 U	<0.62 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Hexachloroethane	67-72-1	NS	NS	NS	mg/kg	<0.27 U	<0.0448 U	<0.0496 U	<0.17 U	<0.18 U	<0.17 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	8.2	0.5	mg/kg	0.064 J	0.342 J	0.0696 J	0.083 J	<0.18 U	0.16 J	**0.759 D**	<0.0518 U	0.383 D	0.174 D	0.292 JD	<0.0551 U	**0.583 JD**	<0.43 U	<0.0552 U
Isophorone	78-59-1	NS	NS	NS	mg/kg	<0.31 U	<0.0448 U	<0.0496 U	<0.19 U	<0.2 U	<0.19 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Naphthalene	91-20-3	12	12	100	mg/kg	0.2 J	<0.0448 U	<0.0496 U	0.037 J	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	0.249 D	<0.0445 U	<0.218 U	0.255 D	<0.332 U	<0.43 U	0.0828 JD
Nitrobenzene	98-95-3	NS	NS	NS	mg/kg	<0.31 U	<0.0448 U	<0.0496 U	<0.19 U	<0.2 U	<0.19 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
n-Nitrosodimethylamine	62-75-9	NS	NS	NS	mg/kg	NA	<0.0448 U	<0.0496 U	NA	NA	NA	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	NS	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	NS	mg/kg	<0.27 U	<0.0448 U	<0.0496 U	<0.17 U	<0.18 U	<0.17 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 U	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Pentachlorophenol	87-86-5	0.8	0.8	6.7	mg/kg	<0.27 U	<0.0448 U	<0.0496 U	<0.17 U	<0.18 U	<0.17 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Phenanthrene	85-01-8	100	1000	100	mg/kg	0.15 J	0.358 DE	0.128 DE	0.16	<0.13 UJ	1 J	0.518 D	<0.0518 U	1.33 D	0.14 D	0.295 JD	0.15 D	0.514 JD	<0.43 U	0.0819 JD
Phenol	108-95-2	0.33	0.33	100	mg/kg	<0.34 U	<0.0448 U	<0.0496 U	<0.21 U	<0.22 U	<0.22 U	<0.0463 U	<0.0518 U	<0.0486 U	<0.0445 U	<0.218 UJ	<0.0551 U	<0.332 U	<0.43 U	<0.0552 U
Pyrene	129-00-0	100	1000	100	mg/kg	0.18 J	0.949 DE	0.221 DE	0.24	<0.13 UJ	0.84 J	1.38 D	0.0884 JD	1.51 D	0.328 D	1.12 D	0.137 D	1.23 D	<0.43 U	0.109 JD
Pyridine	110-86-1	NS	NS	NS	mg/kg	NA	<0.179 U	<0.198 U	NA	NA	NA	<0.185 U	<0.207 U	<0.194 U	<0.178 U	<0.87 U	<0.22 U	<1.33 U	<1.72 U	<0.221 U

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-19	LSB-20	LSB-20	LSB-20	LSB-20	LSB-20	LSB-21	LSB-21	LSB-21	LSB-22	LSB-22	LSB-22	LSB-23	LSB-23	LSB-23
					Sample Name	LSB19A_18-20	009_LSB-20A	010_LSB-20B	LSB20A_12-14	LSB20A_15-17	DUP01_04192023	066_LSB-21A	067_LSB-21B	068_LSB-21C	063_LSB-22A	064_LSB-22B	065_LSB-22C	069_LSB-23A	070_LSB-23B	071_LSB-23C
					Sample Date	04/19/2023	05/08/2018	05/08/2018	04/19/2023	04/19/2023	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021
					Sample Depth	18-20	0-2	9-11	12-14	15-17	15-17	0-2	5-7	12-14	0-2	4-6	13-15	0-2	8-10	18-20
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Pesticides																				
4,4'-DDD	72-54-8	**0.0033**	14	13	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	**0.00928 D**	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
4,4'-DDE	72-55-9	**0.0033**	17	8.9	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	0.000841 J	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	**0.0092 D**	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
4,4'-DDT	50-29-3	**0.0033**	136	7.9	mg/kg	<0.00314 U	**0.0112 J**	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	**0.0066 D**	<0.00203 U	<0.0019 U	**0.00506 D**	**0.0447 D**	<0.00217 U	**0.00489 D**	**0.00601 D**	<0.00219 U
Aldrin	309-00-2	0.005	0.19	0.097	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.02	0.48	mg/kg	<0.00131 U	<0.00177 UJ	<0.00196 U	<0.000837 U	<0.000898 U	<0.00088 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Alpha Chlordane	5103-71-9	0.094	2.9	4.2	mg/kg	<0.00393 U	0.0639 J	<0.00196 U	0.00498 J	0.00159 J	<0.00264 U	0.025 D	<0.00203 U	<0.0019 U	0.0418 D	<0.00169 U	<0.00217 U	0.0139 D	<0.00165 U	<0.00219 U
Alpha Endosulfan	959-98-8	2.4	102	24	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.09	0.36	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Beta Endosulfan	33213-65-9	2.4	102	24	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	NS	mg/kg	<0.0262 U	0.102 J	<0.0391 U	0.0371 J	<0.018 U	<0.0176 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	0.25	100	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Dieldrin	60-57-1	**0.005**	0.1	0.2	mg/kg	<0.00196 U	0.00434 J	<0.00196 U	<0.00126 U	<0.00135 U	<0.00132 U	<0.00184 U	<0.00203 U	<0.0019 U	**0.00944 D**	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Endosulfan Sulfate	1031-07-8	2.4	1000	24	mg/kg	<0.00131 U	<0.00177 UJ	<0.00196 U	<0.000837 U	<0.000898 U	<0.00088 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Endrin	72-20-8	0.014	0.06	11	mg/kg	<0.00131 U	<0.00177 UJ	<0.00196 U	<0.000837 U	<0.000898 U	<0.00088 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Endrin Aldehyde	7421-93-4	NS	NS	NS	mg/kg	<0.00393 U	<0.00177 UJ	<0.00196 U	<0.00251 U	<0.00269 U	<0.00264 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Endrin Ketone	53494-70-5	NS	NS	NS	mg/kg	<0.00314 U	<0.00177 UJ	<0.00196 U	<0.00201 U	<0.00216 U	<0.00211 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Gamma Bhc (Lindane)	58-89-9	0.1	0.1	1.3	mg/kg	<0.00131 U	<0.00177 UJ	<0.00196 U	<0.000837 U	<0.000898 U	<0.00088 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Gamma Chlordane (Trans)	5103-74-2	NS	NS	NS	mg/kg	<0.00393 U	NA	NA	0.00763 J	0.000764 J	<0.00264 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	5566-34-7	NS	NS	NS	mg/kg	NA	0.0384 J	<0.00196 U	NA	NA	NA	0.0198 D	<0.00203 U	<0.0019 U	0.0286 D	<0.00169 U	<0.00217 U	0.0136 D	<0.00165 U	<0.00219 U
Heptachlor	76-44-8	0.042	0.38	2.1	mg/kg	<0.00157 U	0.00862 J	<0.00196 U	0.00103	<0.00108 U	<0.00106 U	<0.00184 U	<0.00203 U	<0.0019 U	0.00461 D	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Heptachlor Epoxide	1024-57-3	NS	NS	NS	mg/kg	<0.0059 U	<0.00177 UJ	<0.00196 U	<0.00376 U	<0.00404 U	<0.00396 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Methoxychlor	72-43-5	NS	NS	NS	mg/kg	<0.0059 U	<0.00886 UJ	<0.00978 U	<0.00376 U	<0.00404 U	<0.00396 U	<0.00184 U	<0.00203 U	<0.0019 U	<0.00173 U	<0.00169 U	<0.00217 U	<0.00175 U	<0.00165 U	<0.00219 U
Toxaphene	8001-35-2	NS	NS	NS	mg/kg	<0.059 U	<0.0897 UJ	<0.099 U	<0.0376 U	<0.0404 U	<0.0396 U	<0.184 U	<0.203 U	<0.19 U	<0.173 U	<0.169 U	<0.217 U	<0.175 U	<0.165 U	<0.219 U
Herbicides																				
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	NS	mg/kg	<0.338 U	NA	NA	<0.213 U	<0.227 U	<0.218 U	<0.0223 U	<0.0246 U	<0.0229 U	<0.0213 U	<0.0207 U	<0.0264 U	<0.0209 U	<0.0205 U	<0.0263 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	NS	mg/kg	<0.338 U	NA	NA	<0.213 U	<0.227 U	<0.218 U	<0.0223 U	<0.0246 U	<0.0229 U	<0.0213 U	<0.0207 U	<0.0264 U	<0.0209 U	<0.0205 U	<0.0263 U
Silvex (2,4,5-Tp)	93-72-1	3.8	3.8	100	mg/kg	<0.338 U	NA	NA	<0.213 U	<0.227 U	<0.218 U	<0.0223 U	<0.0246 U	<0.0229 U	<0.0213 U	<0.0207 U	<0.0264 U	<0.0209 U	<0.0205 U	<0.0263 U
Polychlorinated Biphenyl																				
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	NS	mg/kg	<0.0978 U	<0.0179 U	<0.0198 U	<0.0618 U	<0.0641 U	<0.0661 U	<0.0186 U	<0.0205 U	<0.0192 U	<0.0175 U	<0.0854 U	<0.0219 U	<0.0176 U	<0.0167 U	<0.0221 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	NS	mg/kg	<0.0978 U	<0.0179 U	<0.0198 U	<0.0618 U	<0.0641 U	<0.0661 U	<0.0186 U	<0.0205 U	<0.0192 U	<0.0175 U	<0.0854 U	<0.0219 U	<0.0176 U	<0.0167 U	<0.0221 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	NS	mg/kg	<0.0978 U	<0.0179 U	<0.0198 U	<0.0618 U	<0.0641 U	<0.0661 U	<0.0186 U	<0.0205 U	<0.0192 U	<0.0175 U	<0.0854 U	<0.0219 U	<0.0176 U	<0.0167 U	<0.0221 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	NS	mg/kg	<0.0978 U	<0.0179 U	<0.0198 U	<0.0618 U	<0.0641 U	<0.0661 U	<0.0186 U	<0.0205 U	<0.0192 U	<0.0175 U	<0.0854 U	<0.0219 U	<0.0176 U	<0.0167 U	<0.0221 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	NS	mg/kg	<0.0978 U	<0.0179 U	<0.0198 U	<0.0618 U	<0.0641 U	<0.0661 U	<0.0186 U	<0.0205 U	<0.0192 U	<0.0175 U	1.97 D	<0.0219 U	<0.0176 U	<0.0167 U	<0.0221 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	NS	mg/kg	0.027 J	<0.0179 U	<0.0198 U	0.0424 J	<0.0641 U	<0.0661 U	<0.0186 U	<0.0205 U	<0.0192 U	<0.0175 U	<0.0854 U	<0.0219 U	<0.0176 U	<0.0167 U	<0.0221 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	NS	mg/kg	0.0221 J	<0.0179 U	<0.0198 U	0.0245 J	<0.0641 U	<0.0661 U	0.0731	<0.0205 U	<0.0192 U	0.0301	0.416 D	<0.0219 U	0.0579	0.0354	<0.0221 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	NS	mg/kg	<0.0978 U	NA	NA	<0.0618 U	<0.0641 U	<0.0661 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	NS	mg/kg	0.0549 J	NA	NA	0.0242 J	<0.0641 U	<0.0661 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	1336-36-3	**0.1**	3.2	1	mg/kg	**0.104 J**	<0.0179 U	<0.0198 U	0.0911 J	<0.0641 U	<0.0661 U	0.0731	<0.0205 U	<0.0192 U	0.0301	**2.39 D**	<0.0219 U	0.0579	0.0354	<0.0221 U
Metals																				
Aluminum	7429-90-5	NS	NS	NS	mg/kg	3,200	6,690	2,730	3,220	7,330	5,810	6,490	6,270	6,680	5,900	3,760	5,630	7,740	2,590	9,360
Antimony	7440-36-0	NS	NS	NS	mg/kg	1.86 J	<0.54 U	0.934	1.39 J	0.884 J	1.66 J	<2.8 U	18.5 J	<2.91 U	<2.68 U	<2.61 U	<3.31 U	<2.67 U	<2.58 U	<3.37 U
Arsenic	7440-38-2	**13**	16	16	mg/kg	10.2	4.82	<1.19 U	8.13	4.2	6.15	5.68	7.69	3.64	5.67	4.58	10.8	3.98	<1.55 U	5.62
Barium	7440-39-3	**350**	820	400	mg/kg	**527**	101	330	**360**	13.2	17.3	231	**801**	**365**	85.6	87	**1,280**	194	44.8	**1,190**
Beryllium	7440-41-7	7.2	47	72	mg/kg	0.461 J	0.249	0.309	0.514	0.437 J	0.478 J	<0.056 U	0.116	0.277	<0.054 U	<0.052 U	0.264	<0.053 U	<0.052 U	<0.067 U
Cadmium	7440-43-9	**2.5**	7.5	4.3	mg/kg	**4.71**	0.431	1.51	0.582 J	**9.16 J**	**17.8 J**	1.79	<0.374 U	<0.35 U	0.419	0.773	0.989	0.98	<0.31 U	**3.58**
Calcium	7440-70-2	NS	NS	NS	mg/kg	4,210	32,400	4,370	2,120	530	652	29,100	2,320	5,080	31,500	64,200	3,050	18,300	36,800	3,660
Chromium, Hexavalent	18540-29-9	1	19	110	mg/kg	<1.64 U	<0.54 U	<0.596 U	0.296 J	0.301 J	<1.07 U	<0.561 U	<0.624 U	<0.583 U	<0.536 U	<0.523 U	<0.662 U	<0.535 U	<0.517 U	<0.674 U
Chromium, Total	7440-47-3	NS	NS	NS	mg/kg	23.7	17.3	74.6	15.2	16.2	19.5	21.3	23.7	15.2	19.2	34	30.7	26.9	10.2	36.7
Chromium, Trivalent	16065-83-1	**30**	NS	180	mg/kg	23.7	17.3	**74.6**	14.9 J	15.9 J	19.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	NS	NS	NS	mg/kg	6.06	5.54	22.2	4.38	5.25	7.87	6.22	6.06	7.01	4.95	5.69	6.73	6.64	2.33	5.71
Copper	7440-50-8	**50**	1720	270	mg/kg	**77.9**	34.6	**319**	**63.4**	13.9 J	34 J	**133**	**111**	43.5	27.2	**88.8**	**56**	**69.3**	7.35	**2,380**
Cyanide	57-12-5	27	40	27	mg/kg	1.1 J	NA	NA	0.41 J	0.38 J	<1.2 U	<0.561 U	<0.624 U	<0.583 U	<0.536 U	<0.523 U	<0.662 U	<0.535 U	<0.517 U	<0.674 U
Iron	7439-89-6	NS	NS	NS	mg/kg	19,700	11,300	86,300	9,070	16,100 J	28,700 J	22,800	9,120	15,400	10,800	21,200	7,590	17,600	5,780	13,800
Lead	7439-92-1	**63**	450	400	mg/kg	**1,240**	**130**	**543**	**183**	28.8 J	**64.9 J**	**340**	**4,030**	**150**	**91.8**	**190**	**580**	**287**	8.64	**1,360**
Magnesium	7439-95-4	NS	NS	NS	mg/kg	393	6,970	562	407	3,810 J	1,480 J	13,900	457	978	6,860	15,400	1,510	7,480	16,200	1,140
Manganese	7439-96-5	1600	2000	2000	mg/kg	151	201	405	47.5	64.7	107	236	69.7	117	160	188	93.4	233	108	117
Mercury	7439-97-6	**0.18**	0.73	0.81	mg/kg	**0.291**	**0.183**	**1.53**	**0.379**	<0.09 U	<0.086 U	**0.468**	**0.304**	0.074	**0.19**	0.0786	**1.22**	**0.424**	<0.031 U	**5.92**
Nickel	7440-02-0	**30**	130	310	mg/kg	13.5	20	**52.7**	13	**38.6**	27.8	26.6	15.8	16.2	20.2	22.5	20.3	24.7	16.9	16.9
Potassium	7440-09-7	NS	NS	NS	mg/kg	<386 U	864	276	327	279	266	695 B	503 B	954 B	1,230 B	676 B	622 B	1,150 B	1,190 B	610 B
Selenium	7782-49-2	**3.9**	4	180	mg/kg	0.796 J	<1.08 U	<1.19 U	0.993 J	0.602 J	0.408 J	<2.8 U	<3.12 U	<2.91 U	<2.68 U	<2.61 U	<3.31 U	<2.67 U	**11.3 J**	<3.37 U
Silver	7440-22-4	**2**	8.3	180	mg/kg	<0.772 U	<0.54 U	1.75	<0.488 U	<0.517 U	<0.507 U	<0.561 U	<0.624 U	<0.583 U	<0.536 U	<0.523 U	<0.662 U	<0.535 U	<0.517 U	**2.1**
Sodium	7440-23-5	NS	NS	NS	mg/kg	<309 U	189	106	<195 U	<207 U	<203 U	209	241	224	134	162	453	220	301	691
Thallium	7440-28-0	NS	NS	NS	mg/kg	<3.09 U	<1.08 U	<1.19 U	<1.95 U	0.36 J	0.406 J	<2.8 U	<3.12 U	<2.91 U	<2.68 U	<2.61 U	<3.31 U	<2.67 U	<2.58 U	<3.37 U
Vanadium	7440-62-2	NS	NS	NS	mg/kg	18	19.9	17.2	23.7	17.2	16	30.8	26.2	32.8	28.6	27	24.9	33.7	93.5	24.1
Zinc	7440-66-6	**109**	2480	10000	mg/kg	**1,100**	**135**	**423**	**245**	**704 J**	**1,500 J**	**634**	103	**169**	97.9	**139**	**719**	**325**	14	**589**
General Chemistry																				
Total Solids	TSOLID	NS	NS	NS	Percent	48.7	92.7	83.9	77.6	73	74.8	89.2	80.1	85.8	93.3	95.7	75.6	93.5	96.8	74.2

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-19	LSB-20	LSB-20	LSB-20	LSB-20	LSB-20	LSB-21	LSB-21	LSB-21	LSB-22	LSB-22	LSB-22	LSB-23	LSB-23	LSB-23
					Sample Name	LSB19A_18-20	009_LSB-20A	010_LSB-20B	LSB20A_12-14	LSB20A_15-17	DUP01_04192023	066_LSB-21A	067_LSB-21B	068_LSB-21C	063_LSB-22A	064_LSB-22B	065_LSB-22C	069_LSB-23A	070_LSB-23B	071_LSB-23C
					Sample Date	04/19/2023	05/08/2018	05/08/2018	04/19/2023	04/19/2023	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021
					Sample Depth	18-20	0-2	9-11	12-14	15-17	15-17	0-2	5-7	12-14	0-2	4-6	13-15	0-2	8-10	18-20
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Perfluorooctanoic acids																				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	763051-92-9	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	6HPFHXSA	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
3:3 FTCA	356-02-5	NS	NS	NS	mg/kg	<0.00099 U	NA	NA	<0.000967 U	<0.00099 U	<0.000982 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
5:3 FTCA	914637-49-3	NS	NS	NS	mg/kg	<0.00495 U	NA	NA	<0.00484 U	<0.00495 U	<0.00491 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
7:3 FTCA	812-70-4	NS	NS	NS	mg/kg	<0.00495 U	NA	NA	<0.00484 U	<0.00495 U	<0.00491 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	756426-58-1	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
N-ethylperfluorooctane sulfonamide	4151-50-2	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethylperfluorooctane sulfonamidoe	1691-99-2	NS	NS	NS	mg/kg	<0.00198 U	NA	NA	<0.00193 U	<0.00198 U	<0.00196 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
N-methylperfluorooctane sulfonamide	31506-32-8	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methylperfluorooctanesulfonamidol	24448-09-7	NS	NS	NS	mg/kg	<0.00198 U	NA	NA	<0.00193 U	<0.00198 U	<0.00196 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nonafluoro-3,6-dioxaheptanoic acid	151772-58-6	NS	NS	NS	mg/kg	<0.000396 U	NA	NA	<0.000387 U	<0.000396 U	<0.000393 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro(2-ethoxyethane)sulfonic acid	113507-82-7	NS	NS	NS	mg/kg	<0.000396 U	NA	NA	<0.000387 U	<0.000396 U	<0.000393 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-3-methoxypropanoic acid	377-73-1	NS	NS	NS	mg/kg	<0.000396 U	NA	NA	<0.000387 U	<0.000396 U	<0.000393 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-4-methoxybutanoic acid	863090-89-5	NS	NS	NS	mg/kg	<0.000396 U	NA	NA	<0.000387 U	<0.000396 U	<0.000393 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	0.000786	0.00069	<0.000477 U	0.00197
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorododecanesulfonic Acid (PFDOS)	79780-39-5	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	0.001	0.044	mg/kg	0.000103 J	NA	NA	0.000108 J	<0.000198 U	<0.000196 U	**0.00134**	<0.000591 U	<0.000564 U	**0.00214**	<0.0005 U	<0.000627 U	**0.00147**	<0.000477 U	<0.000653 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0008	0.033	mg/kg	0.000071 J	NA	NA	0.000124 J	<0.000198 U	<0.000196 U	0.00057	**0.000683**	0.00059	0.000577	<0.0005 U	<0.000627 U	**0.00109**	<0.000477 U	<0.000653 U
Perfluoropentanesulfonic Acid	2706-91-4	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	mg/kg	<0.000396 U	NA	NA	<0.000387 U	<0.000396 U	<0.000393 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	mg/kg	<0.000198 U	NA	NA	<0.000193 U	<0.000198 U	<0.000196 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	<0.00051 U	<0.000591 U	<0.000564 U	<0.000512 U	<0.0005 U	<0.000627 U	<0.000514 U	<0.000477 U	<0.000653 U
Tetrafluoro-2- (heptafluoropropoxy) propanoic Acid	13252-13-6	NS	NS	NS	mg/kg	<0.000792 U	NA	NA	<0.000774 U	<0.000792 U	<0.000785 U	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-24	LSB-24	LSB-24	LSB-24	LSB-25	LSB-25	LSB-25	LSB-26	LSB-26	LSB-26	LSB-27	LSB-27	LSB-27	LSB-27	LSB-27
					Sample Name	082_LSB-24A	083_LSB-24B	084_LSB-24C	LSB24A_16-18	074_LSB-25A	075_LSB-25B	076_LSB-25C	072_LSB-26A	073_LSB-26B	081_LSB-26C	085_LSB-27A	086_DUP-4	087_LSB-27B	088_LSB-27C	LSB27A_17-19
					Sample Date	04/15/2021	04/15/2021	04/15/2021	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/14/2021	04/15/2021	04/15/2021	04/15/2021	04/15/2021	04/19/2023
					Sample Depth	0-2	3-5	13-15	16-18	0-2	12-14	17-19	0-2	10-12	20.5-22.5	0-2	0-2	7-9	13-15	17-19
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatile Organic Compounds																				
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
1,1,1-Trichloroethane	71-55-6	0.68	0.68	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	NS	NS	NS	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	NA	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	NA
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
1,1-Dichloroethane	75-34-3	0.27	0.27	26	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
1,1-Dichloroethene	75-35-4	0.33	0.33	100	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0022 U	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.00096 U
1,1-Dichloropropene	563-58-6	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,2,3-Trichloropropane	96-18-4	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	mg/kg	NA	NA	NA	<0.0045 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0019 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,2,4-Trimethylbenzene	95-63-6	3.6	3.6	52	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,2-Dibromo-3-Chloropropane	96-12-8	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0067 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0029 U
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
1,2-Dichlorobenzene	95-50-1	1.1	1.1	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,2-Dichloroethane	107-06-2	0.02	0.02	3.1	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
1,2-Dichloropropane	78-87-5	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	8.4	52	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,3-Dichlorobenzene	541-73-1	2.4	2.4	49	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,3-Dichloropropane	142-28-9	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,4-Dichlorobenzene	106-46-7	1.8	1.8	13	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
1,4-Diethyl Benzene	105-05-5	NS	NS	NS	mg/kg	NA	NA	NA	<0.0045 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0019 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	0.1	13	mg/kg	<0.04 U	<0.039 U	<0.047 U	<0.18 U	<0.041 U	<0.044 U	<0.066 U	<0.05 UJ	<0.042 U	<0.049 U	<0.041 U	<0.04 U	<0.048 U	<0.042 U	<0.077 U
2,2-Dichloropropane	594-20-7	NS	NS	NS	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0045 U	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.0019 U
2-Chlorotoluene	95-49-8	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
2-Hexanone (MBK)	591-78-6	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0096 U
4-Chlorotoluene	106-43-4	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
4-Ethyltoluene	622-96-8	NS	NS	NS	mg/kg	NA	NA	NA	<0.0045 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0019 U
Acetone	67-64-1	**0.05**	0.05	100	mg/kg	0.0064 J	0.011 J	**0.093 J**	**0.28**	0.038 J	0.036 J	**0.11 J**	**0.076 J**	0.025 J	0.018 J	0.031 J	0.032 J	<0.0048 UJ	0.022 J	0.019
Acrolein	107-02-8	NS	NS	NS	mg/kg	<0.004 UJ	<0.0039 UJ	<0.0047 UJ	NA	<0.0041 UJ	<0.0044 UJ	<0.0066 UJ	<0.005 UJ	<0.0042 UJ	<0.0049 UJ	<0.0041 UJ	<0.004 UJ	<0.0048 UJ	<0.0042 UJ	NA
Acrylonitrile	107-13-1	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0089 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0039 U
Benzene	71-43-2	0.06	0.06	4.8	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
Bromobenzene	108-86-1	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
Bromochloromethane	74-97-5	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
Bromodichloromethane	75-27-4	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
Bromoform	75-25-2	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0089 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0039 U
Bromomethane	74-83-9	NS	NS	NS	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.0019 U
Carbon Disulfide	75-15-0	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.022 U	0.0021 J	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0096 U
Carbon Tetrachloride	56-23-5	0.76	0.76	2.4	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
Chlorobenzene	108-90-7	1.1	1.1	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
Chloroethane	75-00-3	NS	NS	NS	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0045 U	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.0019 U
Chloroform	67-66-3	0.37	0.37	49	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0034 U	<0.0041 U	<0.0044 U	<0.0066 U	<0.0025 U	<0.0042 U	<0.0049 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0014 U
Chloromethane	74-87-3	NS	NS	NS	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0089 U	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.0039 U
Cis-1,2-Dichloroethene	156-59-2	0.25	0.25	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
Cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
Cyclohexane	110-82-7	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	NA	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	NA
Cymene	99-87-6	NS	NS	NS	mg/kg	NA	NA	NA	<0.0022 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.00096 U
Dibromochloromethane	124-48-1	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
Dibromomethane	74-95-3	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
Dichlorodifluoromethane	75-71-8	NS	NS	NS	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.0096 U
Diethyl Ether (Ethyl Ether)	60-29-7	NS	NS	NS	mg/kg	NA	NA	NA	<0.0045 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0019 U
Ethylbenzene	100-41-4	1	1	41	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
Hexachlorobutadiene	87-68-3	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0089 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0039 U
Isopropylbenzene (Cumene)	98-82-8	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
M,P-Xylene	179601-23-1	NS	NS	NS	mg/kg	<0.004 U	<0.0039 U	<0.0047 U	<0.0045 U	<0.0041 U	<0.0044 U	<0.0066 U	<0.005 U	<0.0042 U	<0.0049 U	<0.0041 U	<0.004 U	<0.0048 U	<0.0042 U	<0.0019 U
Methyl Acetate	79-20-9	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	NA	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	NA
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	0.12	100	mg/kg	<0.002 U	0.0022 J	0.03	0.074	0.0056 J	0.0065 J	0.033 J	0.017 J	0.0037 J	0.0026 J	0.0075	0.0079	<0.0024 U	0.0047	<0.0096 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	108-10-1	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0096 U
Methylcyclohexane	108-87-2	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	NA	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	NA
Methylene Chloride	75-09-2	0.05	0.05	100	mg/kg	<0.0081 U	<0.0079 U	<0.0047 U	<0.011 U	<0.0041 U	<0.0044 U	<0.0066 U	0.006 J	<0.0042 U	<0.0049 U	<0.0041 U	<0.004 U	<0.0097 U	<0.0042 U	<0.0048 U
Naphthalene	91-20-3	12	12	100	mg/kg	NA	NA	NA	<0.0089 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0039 U
n-Butylbenzene	104-51-8	12	12	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
n-Propylbenzene	103-65-1	3.9	3.9	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
o-Xylene (1,2-Dimethylbenzene)	95-47-6	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
p-Cymene (p-Isopropyltoluene)	CYMP	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	NA	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	NA
Sec-Butylbenzene	135-98-8	11	11	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
Styrene	100-42-5	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
T-Butylbenzene	98-06-6	5.9	5.9	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
Tert-Butyl Alcohol	75-65-0	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	NA	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	NA
Tert-Butyl Methyl Ether	1634-04-4	0.93	0.93	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0045 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0019 U
Tetrachloroethene (PCE)	127-18-4	1.3	1.3	19	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0011 U	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.00048 U
Toluene	108-88-3	0.7	0.7	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
Total 1,2-Dichloroethene (Cis and Trans)	540-59-0	NS	NS	NS	mg/kg	NA	NA	NA	<0.0022 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.00096 U
Total Xylenes	1330-20-7	0.26	1.6	100	mg/kg	<0.006 U	<0.0059 U	<0.007 U	<0.0022 U	<0.0061 U	<0.0065 U	<0.0098 U	<0.0075 U	<0.0062 U	<0.0074 U	<0.0061 U	<0.0059 U	<0.0073 U	<0.0063 U	<0.00096 U
Total, 1,3-Dichloropropene (Cis And Trans)	542-75-6	NS	NS	NS	mg/kg	NA	NA	NA	<0.0011 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.00048 U
Trans-1,2-Dichloroethene	156-60-5	0.19	0.19	100	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0034 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.0014 U
Trans-1,3-Dichloropropene	10061-02-6	NS	NS	NS	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0022 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00096 U
Trans-1,4-Dichloro-2-Butene	110-57-6	NS	NS	NS	mg/kg	NA	NA	NA	<0.011 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0048 U
Trichloroethene (TCE)	79-01-6	0.47	0.47	21	mg/kg	<0.002 U	<0.002 U	<0.0023 U	<0.0011 U	<0.002 U	<0.0022 U	<0.0033 U	<0.0025 U	<0.0021 U	<0.0025 U	<0.002 U	<0.002 U	<0.0024 U	<0.0021 U	<0.00048 U
Trichlorofluoromethane	75-69-4	NS	NS	NS	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0089 U	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.0039 U
Vinyl Acetate	108-05-4	NS	NS	NS	mg/kg	NA	NA	NA	<0.022 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0096 U
Vinyl Chloride	75-01-4	0.02	0.02	0.9	mg/kg	<0.002 UJ	<0.002 UJ	<0.0023 UJ	<0.0022 U	<0.002 UJ	<0.0022 UJ	<0.0033 UJ	<0.0025 U	<0.0021 UJ	<0.0025 UJ	<0.002 UJ	<0.002 UJ	<0.0024 UJ	<0.0021 UJ	<0.00096 U

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-24	LSB-24	LSB-24	LSB-24	LSB-25	LSB-25	LSB-25	LSB-26	LSB-26	LSB-26	LSB-27	LSB-27	LSB-27	LSB-27	LSB-27
					Sample Name	082_LSB-24A	083_LSB-24B	084_LSB-24C	LSB24A_16-18	074_LSB-25A	075_LSB-25B	076_LSB-25C	072_LSB-26A	073_LSB-26B	081_LSB-26C	085_LSB-27A	086_DUP-4	087_LSB-27B	088_LSB-27C	LSB27A_17-19
					Sample Date	04/15/2021	04/15/2021	04/15/2021	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/14/2021	04/15/2021	04/15/2021	04/15/2021	04/15/2021	04/19/2023
					Sample Depth	0-2	3-5	13-15	16-18	0-2	12-14	17-19	0-2	10-12	20.5-22.5	0-2	0-2	7-9	13-15	17-19
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Semi-Volatile Organic Compounds																				
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	NS	mg/kg	<0.093 U	<0.0877 U	<0.0991 U	<0.32 U	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 U	<0.0905 U	<0.0884 U	<0.107 U	<0.0919 U	<0.2 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
1,2-Dichlorobenzene	95-50-1	1.1	1.1	100	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
1,2-Diphenylhydrazine	122-66-7	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	NA	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	NA
1,3-Dichlorobenzene	541-73-1	2.4	2.4	49	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
1,4-Dichlorobenzene	106-46-7	1.8	1.8	13	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	0.1	13	mg/kg	<0.0098 UJ	<0.0098 U	<0.0098 U	<0.048 U	<0.00935 U	<0.00935 U	<0.00943 U	<0.0098 U	<0.00926 U	<0.00943 U	<0.0098 U	<0.0098 U	<0.0098 U	<0.0098 U	<0.03 U
2,3,4,6-Tetrachlorophenol	58-90-2	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	NA	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 UJ	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	NA
2,4,5-Trichlorophenol	95-95-4	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.19 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 UJ	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.12 U
2,4-Dichlorophenol	120-83-2	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.29 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.18 U
2,4-Dimethylphenol	105-67-9	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
2,4-Dinitrophenol	51-28-5	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	<1.5 U	<0.0914 UJ	<0.0901 UJ	<0.101 UJ	<0.095 UJ	<0.0964 UJ	<0.0988 UJ	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	<0.96 U
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	mg/kg	<0.0466 UJ	<0.044 UJ	<0.0497 UJ	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 UJ	<0.0453 UJ	<0.0443 UJ	<0.0535 UJ	<0.046 UJ	<0.2 U
2,6-Dinitrotoluene	606-20-2	NS	NS	NS	mg/kg	<0.0466 UJ	<0.044 UJ	<0.0497 UJ	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 UJ	<0.0453 UJ	<0.0443 UJ	<0.0535 UJ	<0.046 UJ	<0.2 U
2-Chloronaphthalene	91-58-7	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
2-Chlorophenol	95-57-8	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
2-Methylnaphthalene	91-57-6	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	0.112 D	<0.39 U	0.115 D	<0.0451 U	<0.0504 U	<0.0476 U	0.0655 JD	0.06 JD	0.0542 JD	<0.0443 U	<0.0535 U	<0.046 U	<0.24 U
2-Methylphenol (o-Cresol)	95-48-7	0.33	0.33	100	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
2-Nitroaniline	88-74-4	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	<0.32 U	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 UJ	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	<0.2 U
2-Nitrophenol	88-75-5	NS	NS	NS	mg/kg	<0.0466 UJ	<0.044 UJ	<0.0497 UJ	<0.7 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 UJ	<0.0453 UJ	<0.0443 UJ	<0.0535 UJ	<0.046 UJ	<0.43 U
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	0.33	0.33	100	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.46 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.29 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	NS	mg/kg	<0.0466 UJ	<0.044 UJ	<0.0497 UJ	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 UJ	<0.0453 UJ	<0.0443 UJ	<0.0535 UJ	<0.046 UJ	<0.2 U
3-Nitroaniline	99-09-2	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	<0.32 U	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 UJ	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	<0.2 U
4,6-Dinitro-2-Methylphenol	534-52-1	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	<0.84 U	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 UJ	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	<0.52 U
4-Bromophenyl Phenyl Ether	101-55-3	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
4-Chloro-3-Methylphenol	59-50-7	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
4-Chloroaniline	106-47-8	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 UJ	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 UJ
4-Chlorophenyl Phenyl Ether	7005-72-3	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
4-Nitroaniline	100-01-6	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	<0.32 U	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 UJ	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	<0.2 U
4-Nitrophenol	100-02-7	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	<0.45 U	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 U	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	<0.28 U
Acenaphthene	83-32-9	20	98	100	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.26 U	0.18 D	0.0727 JD	<0.0504 U	<0.0476 U	0.189 D	0.0884 JD	<0.0453 U	0.0735 JD	<0.0535 U	<0.046 U	<0.16 U
Acenaphthylene	208-96-8	100	107	100	mg/kg	0.0751 JD	<0.044 U	<0.0497 U	<0.26 U	0.0782 JD	0.0533 JD	<0.0504 U	0.0547 JD	0.0801 JD	<0.0495 U	0.0593 JD	0.0799 JD	<0.0535 U	<0.046 U	<0.16 U
Acetophenone	98-86-2	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
Aniline (Phenylamine, Aminobenzene)	62-53-3	NS	NS	NS	mg/kg	<0.186 U	<0.176 U	<0.198 U	NA	<0.183 U	<0.18 U	<0.201 U	<0.19 U	<0.193 U	<0.198 U	<0.181 U	<0.177 U	<0.214 U	<0.184 U	NA
Anthracene	120-12-7	100	1000	100	mg/kg	0.133 D	0.0659 JD	0.15 D	<0.19 U	0.277 D	0.281 D	<0.0504 U	0.143 D	0.534 D	0.214 D	0.124 D	0.17 D	0.0982 JD	0.0558 JD	<0.12 U
Atrazine	1912-24-9	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	NA	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	NA
Benzaldehyde	100-52-7	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	0.174 D	NA	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	0.687 D	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	NA
Benzidine	92-87-5	NS	NS	NS	mg/kg	<0.186 U	<0.176 U	<0.198 U	NA	<0.183 UJ	<0.18 UJ	<0.201 UJ	<0.19 UJ	<0.193 UJ	<0.198 U	<0.181 U	<0.177 U	<0.214 U	<0.184 U	NA
Benzo(a)anthracene	56-55-3	**1**	1	1	mg/kg	0.408 D	0.182 D	0.435 D	<0.19 U	0.573 D	0.775 D	<0.0504 U	0.445 D	**1.03 D**	0.489 D	0.438 D	0.546 D	0.454 D	0.171 D	<0.12 U
Benzo(a)pyrene	50-32-8	**1**	22	1	mg/kg	0.441 D	0.215 D	0.402 D	<0.26 U	0.589 D	0.675 D	<0.0504 U	0.518 D	**1.05 D**	0.415 D	0.565 D	0.667 D	0.665 D	0.184 D	<0.16 U
Benzo(b)fluoranthene	205-99-2	**1**	1.7	1	mg/kg	0.328 D	0.171 D	0.348 D	<0.19 U	0.5 D	0.56 D	<0.0504 U	0.427 D	0.882 D	0.311 D	0.429 D	0.542 D	0.53 D	0.142 D	<0.12 U
Benzo(g,h,i)Perylene	191-24-2	100	1000	100	mg/kg	0.282 D	0.137 D	0.228 D	<0.26 U	0.417 D	0.365 D	<0.0504 U	0.267 D	0.35 D	0.246 D	0.311 D	0.375 D	0.334 D	0.103 D	<0.16 U
Benzo(k)fluoranthene	207-08-9	**0.8**	1.7	3.9	mg/kg	0.343 D	0.171 D	0.27 D	<0.19 U	0.456 D	0.523 D	<0.0504 U	0.384 D	0.781 D	0.352 D	0.387 D	0.521 D	0.48 D	0.145 D	<0.12 U
Benzoic Acid	65-85-0	NS	NS	NS	mg/kg	<0.0466 UJ	<0.044 UJ	<0.0497 UJ	<1 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 UJ	<0.0443 UJ	<0.0535 UJ	<0.046 UJ	<0.64 U
Benzyl Alcohol	100-51-6	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
Benzyl Butyl Phthalate	85-68-7	NS	NS	NS	mg/kg	<0.0466 UJ	<0.044 UJ	<0.0497 UJ	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	0.0678 JD	<0.0495 UJ	<0.0453 UJ	<0.0443 UJ	<0.0535 UJ	1.44 J	<0.2 U
Biphenyl (Diphenyl)	92-52-4	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.73 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.45 U
Bis(2-chloroethoxy) methane	111-91-1	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.35 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.22 U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	111-44-4	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.29 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.18 U
Bis(2-chloroisopropyl) ether	108-60-1	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.39 U	<0.0458 UJ	<0.0451 UJ	<0.0504 UJ	<0.0476 UJ	<0.0483 UJ	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.24 U
Bis(2-ethylhexyl) phthalate	117-81-7	NS	NS	NS	mg/kg	0.0832 J	0.0856 J	0.285 J	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	1.42 D	<0.0453 UJ	0.0594 J	<0.0535 UJ	0.173 J	<0.2 U
Caprolactam	105-60-2	NS	NS	NS	mg/kg	<0.093 UJ	<0.0877 UJ	<0.0991 UJ	NA	<0.0914 U	<0.0901 U	<0.101 U	<0.095 U	<0.0964 U	<0.0988 U	<0.0905 UJ	<0.0884 UJ	<0.107 UJ	<0.0919 UJ	NA
Carbazole	86-74-8	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	0.0504 JD	0.0583 JD	<0.0504 U	<0.0476 U	0.125 D	0.0497 JD	<0.0453 U	0.0481 JD	<0.0535 U	<0.046 U	<0.2 U
Chrysene	218-01-9	**1**	1	3.9	mg/kg	0.389 D	0.18 D	0.668 D	<0.19 U	0.594 D	0.794 D	<0.0504 U	0.423 D	0.998 D	0.483 D	0.424 D	0.543 D	0.444 D	0.162 D	<0.12 U
Dibenz(a,h)anthracene	53-70-3	**0.33**	1000	0.33	mg/kg	0.0602 JD	<0.044 U	0.102 D	<0.19 U	0.156 D	0.152 D	<0.0504 U	0.0995 D	0.123 D	0.0813 JD	0.103 D	0.125 D	0.114 D	<0.046 U	<0.12 U
Dibenzofuran	132-64-9	7	210	59	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	0.0534 JD	<0.0451 U	<0.0504 U	<0.0476 U	0.0871 JD	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
Dibutyl phthalate	84-74-2	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	0.135 D	<0.2 U
Diethyl phthalate	84-66-2	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
Dimethyl phthalate	131-11-3	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
Dioctyl phthalate	117-84-0	NS	NS	NS	mg/kg	<0.0466 UJ	<0.044 UJ	<0.0497 UJ	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 UJ	0.047 J	<0.0443 UJ	<0.0535 UJ	<0.046 UJ	<0.2 U
Fluoranthene	206-44-0	100	1000	100	mg/kg	0.719 D	0.325 D	0.653 D	<0.19 U	1.02 D	1.23 D	<0.0504 U	0.973 D	2.55 D	0.903 D	0.748 D	0.945 D	0.762 D	0.278 D	<0.12 U
Fluorene	86-73-7	30	386	100	mg/kg	<0.0466 U	<0.044 U	0.0657 JD	<0.32 U	0.229 D	0.0972 D	<0.0504 U	0.0539 JD	0.227 D	0.111 D	<0.0453 U	0.0806 JD	<0.0535 U	<0.046 U	<0.2 U
Hexachlorobenzene	118-74-1	0.33	3.2	1.2	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.19 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.12 U
Hexachlorobutadiene	87-68-3	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.92 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 UJ	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.57 U
Hexachloroethane	67-72-1	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.26 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.16 U
Indeno(1,2,3-cd)pyrene	193-39-5	**0.5**	8.2	0.5	mg/kg	0.282 D	0.142 D	0.233 D	<0.26 U	0.464 D	0.415 D	<0.0504 U	0.289 D	0.403 D	0.227 D	0.317 D	0.385 D	0.342 D	0.105 D	<0.16 U
Isophorone	78-59-1	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.29 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.18 U
Naphthalene	91-20-3	12	12	100	mg/kg	<0.0466 U	<0.044 U	0.0958 JD	<0.32 U	0.177 D	0.0583 JD	<0.0504 U	0.0889 JD	0.166 D	0.102 D	0.122 D	0.0672 JD	<0.0535 U	<0.046 U	<0.2 U
Nitrobenzene	98-95-3	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.29 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.18 U
n-Nitrosodimethylamine	62-75-9	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	NA	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	NA
n-Nitrosodi-N-Propylamine	621-64-7	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
n-Nitrosodiphenylamine	86-30-6	NS	NS	NS	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.26 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.16 U
Pentachlorophenol	87-86-5	0.8	0.8	6.7	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.26 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.16 U
Phenanthrene	85-01-8	100	1000	100	mg/kg	0.406 D	0.214 D	0.746 D	<0.19 U	0.925 D	1.1 D	<0.0504 U	0.406 D	1.6 D	0.706 D	0.422 D	0.566 D	0.334 D	0.193 D	<0.12 U
Phenol	108-95-2	0.33	0.33	100	mg/kg	<0.0466 U	<0.044 U	<0.0497 U	<0.32 U	<0.0458 U	<0.0451 U	<0.0504 U	<0.0476 U	<0.0483 U	<0.0495 U	<0.0453 U	<0.0443 U	<0.0535 U	<0.046 U	<0.2 U
Pyrene	129-00-0	100	1000	100	mg/kg	0.734 D	0.297 D	0.671 D	<0.19 U	1.19 D	1.28 D	<0.0504 U	0.71 D	1.76 D	1.02 D	0.7 D	0.87 D	0.68 D	0.269 D	<0.12 U
Pyridine	110-86-1	NS	NS	NS	mg/kg	<0.186 U	<0.176 U	<0.198 U	NA	<0.183 U	<0.18 U	<0.201 U	<0.19 U	<0.193 U	<0.198 U	<0.181 U	<0.177 U	<0.214 U	<0.184 U	NA

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-24	LSB-24	LSB-24	LSB-24	LSB-25	LSB-25	LSB-25	LSB-26	LSB-26	LSB-26	LSB-27	LSB-27	LSB-27	LSB-27	LSB-27
					Sample Name	082_LSB-24A	083_LSB-24B	084_LSB-24C	LSB24A_16-18	074_LSB-25A	075_LSB-25B	076_LSB-25C	072_LSB-26A	073_LSB-26B	081_LSB-26C	085_LSB-27A	086_DUP-4	087_LSB-27B	088_LSB-27C	LSB27A_17-19
					Sample Date	04/15/2021	04/15/2021	04/15/2021	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/14/2021	04/15/2021	04/15/2021	04/15/2021	04/15/2021	04/19/2023
					Sample Depth	0-2	3-5	13-15	16-18	0-2	12-14	17-19	0-2	10-12	20.5-22.5	0-2	0-2	7-9	13-15	17-19
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Pesticides																				
4,4'-DDD	72-54-8	**0.0033**	14	13	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	**0.00622 D**	<0.00179 U	<0.00198 U	**0.0148 D**	**0.0118 D**	**0.00977 D**	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
4,4'-DDE	72-55-9	**0.0033**	17	8.9	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
4,4'-DDT	50-29-3	**0.0033**	136	7.9	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
Aldrin	309-00-2	0.005	0.19	0.097	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
Alpha BHC (Alpha Hexachlorocyclohexane)	319-84-6	0.02	0.02	0.48	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00123 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.000765 U
Alpha Chlordane	5103-71-9	0.094	2.9	4.2	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00368 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.0023 U
Alpha Endosulfan	959-98-8	2.4	102	24	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.09	0.36	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
Beta Endosulfan	33213-65-9	2.4	102	24	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
Chlordane (alpha and gamma)	57-74-9	NS	NS	NS	mg/kg	NA	NA	NA	<0.0245 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0153 U
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	0.25	100	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
Dieldrin	60-57-1	**0.005**	0.1	0.2	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00184 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00115 U
Endosulfan Sulfate	1031-07-8	2.4	1000	24	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00123 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.000765 U
Endrin	72-20-8	0.014	0.06	11	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00123 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.000765 U
Endrin Aldehyde	7421-93-4	NS	NS	NS	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00368 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.0023 U
Endrin Ketone	53494-70-5	NS	NS	NS	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00294 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00184 U
Gamma Bhc (Lindane)	58-89-9	0.1	0.1	1.3	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00123 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.000765 U
Gamma Chlordane (Trans)	5103-74-2	NS	NS	NS	mg/kg	NA	NA	NA	<0.00368 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0023 U
Gamma-Chlordane	5566-34-7	NS	NS	NS	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	NA	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	NA
Heptachlor	76-44-8	0.042	0.38	2.1	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00147 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.000918 U
Heptachlor Epoxide	1024-57-3	NS	NS	NS	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00552 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00344 U
Methoxychlor	72-43-5	NS	NS	NS	mg/kg	<0.00184 UJ	<0.00173 U	<0.00197 UJ	<0.00552 U	<0.00185 U	<0.00179 U	<0.00198 U	<0.00189 U	<0.00189 U	<0.00197 U	<0.00179 U	<0.00177 U	<0.00211 U	<0.00184 U	<0.00344 U
Toxaphene	8001-35-2	NS	NS	NS	mg/kg	<0.184 UJ	<0.173 U	<0.197 UJ	<0.0552 U	<0.185 U	<0.179 U	<0.198 U	<0.189 U	<0.189 U	<0.197 U	<0.179 U	<0.177 U	<0.211 U	<0.184 U	<0.0344 U
Herbicides																				
2,4,5-T (Trichlorophenoxyacetic Acid)	93-76-5	NS	NS	NS	mg/kg	<0.022 U	<0.021 U	<0.0238 U	<0.315 U	<0.0223 U	<0.022 U	<0.0238 U	<0.0231 U	<0.0226 U	<0.0237 U	<0.0218 U	<0.0213 U	<0.0259 U	<0.0222 U	<0.2 U
2,4-D (Dichlorophenoxyacetic Acid)	94-75-7	NS	NS	NS	mg/kg	<0.022 U	<0.021 U	<0.0238 U	<0.315 U	<0.0223 U	<0.022 U	<0.0238 U	<0.0231 U	<0.0226 U	<0.0237 U	<0.0218 U	<0.0213 U	<0.0259 U	<0.0222 U	<0.2 U
Silvex (2,4,5-Tp)	93-72-1	3.8	3.8	100	mg/kg	<0.022 U	<0.021 U	<0.0238 U	<0.315 U	<0.0223 U	<0.022 U	<0.0238 U	<0.0231 U	<0.0226 U	<0.0237 U	<0.0218 U	<0.0213 U	<0.0259 U	<0.0222 U	<0.2 U
Polychlorinated Biphenyl																				
PCB-1016 (Aroclor 1016)	12674-11-2	NS	NS	NS	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	<0.0186 U	<0.018 U	<0.02 U	<0.0191 U	<0.0191 U	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	<0.0185 U	<0.0551 U
PCB-1221 (Aroclor 1221)	11104-28-2	NS	NS	NS	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	<0.0186 U	<0.018 U	<0.02 U	<0.0191 U	<0.0191 U	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	<0.0185 U	<0.0551 U
PCB-1232 (Aroclor 1232)	11141-16-5	NS	NS	NS	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	<0.0186 U	<0.018 U	<0.02 U	<0.0191 U	<0.0191 U	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	<0.0185 U	<0.0551 U
PCB-1242 (Aroclor 1242)	53469-21-9	NS	NS	NS	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	<0.0186 U	<0.018 U	<0.02 U	<0.0191 U	<0.0191 U	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	<0.0185 U	<0.0551 U
PCB-1248 (Aroclor 1248)	12672-29-6	NS	NS	NS	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	<0.0186 U	<0.018 U	<0.02 U	<0.0191 U	<0.0191 U	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	<0.0185 U	<0.0551 U
PCB-1254 (Aroclor 1254)	11097-69-1	NS	NS	NS	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	<0.0186 U	<0.018 U	<0.02 U	<0.0191 U	0.247	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	<0.0185 U	<0.0551 U
PCB-1260 (Aroclor 1260)	11096-82-5	NS	NS	NS	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	0.0622	<0.018 U	<0.02 U	0.0291 J	<0.0191 U	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	0.0509	<0.0551 U
PCB-1262 (Aroclor 1262)	37324-23-5	NS	NS	NS	mg/kg	NA	NA	NA	<0.0916 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0551 U
PCB-1268 (Aroclor 1268)	11100-14-4	NS	NS	NS	mg/kg	NA	NA	NA	<0.0916 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0551 U
Total PCBs	1336-36-3	**0.1**	3.2	1	mg/kg	<0.0186 UJ	<0.0175 UJ	<0.0199 UJ	<0.0916 U	0.0622	<0.018 U	<0.02 U	0.0291 J	**0.247**	<0.0199 U	<0.0181 U	<0.0178 U	<0.0213 U	0.0509	<0.0551 U
Metals																				
Aluminum	7429-90-5	NS	NS	NS	mg/kg	6,670	3,770	9,720	14,800	7,960	5,400	3,830	8,090	6,820	6,040	7,100	6,870	3,810	6,320	3,640
Antimony	7440-36-0	NS	NS	NS	mg/kg	<2.82 UJ	<2.67 UJ	<3.01 UJ	0.929 J	8.14 J	6.18 J	<3.04 U	<2.91 U	<2.9 U	<3.02 U	<2.75 UJ	<2.69 UJ	<3.24 UJ	<2.79 U	0.361 J
Arsenic	7440-38-2	**13**	16	16	mg/kg	11.1 J	2.33	3.18	2.72	**15.7**	4.05	5.02	5.04	4.4	3.38	6.69	6.7	4.27	8.25	1.08
Barium	7440-39-3	**350**	820	400	mg/kg	**438 J**	92.5	120	9.67	**563**	**545**	265	**411**	279	115	**491**	**465**	170	218	19.8
Beryllium	7440-41-7	7.2	47	72	mg/kg	<0.056 U	<0.053 U	<0.06 U	0.573 J	<0.056 U	<0.056 U	<0.061 U	<0.058 U	<0.058 U	<0.06 U	<0.055 U	<0.054 U	<0.065 U	<0.056 U	0.351 J
Cadmium	7440-43-9	**2.5**	7.5	4.3	mg/kg	0.943	<0.32 U	<0.361 U	<1.46 U	2.28	2.08	0.376	0.874	0.963	0.364	1.37	1.27	0.689	1.4	<0.92 U
Calcium	7440-70-2	NS	NS	NS	mg/kg	8,870 B	24,800 B	1,780 B	782	16,000	11,100	3,180	7,320	17,400	20,000 B	14,200 B	10,200 B	88,300 B	13,100 B	455
Chromium, Hexavalent	18540-29-9	1	19	110	mg/kg	<0.565 UJ	<0.533 U	<0.602 U	<1.55 U	<0.563 U	<0.556 U	<0.609 U	<0.581 U	<0.58 U	<0.604 UJ	<0.55 U	<0.537 U	<0.649 U	<0.558 U	<0.963 U
Chromium, Total	7440-47-3	NS	NS	NS	mg/kg	30.8 J	12	16.1	17.2	50.7	236	17.5	23.3	43.6	26.9	28.4	29.7	13.3	33.7	6.73
Chromium, Trivalent	16065-83-1	**30**	NS	180	mg/kg	NA	NA	NA	17.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.73
Cobalt	7440-48-4	NS	NS	NS	mg/kg	8.58 J	3.36	3.23	2.97	11.6	7.54	4.87	6.81	6.1	5.26	7.08	6.25	4.14	8.72	2.72
Copper	7440-50-8	**50**	1720	270	mg/kg	**146 J**	48.4	20.1	5.18	**687**	**447**	**133**	**71.8**	**71.4**	**63.5**	**143**	**173**	**263**	**83**	7.6
Cyanide	57-12-5	27	40	27	mg/kg	<0.0113 UJ	<0.0107 U	<0.012 U	<1.9 U	<0.563 U	<0.556 U	<0.609 U	<0.581 U	<0.58 U	<0.604 U	<0.011 U	<0.0107 U	<0.013 U	<0.0112 U	<1.2 U
Iron	7439-89-6	NS	NS	NS	mg/kg	40,200 J	8,650	10,500	8,450	67,500	28,900	9,010	18,800	19,700	13,600	24,900	18,700	19,500	27,300	6,130
Lead	7439-92-1	**63**	450	400	mg/kg	**1,690 J**	**102**	**71.1**	16.3	**3,820**	**823**	**142**	**433**	**367**	**134**	**544**	**483**	**214**	**461**	4.02 J
Magnesium	7439-95-4	NS	NS	NS	mg/kg	2,560 J	12,800	1,720	1,750	3,390	4,100	460	2,250	5,620	4,970	4,130	3,230	49,300	4,140	1,520
Manganese	7439-96-5	1600	2000	2000	mg/kg	291 J	91.9	94.8	40.4	480	236	74.5	138	203	237	234	200	201	268	37.7
Mercury	7439-97-6	**0.18**	0.73	0.81	mg/kg	**0.463**	0.0757	0.0721	<0.136 U	**0.256**	**0.64**	0.109	**0.314**	**0.341**	0.142	**0.644**	**0.616**	**0.467**	**0.222**	<0.076 U
Nickel	7440-02-0	**30**	130	310	mg/kg	27.6 J	14.4	14.4	12.9	**43**	**43.8**	17.7	20.9	22	17.7	24.3	22.7	12.8	**38.6**	11.6
Potassium	7440-09-7	NS	NS	NS	mg/kg	742 B	609 B	706 B	741	1,210 B	626 B	418 B	613 B	801 B	727 B	1,060 B	708 B	647 B	768 B	331
Selenium	7782-49-2	**3.9**	4	180	mg/kg	<2.82 UJ	**5.48 J**	<3.01 U	0.745 J	<2.81 U	<2.78 U	<3.04 U	<2.91 U	<2.9 U	<3.02 U	<2.75 U	<2.69 U	**5.24 J**	<2.79 U	0.33 J
Silver	7440-22-4	**2**	8.3	180	mg/kg	<0.565 UJ	<0.533 U	<0.602 U	<0.73 U	0.692	**7.96**	<0.609 U	<0.581 U	<0.58 U	<0.604 U	<0.55 U	1.2	<0.649 U	<0.558 U	<0.46 U
Sodium	7440-23-5	NS	NS	NS	mg/kg	283 J	136	148 J	<292 U	1,380	166	382	461	313	193	471	611	213	196	<184 U
Thallium	7440-28-0	NS	NS	NS	mg/kg	<2.82 U	<2.67 U	<3.01 U	<2.92 U	<2.81 U	<2.78 U	<3.04 U	<2.91 U	<2.9 U	<3.02 U	<2.75 U	<2.69 U	<3.24 U	<2.79 U	<1.84 U
Vanadium	7440-62-2	NS	NS	NS	mg/kg	25.2 J	44	19.3	17.3	26.7	30	15.9	23.6	25	19.6	34.7	25	22.6	21.6	10.4
Zinc	7440-66-6	**109**	2480	10000	mg/kg	**532 J**	**121**	**116**	30.4	**632**	**839**	**169**	**295**	**267**	**116**	**448**	**470**	**732**	**711**	12.1
General Chemistry																				
Total Solids	TSOLID	NS	NS	NS	Percent	88.5	93.8	83.1	51.5	88.8	89.9	82.2	86	86.2	82.8	91	93.1	77.1	89.6	83.1

Table 1
Remedial Action Work Plan
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Analyte	CAS Number	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	Location	LSB-24	LSB-24	LSB-24	LSB-24	LSB-25	LSB-25	LSB-25	LSB-26	LSB-26	LSB-26	LSB-27	LSB-27	LSB-27	LSB-27	LSB-27
					Sample Name	082_LSB-24A	083_LSB-24B	084_LSB-24C	LSB24A_16-18	074_LSB-25A	075_LSB-25B	076_LSB-25C	072_LSB-26A	073_LSB-26B	081_LSB-26C	085_LSB-27A	086_DUP-4	087_LSB-27B	088_LSB-27C	LSB27A_17-19
					Sample Date	04/15/2021	04/15/2021	04/15/2021	04/19/2023	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/13/2021	04/14/2021	04/15/2021	04/15/2021	04/15/2021	04/15/2021	04/19/2023
					Sample Depth	0-2	3-5	13-15	16-18	0-2	12-14	17-19	0-2	10-12	20.5-22.5	0-2	0-2	7-9	13-15	17-19
					Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Perfluorooctanoic acids																				
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	763051-92-9	NS	NS	NS	mg/kg	NA	NA	NA	<0.000798 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000797 U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	6HPFHXSA	NS	NS	NS	mg/kg	NA	NA	NA	<0.000798 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000797 U
3:3 FTCA	356-02-5	NS	NS	NS	mg/kg	NA	NA	NA	<0.000998 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000996 U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	NS	NS	NS	mg/kg	NA	NA	NA	<0.000798 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000797 U
5:3 FTCA	914637-49-3	NS	NS	NS	mg/kg	NA	NA	NA	<0.00499 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.00498 U
7:3 FTCA	812-70-4	NS	NS	NS	mg/kg	NA	NA	NA	<0.00499 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.00498 U
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid	756426-58-1	NS	NS	NS	mg/kg	NA	NA	NA	<0.000798 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000797 U
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
N-ethylperfluorooctane sulfonamide	4151-50-2	NS	NS	NS	mg/kg	NA	NA	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000199 U
N-ethylperfluorooctane sulfonamidoe	1691-99-2	NS	NS	NS	mg/kg	NA	NA	NA	<0.002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.00199 U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
N-methylperfluorooctane sulfonamide	31506-32-8	NS	NS	NS	mg/kg	NA	NA	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000199 U
N-methylperfluorooctanesulfonamidol	24448-09-7	NS	NS	NS	mg/kg	NA	NA	NA	<0.002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.00199 U
Nonafluoro-3,6-dioxaheptanoic acid	151772-58-6	NS	NS	NS	mg/kg	NA	NA	NA	<0.000399 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000398 U
Perfluoro(2-ethoxyethane)sulfonic acid	113507-82-7	NS	NS	NS	mg/kg	NA	NA	NA	<0.000399 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000398 U
Perfluoro-3-methoxypropanoic acid	377-73-1	NS	NS	NS	mg/kg	NA	NA	NA	<0.000399 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000398 U
Perfluoro-4-methoxybutanoic acid	863090-89-5	NS	NS	NS	mg/kg	NA	NA	NA	<0.000399 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000398 U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorobutanoic acid (PFBA)	375-22-4	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.000798 U	<0.000539 U	<0.000532 U	<0.000581 U	0.000584	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000797 U
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorododecanesulfonic Acid (PFDOS)	79780-39-5	NS	NS	NS	mg/kg	NA	NA	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000199 U
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorohexanoic Acid (PFHxA)	307-24-4	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	mg/kg	NA	NA	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000199 U
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	**0.00088**	0.001	0.044	mg/kg	**0.00161**	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	**0.00107**	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	0.000843	<0.000199 U
Perfluorooctanoic Acid (PFOA)	335-67-1	**0.00066**	0.0008	0.033	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	**0.000879**	<0.000578 U	<0.000514 U	<0.000509 U	**0.00103**	<0.000545 U	<0.000199 U
Perfluoropentanesulfonic Acid	2706-91-4	NS	NS	NS	mg/kg	NA	NA	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000199 U
Perfluoropentanoic Acid (PFPeA)	2706-90-3	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.000399 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000398 U
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.0002 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000199 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	39108-34-4	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.000798 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000797 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	27619-97-2	NS	NS	NS	mg/kg	<0.000518 U	<0.000511 U	<0.000568 U	<0.000798 U	<0.000539 U	<0.000532 U	<0.000581 U	<0.000565 U	<0.000543 U	<0.000578 U	<0.000514 U	<0.000509 U	<0.000625 U	<0.000545 U	<0.000797 U
Tetrafluoro-2- (heptafluoropropoxy) propanoic Acid	13252-13-6	NS	NS	NS	mg/kg	NA	NA	NA	<0.000798 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.000797 U

Table 2
Supplemental Remedial Investigation Report
Soil Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688802

Notes:

CAS - Chemical Abstract Service
NS - No standard
mg/kg - milligram per kilogram
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, Protection of Groundwater, and Restricted Use Restricted-Residential Soil Cleanup Objectives (SCO).

Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Part 375 Remedial Programs Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) Unrestricted Use, Restricted Use Restricted-Residential, and Protection of Groundwater Guidance Values (April 2023).

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:

D - The concentration reported is a result of a diluted sample.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

P - The relative percent difference (RPD) between the results for the two columns exceeds the method-specified criteria.

U - The analyte was analyzed for, but was not detected at a level greater than or equal to the RL; the value shown in the table is the RL.

B - The analyte was found in the associated analysis batch blank.

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 Protection of Groundwater SCOs
10 - Result exceeds Restricted Use Restricted-Residential SCOs

Table 2A
Remedial Action Work Plan
Groundwater Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Location		LMW-5	LMW-5	LMW-5	LMW-7	LMW-7	LMW-8	LMW-9	LMW-10	LMW-11	LMW-12	LMW-13	LMW-14
Sample ID	NYSDEC SGVs	053_LMW-5	054_DUP-3	105_LMW-5	102_LMW-7	103_DUP-1	101_LMW-8	106_LMW-9	110_LMW-10	109_LMW-11	108_LMW-12	111_LMW-13	107_LMW-14
Laboratory ID		18E0702-01	18E0702-02	21D1189-05	21D1189-02	21D1189-03	21D1189-01	21D1189-06	21D1189-10	21D1189-09	21D1189-08	21D1189-11	21D1189-07
Sample Date		5/14/2018	5/14/2018	4/26/2021	4/26/2021	4/26/2021	4/26/2021	4/26/2021	4/26/2021	4/26/2021	4/26/2021	4/26/2021	4/26/2021
Volatile Organic Compounds (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	5	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	1	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloropropene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichloropropane	0.04	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U
1,2,4-Trichlorobenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trimethylbenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-Chloropropane	0.04	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U
1,2-Dibromoethane (Ethylene Dibromide)	0.0006	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U	*0.2* U
1,2-Dichlorobenzene	3	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	0.6	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	1	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene	3	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	3	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dioxane (P-Dioxane)	~	40 UJ	40 UJ	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
2,2-Dichloropropane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Chlorotoluene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone (MBK)	50	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
4-Chlorotoluene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acetone	50	2 U	2 U	1 U	1 U	1 U	2.93 J	22.2	2 U	1 U	3.27 J	1 U	1 U
Acrolein	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Acrylonitrile	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Benzene	1	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.36 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane	50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform	50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane	5	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
Carbon Disulfide	60	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.89	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon Tetrachloride	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.57	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform	7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.28 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Cis-1,2-Dichloroethene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Cis-1,3-Dichloropropene	0.4	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Cyclohexane	~	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane	50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane	5	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	0.5	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
Isopropylbenzene (Cumene)	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
M,P-Xylene	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl Acetate	~	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methyl Ethyl Ketone (2-Butanone)	50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.57	1.3	0.36 J	0.2 U	0.36 J	0.2 U	0.2 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	0.2 U
Methylcyclohexane	~	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Butylbenzene	5	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
n-Propylbenzene	5	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
o-Xylene (1,2-Dimethylbenzene)	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
p-Cymene (p-Isopropyltoluene)	~	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.92	0.2 U
Sec-Butylbenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Styrene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
T-Butylbenzene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tert-Butyl Alcohol	~	0.5 U	0.5 U	0.5 U	1.2 J	1.22 J	4.84	7.54	0.5 U	0.5 U	4.9	0.5 U	1.51 J
Tert-Butyl Methyl Ether	10	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.33 J	0.2 U	0.2 U
Tetrachloroethene (PCE)	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.61	0.2 U
Total Xylenes	5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Trans-1,2-Dichloroethene	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trans-1,3-Dichloropropene	0.4	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene (TCE)	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total BTEX	~	ND	ND	ND	ND	ND	0.36	ND	ND	ND	ND	0.61	ND
Total CVOCs	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs	~	ND	ND	ND	1.2	1.22	10.9	31	0.93	ND	8.86	1.53	1.51

Notes provided on Page 5.

Table 2A
Remedial Action Work Plan
Groundwater Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Location		LMW-5		LMW-5		LMW-5		LMW-7		LMW-7		LMW-8		LMW-9		LMW-10		LMW-11		LMW-12		LMW-13		LMW-14	
Sample ID	NYSDEC SGVs	053_LMW-5		054_DUP-3		105_LMW-5		102_LMW-7		103_DUP-1		101_LMW-8		106_LMW-9		110_LMW-10		109_LMW-11		108_LMW-12		111_LMW-13		107_LMW-14	
Laboratory ID		18E0702-01		18E0702-02		21D1189-05		21D1189-02		21D1189-03		21D1189-01		21D1189-06		21D1189-10		21D1189-09		21D1189-08		21D1189-11		21D1189-07	
Sample Date		5/14/2018		5/14/2018		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021	
Semivolatile Organic Compounds (µg/L)																									
1,2,4,5-Tetrachlorobenzene	5	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
1,2,4-Trichlorobenzene	5	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	UJ	2.86	UJ	2.78	UJ	2.78	UJ	2.7	U
1,2-Dichlorobenzene	3	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
1,2-Diphenylhydrazine	0	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
1,3-Dichlorobenzene	3	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
1,4-Dichlorobenzene	3	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2,3,4,6-Tetrachlorophenol	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2,4,5-Trichlorophenol	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2,4,6-Trichlorophenol	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2,4-Dichlorophenol	1	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2,4-Dimethylphenol	1	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2,4-Dinitrophenol	1	2.63	UJ	3.03	UJ	2.7	UJ	2.63	UJ	2.63	UJ	2.7	UJ	2.78	UJ	2.78	UJ	2.86	UJ	2.78	UJ	2.78	UJ	2.7	UJ
2,4-Dinitrotoluene	5	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2,6-Dinitrotoluene	5	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2-Chloronaphthalene	10	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2-Chlorophenol	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2-Methylnaphthalene	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2-Methylphenol (o-Cresol)	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2-Nitroaniline	5	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
2-Nitrophenol	~	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
3 & 4 Methylphenol (m&p Cresol)	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
3,3'-Dichlorobenzidine	5	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
3-Nitroaniline	5	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
4,6-Dinitro-2-Methylphenol	~	2.63	UJ	3.03	UJ	2.7	UJ	2.63	UJ	2.63	UJ	2.7	UJ	2.78	UJ	2.78	UJ	2.86	UJ	2.78	UJ	2.78	UJ	2.7	UJ
4-Bromophenyl Phenyl Ether	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
4-Chloro-3-Methylphenol	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
4-Chloroaniline	5	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
4-Chlorophenyl Phenyl Ether	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
4-Nitroaniline	5	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
4-Nitrophenol	~	5.26	U	6.06	U	5.41	U	5.26	U	5.26	U	5.41	U	5.56	U	5.56	U	5.71	U	5.56	U	5.56	U	5.41	U
Acenaphthene	20	0.0526	U	0.0606	U	0.0541	U	0.768		0.726		0.184		0.0556	U	0.0556	U	0.103		0.622		0.0556	U	2.63	
Acenaphthylene	~	0.0526	U	0.0606	U	0.0541	U	0.0526	U	0.0526	U	0.0541	U	0.0556	U	0.0556	U	0.0571	U	0.0556	U	0.0556	U	0.0541	U
Acetophenone	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Aniline (Phenylamine, Aminobenzene)	5	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Anthracene	50	0.0526	U	0.0606	U	0.0541	U	0.211		0.211		0.0649		0.0556		0.0556	U	0.0571	U	0.1		0.0556	U	0.0541	U
Atrazine	7.5	0.526	UJ	0.606	UJ	0.541	U	0.526	U	0.526	U	0.541	U	0.556	U	0.556	U	0.571	U	0.556	U	0.556	U	0.541	U
Benzaldehyde	~	2.63	U	3.03	U	2.7	UJ	2.63	UJ	2.63	UJ	2.7	UJ	2.78	UJ	2.78	UJ	2.86	UJ	2.78	UJ	2.78	UJ	2.7	UJ
Benzidine	5	5.26	UJ	6.06	UJ	5.41	UJ	5.26	UJ	5.26	UJ	5.41	UJ	5.56	UJ	5.56	UJ	5.71	UJ	5.56	UJ	5.56	UJ	5.41	UJ
Benzo(a)anthracene	0.002	**0.0632**		0.0606	U	0.0541	UJ	0.0526	UJ	0.0526	UJ	0.0541	UJ	0.0556	UJ	0.0556	UJ	0.0571	UJ	0.0556	UJ	0.0556	UJ	0.0541	UJ
Benzo(a)pyrene	0	**0.0526**	J	0.0606	UJ	0.0541	U	0.0526	U	0.0526	U	0.0541	U	0.0556	U	0.0556	U	0.0571	U	0.0556	U	0.0556	U	0.0541	U
Benzo(b)fluoranthene	0.002	0.0526	U	0.0606	U	0.0541	U	0.0526	U	0.0526	U	0.0541	U	0.0556	U	0.0556	U	0.0571	U	0.0556	U	0.0556	U	0.0541	U
Benzo(g,h,i)Perylene	~	0.0526	U	0.0606	U	0.0541	UJ	0.0526	UJ	0.0526	UJ	0.0541	UJ	0.0556	UJ	0.0556	UJ	0.0571	UJ	0.0556	UJ	0.0556	UJ	0.0541	UJ
Benzo(k)fluoranthene	0.002	0.0526	U	0.0606	U	0.0541	U	0.0526	U	0.0526	U	0.0541	U	0.0556	U	0.0556	U	0.0571	U	0.0556	U	0.0556	U	0.0541	U
Benzoic Acid	~	26.3	UJ	30.3	UJ	2.7	UJ	2.63	UJ	2.63	UJ	2.7	UJ	2.78	UJ	2.78	UJ	2.86	UJ	2.78	UJ	2.78	UJ	2.7	UJ
Benzyl Alcohol	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Benzyl Butyl Phthalate	50	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Biphenyl (Diphenyl)	5	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Bis(2-chloroethoxy) methane	5	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Bis(2-chloroethyl) ether (2-chloroethyl ether)	1	1.05	U	1.21	U	1.08	U	1.05	U	1.05	U	1.08	U	1.11	U	1.11	U	1.14	U	1.11	U	1.11	U	1.08	U
Bis(2-chloroisopropyl) ether	5	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Bis(2-ethylhexyl) phthalate	5	0.526	U	0.606	U	2.99	J	1.29	J	0.526	UJ	0.541	UJ	0.556	UJ	0.678	J	0.571	UJ	0.556	UJ	0.556	UJ	0.541	UJ
Caprolactam	~	2.63	U	3.03	U	2.7	UJ	2.63	UJ	2.63	UJ	2.7	UJ	2.78	UJ	2.78	U	2.86	U	2.78	U	2.78	U	2.7	UJ
Carbazole	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Chrysene	0.002	0.0526	U	0.0606	U	0.0541	U	0.0526	U	0.0526	U	0.0541	U	0.0556	U	0.0556	U	0.0571	U	0.0556	U	0.0556	U	0.0541	U
Dibenz(a,h)anthracene	~	0.0526	U	0.0606	U	0.0541	UJ	0.0526	UJ	0.0526	UJ	0.0541	UJ	0.0556	UJ	0.0556	UJ	0.0571	UJ	0.0556	UJ	0.0556	UJ	0.0541	UJ
Dibenzofuran	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Dibutyl phthalate	50	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Diethyl phthalate	50	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Dimethyl phthalate	50	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Dioctyl phthalate	50	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Fluoranthene	50	0.105		0.0727		0.0541	U	0.305		0.274		0.0649		0.0556	U	0.0556	U	0.0571	U	0.0556	U	0.0556	U	0.0541	
Fluorene	50	0.0526	U	0.0606	U	0.389	J	0.6	J	0.568	J	0.151	U	0.0556	U	0.367	J	0.0571	U	0.222	U	0.356	J	0.119	U
Hexachlorobenzene	0.04	0.0211	UJ	0.0242	UJ	0.0216	U	0.0211	U	0.0211	U	0.0216	U	0.0222	U	0.0222	U	0.0229	U	0.0222	U	0.0222	U	0.0216	U
Hexachlorobutadiene	0.5	0.526	U	0.606	U	0.541	U	0.526	U	0.526	U	0.541	U	0.556	U	0.556	U	0.571	U	0.556	U	0.556	U	0.541	U
Hexachlorocyclopentadiene	5	5.26	UJ	6.06	UJ	5.41	UJ	5.26	UJ	5.26	UJ	5.41	UJ	5.56	UJ	5.56	U	5.71	U	5.56	U	5.56	U	5.41	UJ
Hexachloroethane	5	0.526	UJ	0.606	UJ	0.541	U	0.526	U	0.526	U	0.541	U	0.556	U	0.556	U	0.571	U	0.556	U	0.556	U	0.541	U
Indeno(1,2,3-cd)pyrene	0.002	0.0526	U	0.0606	U	0.0541	UJ	0.0526	UJ	0.0526	UJ	0.0541	UJ	0.0556	UJ	0.0556	UJ	0.0571	UJ	0.0556	UJ	0.0556	UJ	0.0541	UJ
Isophorone	50	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Naphthalene	10	0.0526	U	0.0606	U	0.0541	U	0.789		0.726		0.259		0.0556		0.0556	U	0.0571	U	0.0778		0.0556	U	0.0541	U
Nitrobenzene	0.4	0.263	U	0.303	U	0.27	U	0.263	U	0.263	U	0.27	U	0.278	U	0.278	U	0.286	U	0.278	U	0.278	U	0.27	U
n-Nitrosodimethylamine	~	0.526	UJ	0.606	UJ	0.541	U	0.526	U	0.526	U	0.541	U	0.556	U	0.556	U	0.571	U	0.556	U	0.556	U	0.541	U
n-Nitrosodi-N-Propylamine	~	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
n-Nitrosodiphenylamine	50	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Pentachlorophenol	1	0.263	UJ	0.303	UJ	0.27	UJ	0.263	UJ	0.263	UJ	0.27	UJ	0.278	UJ	0.278	UJ	0.286	UJ	0.278	UJ	0.278	UJ	0.27	UJ
Phenanthrene	50	0.0526		0.0606	U	0.0541	U	1.13		1.04		0.216		0.0556	U	0.0556	U	0.0571		0.278		0.0556	U	0.0541	U
Phenol	1	2.63	U	3.03	U	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U
Pyrene	50	0.0737		0.0606	U	0.0541	U	0.211		0.189		0.0757	J	0.0556	U	0.0556	U	0.0571	U	0.0556	U	0.0556	U	0.0541	U
Pyridine	50	2.63	UJ	3.03	UJ	2.7	U	2.63	U	2.63	U	2.7	U	2.78	U	2.78	U	2.86	U	2.78	U	2.78	U	2.7	U

Notes provided on Page 5.

Table 2A
Remedial Action Work Plan
Groundwater Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Location		LMW-5		LMW-5		LMW-5		LMW-7		LMW-7		LMW-8		LMW-9		LMW-10		LMW-11		LMW-12		LMW-13		LMW-14	
Sample ID	NYSDEC	053_LMW-5		054_DUP-3		105_LMW-5		102_LMW-7		103_DUP-1		101_LMW-8		106_LMW-9		110_LMW-10		109_LMW-11		108_LMW-12		111_LMW-13		107_LMW-14	
Laboratory ID	SGVs	18E0702-01		18E0702-02		21D1189-05		21D1189-02		21D1189-03		21D1189-01		21D1189-06		21D1189-10		21D1189-09		21D1189-08		21D1189-11		21D1189-07	
Sample Date		5/14/2018		5/14/2018		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021	
Pesticides (µg/L)																									
4,4'-DDD	0.3	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
4,4'-DDE	0.2	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
4,4'-DDT	0.2	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Aldrin	0	*0.00457*	U	*0.00432*	UJ	*0.00421*	U	*0.00444*	U	*0.0041*	UJ	*0.0041*	U	*0.00421*	U	*0.004*	U	*0.0041*	U	*0.004*	U	*0.00421*	U	*0.004*	U
Alpha BHC (Alpha Hexachlorocyclohexane)	0.01	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Alpha Chlordane	~	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Alpha Endosulfan	~	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Beta Bhc (Beta Hexachlorocyclohexane)	0.04	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Beta Endosulfan	~	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Chlordane (alpha and gamma)	0.05	0.0229	U	0.0216	UJ	0.0105	U	0.0111	U	0.0103	UJ	0.0103	U	0.0105	U	0.01	U	0.0103	U	0.01	U	0.0105	U	0.01	U
Delta Bhc (Delta Hexachlorocyclohexane)	0.04	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Dieldrin	0.004	0.00229	U	0.00216	UJ	0.00211	U	0.00222	U	0.00205	UJ	0.00205	U	0.00211	U	0.002	U	0.00205	U	0.002	U	0.00211	U	0.002	U
Endosulfan Sulfate	~	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Endrin	0	*0.00457*	U	*0.00432*	UJ	*0.00421*	U	*0.00444*	U	*0.0041*	UJ	*0.0041*	U	*0.00421*	U	*0.004*	U	*0.0041*	U	*0.004*	U	*0.00421*	U	*0.004*	U
Endrin Aldehyde	5	0.0114	U	0.0108	UJ	0.0105	U	0.0111	U	0.0103	UJ	0.0103	U	0.0105	U	0.01	U	0.0103	U	0.01	U	0.0105	U	0.01	U
Endrin Ketone	5	0.0114	U	0.0108	UJ	0.0105	U	0.0111	U	0.0103	UJ	0.0103	U	0.0105	U	0.01	U	0.0103	U	0.01	U	0.0105	U	0.01	U
Gamma Bhc (Lindane)	0.05	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Gamma-Chlordane	~	0.0114	U	0.0108	UJ	0.0105	U	0.0111	U	0.0103	UJ	0.0103	U	0.0105	U	0.01	U	0.0103	U	0.01	U	0.0105	U	0.01	U
Heptachlor	0.04	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Heptachlor Epoxide	0.03	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Methoxychlor	35	0.00457	U	0.00432	UJ	0.00421	U	0.00444	U	0.0041	UJ	0.0041	U	0.00421	U	0.004	U	0.0041	U	0.004	U	0.00421	U	0.004	U
Toxaphene	0.06	*0.114*	U	*0.108*	UJ	*0.105*	U	*0.111*	U	*0.103*	UJ	*0.103*	U	*0.105*	U	*0.1*	U	*0.103*	U	*0.1*	U	*0.105*	U	*0.1*	U
Herbicides (µg/L)																									
2,4,5-T (Trichlorophenoxyacetic Acid)	35	NA		NA		5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
2,4-D (Dichlorophenoxyacetic Acid)	50	NA		NA		5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Silvex (2,4,5-Tp)	0.26	NA		NA		*5*	U	*5*	U	*5*	U	*5*	U	*5*	U	*5*	U	*5*	U	*5*	U	*5*	U	*5*	U
Polychlorinated Biphenyls (µg/L)																									
PCB-1016 (Aroclor 1016)	~	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U
PCB-1221 (Aroclor 1221)	~	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U
PCB-1232 (Aroclor 1232)	~	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U
PCB-1242 (Aroclor 1242)	~	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U
PCB-1248 (Aroclor 1248)	~	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U
PCB-1254 (Aroclor 1254)	~	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U
PCB-1260 (Aroclor 1260)	~	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U
Total PCBs	0.09	0.0571	UJ	0.0541	UJ	0.0526	U	0.0556	U	0.0513	U	0.0513	U	0.0526	U	0.05	U	0.0513	U	0.05	U	0.0526	U	0.05	U

Notes provided on Page 5.

Table 2A
Remedial Action Work Plan
Groundwater Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Location		LMW-5		LMW-5		LMW-5		LMW-7		LMW-7		LMW-8		LMW-9		LMW-10		LMW-11		LMW-12		LMW-13		LMW-14	
Sample ID	NYSDEC SGVs	053_LMW-5		054_DUP-3		105_LMW-5		102_LMW-7		103_DUP-1		101_LMW-8		106_LMW-9		110_LMW-10		109_LMW-11		108_LMW-12		111_LMW-13		107_LMW-14	
Laboratory ID		18E0702-01		18E0702-02		21D1189-05		21D1189-02		21D1189-03		21D1189-01		21D1189-06		21D1189-10		21D1189-09		21D1189-08		21D1189-11		21D1189-07	
Sample Date		5/14/2018		5/14/2018		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021	
Inorganics (µg/L)																									
Aluminum	~	480	J	260	J	55.6	U	61.3		55.6	U	59		55.6	U	94.1		55.6	U	65.1		55.6	U	55.6	U
Aluminum (Dissolved)	~	55.6	U	55.6	U	55.6	U	55.6	U	55.6	U	55.6	U	55.6	U	55.6	U	55.6	U	101		55.6	U	224	
Antimony	3	1.11	UJ	1.11	UJ	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U
Antimony (Dissolved)	3	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ
Arsenic	25	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	7.59	J	1.2		1.11	U	1.16		13.2		1.16		1.11	U
Arsenic (Dissolved)	25	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.96		1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U
Barium	1,000	506		497		406		320		325		144		306		492		789		**1600**		358		228	
Barium (Dissolved)	1,000	378		371		346		275		261		66.6		175		378		576		**1270**		237		209	
Beryllium	3	1.11	U	1.11	U	0.333	U	0.333	U	0.333	U	0.333	UJ	0.333	U	0.333	U	0.333	U	0.333	U	0.333	U	0.333	U
Beryllium (Dissolved)	3	1.11	UJ	1.11	UJ	0.333	UJ	0.333	UJ	0.333	UJ	0.333	UJ	0.333	UJ	0.333	UJ	0.333	UJ	0.333	UJ	0.333	UJ	0.333	UJ
Cadmium	5	1.11	U	1.11	U	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ
Cadmium (Dissolved)	5	1.11	U	1.11	U	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ	0.556	UJ
Calcium	~	225000	J	224000	J	225000		158000		160000		281000		117000		140000		185000		120000		162000		231000	
Calcium (Dissolved)	~	224000		220000		220000	B	157000	B	156000	B	276000	B	115000	B	133000	B	181000	B	119000	B	157000	B	226000	B
Chromium, Hexavalent	50	10	UJ	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chromium, Total	50	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U
Chromium, Total (Dissolved)	50	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U
Chromium, Trivalent	~	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Cobalt	~	5.56	U	5.56	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U
Cobalt (Dissolved)	~	5.56	U	5.56	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U	4.44	U
Copper	200	9.56	J	7.46		22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U
Copper (Dissolved)	200	5.56	J	5.56	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U	22.2	U
Cyanide	200	NA		NA		10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U
Iron	300	**32800**		**32500**		**13300**		**33200**		**33700**		**25900**		**28200**		**53200**		**41100**		**25300**		**47100**		**7580**	
Iron (Dissolved)	300	**7000**		**6980**		**7780**		**24800**		**22000**		278	U	278	U	**35000**		**22300**		**5600**		**20700**		**2020**	
Lead	25	**53.3**	J	**41.6**		5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U
Lead (Dissolved)	25	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U
Magnesium	35,000	23500		23200		21800		9910		9910		29400		22600		17400		15000		31900		15200		18400	
Magnesium (Dissolved)	35,000	23900		23000		21200		9700		9760		29500		22500		17100		15100		32800		15000		18100	
Manganese	300	**1030**		**1010**		**537**		**1180**		**1200**		**976**		**605**		**1240**		**569**		167		**370**		**400**	
Manganese (Dissolved)	300	**1030**		**999**		**517**		**1180**		**1160**		**871**		**582**		**1250**		**564**		160		**366**		**407**	
Mercury	0.7	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Mercury (Dissolved)	0.7	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Nickel	100	5.56	U	5.56	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U
Nickel (Dissolved)	100	5.56	U	5.56	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U
Potassium	~	13800		13200		12100		5040		4990		22400		25200		17200		9690		20500		7490		11200	
Potassium (Dissolved)	~	13000		12800		11400		5030		5060		22800		25900		17700		9800		19500		7550		11300	
Selenium	10	1.98	J	1.94	J	1.11	U	1.37	J	1.24	J	1.51	J	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U	1.11	U
Selenium (Dissolved)	10	1.84		2.27		1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ	1.11	UJ
Silver	50	5.56	UJ	5.56	UJ	5.56	U	5.56	U	5.56	U	5.56	UJ	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U
Silver (Dissolved)	50	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	UJ	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U	5.56	U
Sodium	20,000	**25900**	J	**25900**	J	**22100**		16300		16500		**55300**		**150000**		**49900**		**30600**		**70700**		**29300**		**21000**	
Sodium (Dissolved)	20,000	**25900**		**25800**		**21100**		15900		16100		**47100**		**145000**		**50100**		**30400**		**69000**		**29700**		19900	
Thallium	0.5	*1.11*	UJ	*1.11*	UJ	*1.11*	U	*1.11*	U	*1.11*	U	*1.11*	U	*1.11*	U	*1.11*	U	*1.11*	U	*1.11*	U	*1.11*	U	*1.11*	U
Thallium (Dissolved)	0.5	*1.11*	U	*1.11*	U	*1.11*	UJ	*1.11*	UJ	*1.11*	UJ	*1.11*	UJ	*1.11*	UJ	*1.11*	UJ	*1.11*	UJ	*1.11*	UJ	*1.11*	U	*1.11*	UJ
Vanadium	~	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U
Vanadium (Dissolved)	~	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U	11.1	U
Zinc	2,000	76.4		65.2		27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	81.5		52.9	
Zinc (Dissolved)	2,000	22.5	J	18.1		27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	27.8	U	49.7	

Notes provided on Page 5.

Table 2A
Remedial Action Work Plan
Groundwater Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Notes:
1. Groundwater 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 703.5 and the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water (herein collectively referenced as "NYSDEC SGVs").
2. Criterion comparisons for total xylenes and m,p-xylene are provided for reference. Promulgated NYSDEC SGVs are for o-xylene, m-xylene, and p-xylene.
3. Detected analytical results above NYSDEC SGVs are bolded and shaded.
4. Analytical results with reporting limits (RL) above NYSDEC SGVs are italicized.
5. Sample 054_DUP-3 is a duplicate sample of 053_LMW-5 and sample 103_DUP-1 is a duplicate sample of 102_LMW-7.
6. ~ = Regulatory limit for this analyte does not exist
7. µg/l = micrograms per liter
8. NA = Not analyzed
9. ND = Not detected

Qualifiers:
B = The analyte was found in the associated analysis batch blank.
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.

Table 2B
Remedial Action Work Plan
Groundwater Sample Analytical Results - Emerging Contaminants

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Location	NYSDEC June 2021 Guidance Values	LMW-5		LMW-7		LMW-7		LMW-8		LMW-9		LMW-10		LMW-11		LMW-12		LMW-13		LMW-14	
Sample ID		105_LMW-5		102_LMW-7		103_DUP-1		101_LMW-8		106_LMW-9		110_LMW-10		109_LMW-11		108_LMW-12		111_LMW-13		107_LMW-14	
2. Detected analytical results above NYSDEC June 2021 Guidance		21D1189-05		21D1189-02		21D1189-03		21D1189-01		21D1189-06		21D1189-10		21D1189-09		21D1189-08		21D1189-11		21D1189-07	
Sample Date		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021		4/26/2021	
Semivolatile Organic Compounds (µg/L)																					
1,4-Dioxane (P-Dioxane)	1,000	300	U	300	U	300	U	300	U	300	U	300	U	300	U	300	U	300	U	300	U
Per and Polyfluoroalkyl Substances (µg/L)																					
N-ethyl perfluorooctane- sulfonamidoacetic Acid (NEtFOSAA)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	2.52		1.94	U	1.89	U
N-methyl perfluorooctane- sulfonamidoacetic Acid (NMeFOSAA)	100	1.85	UJ	1.89	U	1.94	U	1.94	U	1.8	UJ	1.94	UJ	1.81	UJ	1.95	UJ	1.94	UJ	1.89	UJ
Perfluorobutanesulfonic Acid (PFBS)	100	1.85	U	3.73		3.72		5.33		3.87		1.94	U	1.82		4.82		2.32		1.99	
Perfluorobutanoic acid (PFBA)	100	3.61	J	11		9.41		15.7	J	14.5	J	3.53	J	2.45	J	10.1	J	3.07		2.52	
Perfluorodecanesulfonic Acid (PFDS)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Perfluorodecanoic Acid (PFDA)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Perfluorododecanoic Acid (PFDoA)	100	1.85	UJ	1.89	UJ	1.94	UJ	1.94	UJ	1.8	UJ	1.94	UJ	1.81	UJ	1.95	UJ	1.94	UJ	1.89	UJ
Perfluoroheptanesulfonic Acid (PFHpS)	100	1.85	U	1.91		1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Perfluoroheptanoic acid (PFHpA)	100	3.59		25.3		24.8		23.5		41.4		5.74		4.46		12.3		3.5		2.81	
Perfluorohexanesulfonic Acid (PFHxS)	100	2.06		24.2		24.7		4.55		8.07	J	1.94	U	1.81	U	6.76	J	1.94	U	1.89	U
Perfluorohexanoic Acid (PFHxA)	100	1.85	U	12.5		11.7		34.1		18.2		3.59		2.33		7.71		2.83		1.89	U
Perfluorononanoic Acid (PFNA)	100	1.85	U	2.09		2.01		1.94	U	2.14	J	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Perfluorooctanesulfonamide (FOSA)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Perfluorooctanesulfonic Acid (PFOS)	10	2.72		**27.5**		**26.3**		5.33	J	**10.1**	J	3.27		1.81	U	**23.4**	J	5.62		3.26	
Perfluorooctanoic Acid (PFOA)	10	**29.3**		**43.4**		**39.8**		**73.5**		**169**		**30.3**		**32.6**		**70.3**		**24.9**		**18.4**	
Perfluoropentanoic Acid (PFPeA)	100	1.89		7.58		7.7		24.2		21.4	J	3.98		1.81	U	9.82		1.94	U	1.89	U
Perfluorotetradecanoic Acid (PFTA)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Perfluorotridecanoic Acid (PFTrDA)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Perfluoroundecanoic Acid (PFUnA)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2) (8:2FTS)	100	1.85	U	1.89	U	1.94	U	1.94	U	1.8	U	1.94	U	1.81	U	1.95	U	1.94	U	1.89	U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2) (6:2FTS)	100	4.63	U	4.73	U	4.84	U	4.84	U	4.5	U	4.84	U	4.53	U	4.88	U	4.84	U	4.73	U
Total PFAS	500	43.2		159		150		186		289		50.4		43.7		148		42.2		29	

Notes Provided on Page 2.

Table 2B
Remedial Action Work Plan
Groundwater Sample Analytical Results - Emerging Contaminants

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Notes:

1. Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Part 375 Remedial Programs Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) (June 2021) and the 1,4-Dioxane value reflects the drinking water maximum contaminant level (MCL) adopted by New York State for public water systems (July 2020). Pursuant to Part 375-1.7(f)(2), the NYSDEC will treat the MCL as relevant and appropriate and will consider this value in remedy selection.
2. Detected analytical results above NYSDEC June 2021 Guidance Values are bolded and shaded.
3. Analytical results with reporting limits (RL) above NYSDEC June 2021 Guidance Values are italicized.
4. Sample 103_DUP-1 is a duplicate sample of 102_LMW-7.
5. ng/l = nanograms per liter

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
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.

Table 3A
Remedial Action Work Plan
Soil Vapor Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Location	NYSDOH Decision Matrices Minimum Concnetrations	AMBIENT-1		LSV-1		LSV-2		LSV-2		LSV-3		LSV-4		LSV-5		LSV-6		LSV-7		LSV-8	
Sample ID		099_AMBIENT-1		091_LSV-1		092_LSV-2		100_DUP-1		093_LSV-3		094_LSV-4		095_LSV-5		096_LSV-6		097_LSV-7		098_LSV-8	
Laboratory ID		21D0856-09		21D0856-01		21D0856-02		21D0856-10		21D0856-03		21D0856-04		21D0856-05		21D0856-06		21D0856-07		21D0856-08	
Sample Date		4/19/2021		4/19/2021		4/19/2021		4/19/2021		4/19/2021		4/19/2021		4/19/2021		4/19/2021		4/19/2021		4/19/2021	
sample Type		AA		SV		SV		SV		SV		SV		SV		SV		SV		SV	
Volatile Organic Compounds (µg/m³)																					
1,1,1,2-Tetrachloroethane	~	0.77	U	2	U	1.1	U	1	U	2.2	U	1.1	U	1.2	U	2.2	U	2.1	U	1.1	U
1,1,1-Trichloroethane	100	0.61	U	1.6	U	0.86	U	0.82	U	1.7	U	0.91	U	0.92	U	1.8	U	1.7	U	0.85	U
1,1,2,2-Tetrachloroethane	~	0.77	U	2	U	1.1	U	1	U	2.2	U	1.1	U	1.2	U	2.2	U	2.1	U	1.1	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	~	0.86	U	2.3	U	1.2	U	1.1	U	2.4	U	1.3	U	1.3	U	2.5	U	2.3	U	1.2	U
1,1,2-Trichloroethane	~	0.61	U	1.6	U	0.86	U	0.82	U	1.7	U	0.91	U	0.92	U	1.8	U	1.7	U	0.85	U
1,1-Dichloroethane	~	0.45	U	1.2	U	0.64	U	0.61	U	1.3	U	0.68	U	0.68	U	1.3	U	1.2	U	0.63	U
1,1-Dichloroethene	6	0.11	U	0.29	U	0.16	U	0.15	U	0.31	U	0.17	U	0.17	U	0.32	U	0.3	U	0.15	U
1,2,4-Trichlorobenzene	~	0.83	U	2.2	U	1.2	U	1.1	U	2.3	U	1.2	U	1.2	U	2.4	U	2.3	U	1.2	U
1,2,4-Trimethylbenzene	~	0.55	U	1.5	U	1.5	D	1.4	D	2.2	D	9	D	4.8	D	2.4	D	8.7	D	3.2	D
1,2-Dibromoethane (Ethylene Dibromide)	~	0.86	U	2.3	U	1.2	U	1.2	U	2.4	U	1.3	U	1.3	U	2.5	U	2.4	U	1.2	U
1,2-Dichlorobenzene	~	0.68	U	1.8	U	0.95	U	0.9	U	1.9	U	1	U	1	U	1.9	U	1.8	U	0.94	U
1,2-Dichloroethane	~	0.45	U	1.2	U	0.64	U	0.61	U	1.3	U	0.68	U	0.68	U	1.3	U	1.2	U	0.63	U
1,2-Dichloropropane	~	0.52	U	1.4	U	0.73	U	0.69	U	1.5	U	0.77	U	0.78	U	1.5	U	1.4	U	0.72	U
1,2-Dichlorotetrafluoroethane	~	0.79	U	2.1	U	1.1	U	1	U	2.2	U	1.2	U	1.2	U	2.3	U	2.1	U	1.1	U
1,3,5-Trimethylbenzene (Mesitylene)	~	0.55	U	1.5	U	0.77	U	0.74	U	1.5	U	5.4	D	4.1	D	1.6	U	2.7	D	0.99	D
1,3-Butadiene	~	0.75	U	2	U	1	U	0.99	U	2.1	U	1.1	U	1.1	U	2.1	U	2	U	1	U
1,3-Dichlorobenzene	~	0.68	U	1.8	U	0.95	U	0.9	U	1.9	U	1	U	1	U	1.9	U	1.8	U	7.8	D
1,3-Dichloropropane	~	0.52	U	1.4	U	0.73	U	0.69	U	1.5	U	0.77	U	0.78	U	1.5	U	1.4	U	0.72	U
1,4-Dichlorobenzene	~	0.68	U	1.8	U	0.95	U	0.9	U	1.9	U	1.3	D	1	U	1.9	U	1.8	U	0.94	U
1,4-Dioxane (P-Dioxane)	~	0.81	U	2.1	U	1.1	U	1.1	U	2.3	U	1.2	U	1.2	U	2.3	U	2.2	U	1.1	U
2-Hexanone (MBK)	~	0.92	U	2.4	U	1.3	U	1.2	U	2.6	U	1.4	U	1.4	U	2.7	U	2.5	U	1.3	U
4-Ethyltoluene	~	0.55	U	1.5	U	1.3	D	1.2	D	1.5	U	5.6	D	1.3	D	1.8	D	6.9	D	3	D
Acetone	~	9	D	47	D	5.1	J	8.1	J	41	D	120	D	26	D	21	D	120	D	81	D
Acrylonitrile	~	0.24	U	0.64	U	0.34	U	0.33	U	0.68	U	0.36	U	0.37	U	0.7	U	0.66	U	0.34	U
Allyl Chloride (3-Chloropropene)	~	1.8	U	4.6	U	2.5	U	2.3	U	4.9	U	2.6	U	2.6	U	5.1	U	4.8	U	2.4	U
Benzene	~	0.68	D	1.2	D	0.75	D	0.81	D	3.3	D	19	D	23	D	3.3	D	3.3	D	3.9	D
Benzyl Chloride	~	0.58	U	1.5	U	0.81	U	0.78	U	1.6	U	0.86	U	0.87	U	1.7	U	1.6	U	0.81	U
Bromodichloromethane	~	0.75	U	2	U	1.1	U	1	U	2.1	U	1.1	U	1.1	U	2.2	U	2.1	U	1	U
Bromoethene	~	0.49	U	1.3	U	0.69	U	0.66	U	1.4	U	0.73	U	0.74	U	1.4	U	1.3	U	0.68	U
Bromoform	~	1.2	U	3.1	U	1.6	U	1.5	U	3.3	U	1.7	U	1.7	U	3.3	U	3.2	U	1.6	U
Bromomethane	~	0.44	U	1.1	U	0.61	U	0.58	U	1.2	U	0.65	U	0.65	U	1.3	U	1.2	U	0.6	U
Carbon Disulfide	~	0.35	U	45	D	19	D	18	D	160	D	12	D	1.8	D	16	D	11	D	0.73	D
Carbon Tetrachloride	6	0.57	D	0.46	U	0.25	U	0.24	U	0.5	U	0.26	U	0.26	U	0.51	U	0.48	U	0.24	U
Chlorobenzene	~	0.52	U	1.4	U	0.72	U	0.69	U	1.5	U	1.8	D	0.78	U	1.5	U	3.5	D	0.72	D
Chloroethane	~	0.3	U	0.78	U	0.41	U	0.4	U	0.83	U	0.44	U	0.44	U	0.85	U	0.81	U	0.41	U
Chloroform	~	0.55	U	1.4	U	0.77	U	0.73	U	1.5	U	0.81	U	0.82	U	1.6	U	1.5	U	0.76	U
Chloromethane	~	1.4	D	0.61	U	0.32	U	0.31	U	0.65	U	0.34	U	0.35	U	0.67	U	0.63	U	0.32	U
Cis-1,2-Dichloroethene	6	0.11	U	0.29	U	0.16	U	0.15	U	2	D	**7.3**	D	0.17	U	0.32	U	5.1	D	0.15	U
Cis-1,3-Dichloropropene	~	0.51	U	1.3	U	0.71	U	0.68	U	1.4	U	0.76	U	0.76	U	1.5	U	1.4	U	0.71	U
Cyclohexane	~	0.39	U	1.9	D	1.4	D	1.5	D	170	D	34	D	40	D	270	D	180	D	1.2	D
Dibromochloromethane	~	0.96	U	2.5	U	1.3	U	1.3	U	2.7	U	1.4	U	1.4	U	2.8	U	2.6	U	1.3	U
Dichlorodifluoromethane	~	2.3	D	1.5	U	1.3	D	1.3	D	2.6	D	12	D	1.8	D	190	D	1.5	U	6.2	D
Ethyl Acetate	~	0.81	U	2.1	U	1.1	U	1.1	U	2.3	U	1.2	U	1.2	U	20	D	18	D	1.9	D
Ethylbenzene	~	1.2	D	1.9	D	1.2	D	0.91	D	6.7	D	6.3	D	4	D	3.4	D	5.7	D	2	D
Hexachlorobutadiene	~	1.2	D	3.1	U	1.7	U	1.6	U	3.4	U	1.8	U	1.8	U	3.5	U	3.3	U	1.7	U
Isopropanol	~	13	J	1.5	UJ	2.9	J	6	J	1.5	UJ	5.4	J	3.4	J	3.3	J	4.3	J	8.1	J
M,P-Xylene	~	6	D	2.7	D	5.3	D	4	D	13	D	13	D	6.8	D	7.3	D	14	D	7.4	D
Methyl Ethyl Ketone (2-Butanone)	~	0.83	D	11	D	5.7	D	5.6	D	17	D	39	D	9.7	D	8.1	D	29	D	47	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.46	U	1.2	U	1.4	D	0.61	U	1.3	U	0.68	U	0.69	U	34	D	1.3	U	0.64	U
Methyl Methacrylate	~	0.51	D	1.2	U	0.64	U	0.61	U	1.3	U	0.68	U	0.69	U	1.3	U	17	D	0.96	D
Methylene Chloride	100	20	D	20	D	3.1	J	1.6	J	2.2	U	1.9	J	1.9	J	5.7	J	11	D	4.6	J
n-Heptane	~	0.46	U	9.1	D	1	D	0.92	D	1.3	U	21	D	34	D	41	D	40	D	3.3	D
n-Hexane	~	0.75	D	19	D	2	D	2	D	160	D	72	D	130	D	160	D	290	D	6.9	D
o-Xylene (1,2-Dimethylbenzene)	~	1.4	D	1.3	U	2	D	1.8	D	1.4	U	6.7	D	2.9	D	2.4	D	10	D	3	D
Propylene	~	0.97	D	54	D	2.5	D	2.5	D	130	D	0.29	U	0.29	U	0.56	U	0.53	U	0.27	U
Styrene	~	0.48	U	1.3	U	0.67	U	0.64	U	1.3	U	0.71	U	0.72	U	1.4	U	1.3	U	0.66	U
Tert-Butyl Methyl Ether	~	0.4	U	1.1	U	0.57	U	0.54	U	1.1	U	0.6	U	0.61	U	1.2	U	1.1	U	0.56	U
Tetrachloroethene (PCE)	100	0.76	U	2	U	1.8	D	2	D	2.1	U	3.2	D	1.3	D	2.2	U	2.7	D	1.1	U
Tetrahydrofuran	~	0.66	U	1.7	U	16	D	16	D	1.9	U	0.98	U	0.99	U	1.9	U	1.8	U	160	D
Toluene	~	2.1	D	5.1	D	2.4	D	2.4	D	2.7	D	14	D	9.4	D	3.3	D	8.9	D	7.6	D
Trans-1,2-Dichloroethene	~	0.45	U	1.2	U	0.62	U	0.59	U	1.2	U	0.99	D	0.67	U	1.3	U	1.2	U	0.62	U
Trans-1,3-Dichloropropene	~	0.51	U	1.3	U	0.71	U	0.68	U	1.4	U	0.76	U	0.76	U	1.5	U	1.4	U	0.71	U
Trichloroethene (TCE)	6	0.15	U	0.4	U	0.25	D	0.2	U	0.42	U	0.22	U	0.23	U	0.44	U	0.41	U	0.21	U
Trichlorofluoromethane	~	1.8	D	1.7	U	4.9	D	5.1	D	1.8	U	0.94	D	0.95	U	1.8	U	1.7	U	2.4	D
Vinyl Acetate	~	0.4	U	1	U	0.55	U	0.53	U	1.1	U	0.59	U	0.59	U	1.1	U	2	D	0.55	U
Vinyl Chloride	6	0.14	U	0.38	U	0.2	U	0.19	U	4.8	D	**22**	D	0.22	U	0.41	U	2.3	D	0.2	U
Total BTEX	~	11.4		10.9		11.7		9.92		25.7		59		46.1		19.7		41.9		23.9	
Total CVOCs	~	20.6		20		5.15		3.6		6.8		34.4		3.2		5.7		21.1		4.6	

Notes provided on Page 2.

Table 3A
Remedial Action Work Plan
Soil Vapor Sample Analytical Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

Notes:

1. Soil vapor sample analytical results are compared to the minimum soil vapor concentrations at which mitigation is recommended as set forth in the New York State Department of Health (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).
2. Ambient air sample analytical results are shown for reference only.
3. Detected analytical results above the minimum soil vapor concentrations recommending mitigation are bolded and shaded.
4. Analytical results with reporting limits (RL) above the minimum soil vapor concentrations recommending mitigation are italicized.
5. Sample 100_DUP-1 is a duplicate of parent sample 092_LSV-2.
6. ~ = Regulatory limit for this analyte does not exist
7. $\mu g/m^3$ = micrograms per cubic meter
8. AA = Ambient Air
9. SV = Soil Vapor

Qualifiers:

D = The concentration reported is a result of a diluted sample.
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
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.

Table 3B
Remedial Action Work Plan
Methane Monitoring Results

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

	Off-Site								**On-Site**
Location	LSB-1	LSB-3	LSB-4	LSB-7	LSB-9	LSB-11	LSB-13	LSB-13	LSB-19
Date	5/11/2018	5/11/2018	5/11/2018	5/11/2018	5/9/2018	5/9/2018	5/9/2018	5/9/2018	5/8/2018
Sample Depth (feet bsl)	8	8	8	8	8	8	5	15	10
Monitoring/Purge Time (minutes)	**Methane Readings (%)**								
0	0	0	0	0	0	0	0	0	0
0.5	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
1.5	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
2.5	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
3.5	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
4.5	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0

Table 4
Remedial Action Work Plan
Soil Cleanup Objectives

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290

Analyte	CAS Number	Track 1 NYSDEC Part 375 Unrestricted Use SCOs	Track 2 NYSDEC Part 375 Restricted Use Restricted-Residential SCOs
Volatile Organic Compounds (mg/kg)			
1,1,1-Trichloroethane	71-55-6	0.68	100
1,1-Dichloroethane	75-34-3	0.27	26
1,1-Dichloroethene	75-35-4	0.33	100
1,2,4-Trimethylbenzene	95-63-6	3.6	52
1,2-Dichlorobenzene	95-50-1	1.1	100
1,2-Dichloroethane	107-06-2	0.02	3.1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	8.4	52
1,3-Dichlorobenzene	541-73-1	2.4	49
1,4-Dichlorobenzene	106-46-7	1.8	13
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13
Acetone	67-64-1	0.05	100
Benzene	71-43-2	0.06	4.8
Carbon Tetrachloride	56-23-5	0.76	2.4
Chlorobenzene	108-90-7	1.1	100
Chloroform	67-66-3	0.37	49
Cis-1,2-Dichloroethene	156-59-2	0.25	100
Ethylbenzene	100-41-4	1	41
Hexachlorobenzene	118-74-1	0.33	1.2
Methyl Ethyl Ketone (2-Butanone)	78-93-3	0.12	100
Methylene Chloride	75-09-2	0.05	100
Naphthalene	91-20-3	12	100
n-Butylbenzene	104-51-8	12	100
n-Propylbenzene	103-65-1	3.9	100
Sec-Butylbenzene	135-98-8	11	100
T-Butylbenzene	98-06-6	5.9	100
Tert-Butyl Methyl Ether	1634-04-4	0.93	100
Tetrachloroethene (PCE)	127-18-4	1.3	19
Toluene	108-88-3	0.7	100
Total Xylenes	1330-20-7	0.26	100
Trans-1,2-Dichloroethene	156-60-5	0.19	100
Trichloroethene (TCE)	79-01-6	0.47	21
Vinyl Chloride	75-01-4	0.02	0.9
Semivolatile Organic Compounds (mg/kg)			
1,2-Dichlorobenzene	95-50-1	1.1	100
1,3-Dichlorobenzene	541-73-1	2.4	49
1,4-Dichlorobenzene	106-46-7	1.8	13
1,4-Dioxane (P-Dioxane)	123-91-1	0.1	13
2-Methylphenol (o-Cresol)	95-48-7	0.33	100
3 & 4 Methylphenol (m&p Cresol)	65794-96-9	0.33	100
Acenaphthene	83-32-9	20	100
Acenaphthylene	208-96-8	100	100
Anthracene	120-12-7	100	100
Benzo(a)anthracene	56-55-3	1	1
Benzo(a)pyrene	50-32-8	1	1
Benzo(b)fluoranthene	205-99-2	1	1
Benzo(g,h,i)Perylene	191-24-2	100	100
Benzo(k)fluoranthene	207-08-9	0.8	3.9
Chrysene	218-01-9	1	3.9
Dibenz(a,h)anthracene	53-70-3	0.33	0.33
Dibenzofuran	132-64-9	7	59
Fluoranthene	206-44-0	100	100
Fluorene	86-73-7	30	100
Hexachlorobenzene	118-74-1	0.33	1.2
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	0.5
Naphthalene	91-20-3	12	100
Pentachlorophenol	87-86-5	0.8	6.7
Phenanthrene	85-01-8	100	100
Phenol	108-95-2	0.33	100
Pyrene	129-00-0	100	100

Table 4
Remedial Action Work Plan
Soil Cleanup Objectives

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290

Analyte	CAS Number	Track 1 NYSDEC Part 375 Unrestricted Use SCOs	Track 2 NYSDEC Part 375 Restricted Use Restricted-Residential SCOs
Pesticides (mg/kg)			
4,4'-DDD	72-54-8	0.0033	13
4,4'-DDE	72-55-9	0.0033	8.9
4,4'-DDT	50-29-3	0.0033	7.9
Aldrin	309-00-2	0.005	0.097
Alpha BHC (Alpha Hexachlorocyclohexane	319-84-6	0.02	0.48
Alpha Chlordane	5103-71-9	0.094	4.2
Alpha Endosulfan	959-98-8	2.4	24
Beta Bhc (Beta Hexachlorocyclohexane)	319-85-7	0.036	0.36
Beta Endosulfan	33213-65-9	2.4	24
Delta Bhc (Delta Hexachlorocyclohexane)	319-86-8	0.04	100
Dibenzofuran	132-64-9	7	59
Dieldrin	60-57-1	0.005	0.2
Endosulfan Sulfate	1031-07-8	2.4	24
Endrin	72-20-8	0.014	11
Gamma Bhc (Lindane)	58-89-9	0.1	1.3
Heptachlor	76-44-8	0.042	2.1
Herbicides (mg/kg)			
Silvex (2,4,5-Tp)	93-72-1	3.8	100
Polychlorinated Biphenyls (mg/kg)			
Total PCBs	1336-36-3	0.1	1
Inorganics (mg/kg)			
Arsenic	7440-38-2	13	16
Barium	7440-39-3	350	400
Beryllium	7440-41-7	7.2	72
Cadmium	7440-43-9	2.5	4.3
Chromium, Hexavalent	18540-29-9	1	110
Chromium, Trivalent	16065-83-1	30	180
Copper	7440-50-8	50	270
Total Cyanide	~	27	27
Lead	7439-92-1	63	400
Manganese	7439-96-5	1,600	2,000
Mercury	7439-97-6	0.18	0.81
Nickel	7440-02-0	30	310
Selenium	7782-49-2	3.9	180
Silver	7440-22-4	2	180
Zinc	7440-66-6	109	10,000

Notes:
1. Soil cleanup objectives taken from 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 Restricted Use Restricted-Residential Soil Cleanup Objectives (SCOs).
2. Criterion comparisons for 3- & 4-methylphenol (m&p cresol) are provided for reference. Promulgated SCOs are for 3-methylphenol (m-cresol) and
3. ~ = Regulatory limit for this analyte does not exist
4. mg/kg = milligrams per kilogram

Table 5
Remedial Action Work Plan
Track 1 Remedial Cost Estimate

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	SITE PREPARATION COST
CONTRACTOR FEES					
1	Remediation Facilities, Mobilization, Demobilization, and Site Maintenance - Remediation and decontamination facilities, site fencing, trailer, truck cleaning facilities, etc.		Allowance		$ 100,000.00
2	Excavation Dewatering		Allowance		$ 885,000.00
3	Management and Handling of Contaminated Material (Remedial Excavation)	44,000	CY	$ 30.00	$ 1,320,000.00
4	Perimeter Support of Excavation (SOE) - assumes 25-foot length around the Site perimeter	26,325	SF	$ 125.00	$ 3,290,625.00
5	Off-Site Transport and Disposal of Non-hazardous Contaminated Fill Material and Soil	66,000	Ton	$ 60.00	$ 3,960,000.00
6	Dust, Odor, and Vapor Control	6	Months	$ 2,000.00	$ 12,000.00
7	Underground Storage Tank Removal	1	Each	$ 25,000.00	$ 25,000.00
8	Vapor Barrier/Waterproofing Membrane Installation	68,000	SF	$ 12.00	$ 816,000.00
9	Import of approved material for remedial excavation backfill and to raise Site grade	2,000	CY	$ 65.00	$ 130,000.00
				CONTRACTOR FEE ESTIMATED SUBTOTAL:	*$ 10,538,625.00*
				(15% CONTINGENCY OF CONTRACTOR FEE ESTIMATED SUBTOTAL):	*$ 1,580,793.75*
ENGINEERING FEES					
1	Construction Administration	6	Months	$ 10,000.00	$ 60,000.00
2	SOE Design		Allowance		$ 45,000.00
3	Construction Environmental Monitoring (includes community air monitoring program [CAMP] equipment rental)	6	Months	$ 38,000.00	$ 228,000.00
4	Special Inspection - Includes engineering special inspections for SOE installation and foundation construction	6	Months	$ 35,000.00	$ 210,000.00
5	Post-Excavation Confirmation Endpoint Sampling	19	Samples	$ 1,350.00	$ 25,650.00
6	Legal Fees		Allowance		$ 40,000.00
7	Remedial Investigation, Remedial Investigation Report, Remedial Action Work Plan (including CHASP)		Allowance		$ 175,000.00
8	Regulatory Agency Required Reporting (monthly progress reports, Final Engineering Report [FER], Data Validation & EQuIS Submittals, CPP and fact sheets)		Allowance		$ 150,000.00
				ENGINEERING FEE ESTIMATED SUBTOTAL:	*$ 933,650.00*
				(15% CONTINGENCY OF ENGINEERING FEE ESTIMATED SUBTOTAL):	*$ 140,047.50*
				ESTIMATED REMEDIATION COST - ALTERNATIVE I:	**$ 13,200,000.00**

General Assumptions and Conditions:

1. The density used for conversion from cubic yards to tons was 1.5 tons per cubic yard.
2. Excavation depths were estimated using Remedial Investigation observations and soil sample results.
3. A 6 month period is assumed for remediation and soil handling.
4. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual fee. Utilization of this fee estimate information beyond the stated purpose is not recommended. Langan is not licensed to provide financial or legal consulting services; as such, this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.

Contractor Cost Assumptions:

-RAWP Item No. 2 - Discharge fees are excluded from the excavation dewatering costs.

-RAWP Item No. 4 - The perimeter SOE is generally expected to include the installation of drilled soldier piles with lagging and tieback anchors.

-RAWP Item No. 5 - The unit rate provided reflects average disposal facility fees and may vary depending on time of year and facility.

-RAWP Item No. 6 - Cost estimate includes application of vapor/odor suppressing foam to open excavations and soil loaded into trucks. Labor provided by excavation, handling, and disposal contractor provided above; this line item estimate reflects material, freight, and equipment fees.

-Costs provided above exclude limited profit, insurance, bonding, and general conditions.

Engineering Fee Assumptions:

-Engineering Item No. 4 - Special inspections as required by the New York City Department of Building.

-Engineering Item No. 5 - The cost assumes collection of 14 samples plus quality assurance/quality control samples. Sample analysis will be for Part 375 VOCs, SVOCs, PCBs, pesticides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane. Fee includes subcontracted laboratory analysis by a NYSDOH ELAP-certified laboratory and ASP Category B deliverables.

Table 6
Remedial Action Work Plan
Track 2 Remedial Cost Estimate

12096 Flatlands Avenue
Brooklyn, New York
NYSDEC BCP Site No.: C224290
Langan Project No.: 100688801

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	SITE PREPARATION COST
CONTRACTOR FEES					
1	Remediation Facilities, Mobilization, Demobilization, and Site Maintenance - Remediation and decontamination facilities, site fencing, trailer, truck cleaning facilities, etc.		Allowance		$ 100,000.00
2	Excavation Dewatering		Allowance		$ 885,000.00
3	Management and Handling of Contaminated Material (Remedial Excavation)	44,000	CY	$ 30.00	$ 1,320,000.00
4	Perimeter Support of Excavation (SOE) - assumes 18-foot length around the Site perimeter	26,325	SF	$ 125.00	$ 3,290,625.00
5	Off-Site Transport and Disposal of Non-hazardous Contaminated Fill Material and Soil	66,000	Ton	$ 60.00	$ 3,960,000.00
6	Dust, Odor, and Vapor Control	6	Months	$ 2,000.00	$ 12,000.00
7	Underground Storage Tank Removal	1	Each	$ 25,000.00	$ 25,000.00
8	Vapor Barrier/Waterproofing Membrane Installation	68,000	SF	$ 12.00	$ 816,000.00
9	Import of approved material for remedial excavation backfill and to raise Site grades	2,000	CY	$ 65.00	$ 130,000.00
	CONTRACTOR FEE ESTIMATED SUBTOTAL:				*$ 10,538,625.00*
	(15% CONTINGENCY OF CONTRACTOR FEE ESTIMATED SUBTOTAL):				*$ 1,580,793.75*
ENGINEERING FEES					
1	Construction Administration	6	Months	$ 10,000.00	$ 60,000.00
2	SOE Design		Allowance		$ 45,000.00
3	Construction Environmental Monitoring (includes community air monitoring program [CAMP] equipment rental)	6	Months	$ 38,000.00	$ 228,000.00
4	Special Inspection - Includes engineering special inspections for SOE installation and foundation construction	6	Months	$ 35,000.00	$ 210,000.00
5	Post-Excavation Documentation Endpoint Sampling	19	Samples	$ 1,350.00	$ 25,650.00
6	Legal Fees		Allowance		$ 60,000.00
7	Remedial Investigation, Remedial Investigation Report, Remedial Action Work Plan (including CHASP)		Allowance		$ 175,000.00
8	Regulatory Agency Required Reporting (monthly, progress reports, Final Engineering Report [FER], Data Validation & EQuIS Submittals, CPP and fact sheets)		Allowance		$ 150,000.00
9	Operation and Maintenance - as required for inspection of IC implementation	10	years	4,000	$ 40,000.00
10	Institutional Control Certification - Accounts for fees associated with preparation and submission of annual Periodic Review Reports for ten years.	10	years	4,000	$ 40,000.00
	ENGINEERING FEE ESTIMATED SUBTOTAL:				*$ 1,033,650.00*
	(15% CONTINGENCY OF ENGINEERING FEE ESTIMATED SUBTOTAL):				*$ 155,047.50*
	ESTIMATED REMEDIATION COST - ALTERNATIVE II:				**$ 13,310,000.00**

General Assumptions and Conditions:

1. The density used for conversion from cubic yards to tons was 1.5 tons per cubic yard.
2. Excavation depths were estimated using Remedial Investigation soil sample results.
3. A 6 month period is assumed for remediation and soil handling.
4. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual fee. Utilization of this fee estimate information beyond the stated purpose is not recommended. Langan is not licensed to provide financial or legal consulting services; as such, this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.

Contractor Cost Assumptions:

-RAWP Item No. 2 - Discharge fees are excluded from the excavation dewatering costs.

-RAWP Item No. 4 - The perimeter SOE is generally expected to include the installation of drilled soldier piles with lagging and tieback anchors.

-RAWP Item No. 5 - The unit rate provided reflects average disposal facility fees and may vary depending on time of year and facility.

-RAWP Item No. 6 - Cost estimate includes application of vapor/odor suppressing foam to open excavations and soil loaded into trucks. Labor provided by excavation, handling, and disposal contractor provided above; this line item estimate reflects material, freight, and equipment fees.

-Costs provided above exclude limited profit, insurance, bonding, and general conditions.

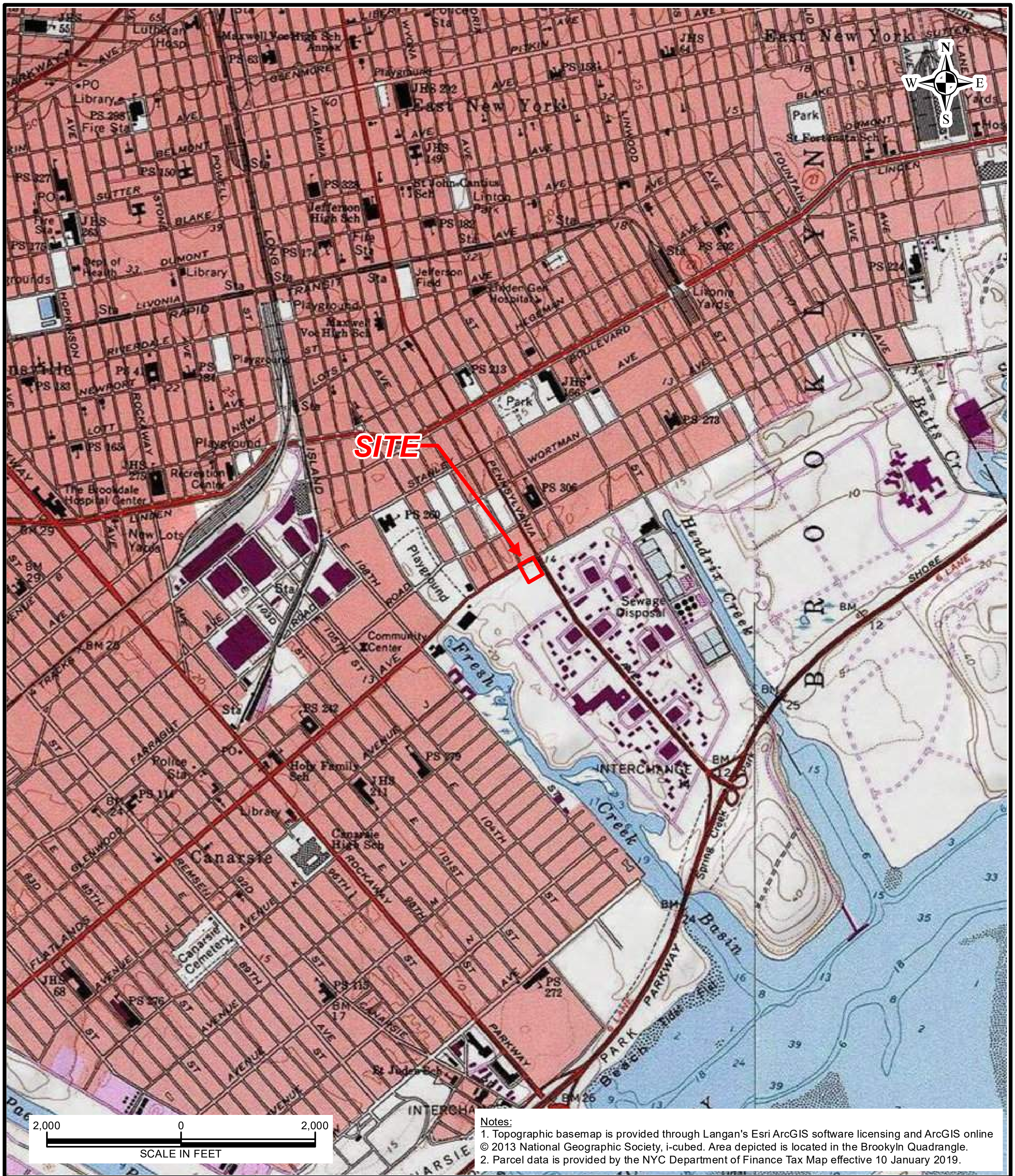
Engineering Fee Assumptions:

-Engineering Item No. 4 - Special inspections as required by the New York City Department of Building.

-Engineering Item No. 5 - The cost assumes collection of 14 samples plus quality assurance/quality control samples. Sample analysis will be for Part 375 VOCs, SVOCs, PCBs, pesticides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane. Fee includes subcontracted laboratory analysis by a NYSDOH ELAP-certified laboratory and ASP Category B deliverables.

-Engineering Item No. 10 - This task will be completed annually until such a time that the Environmental Easement is extinguished.

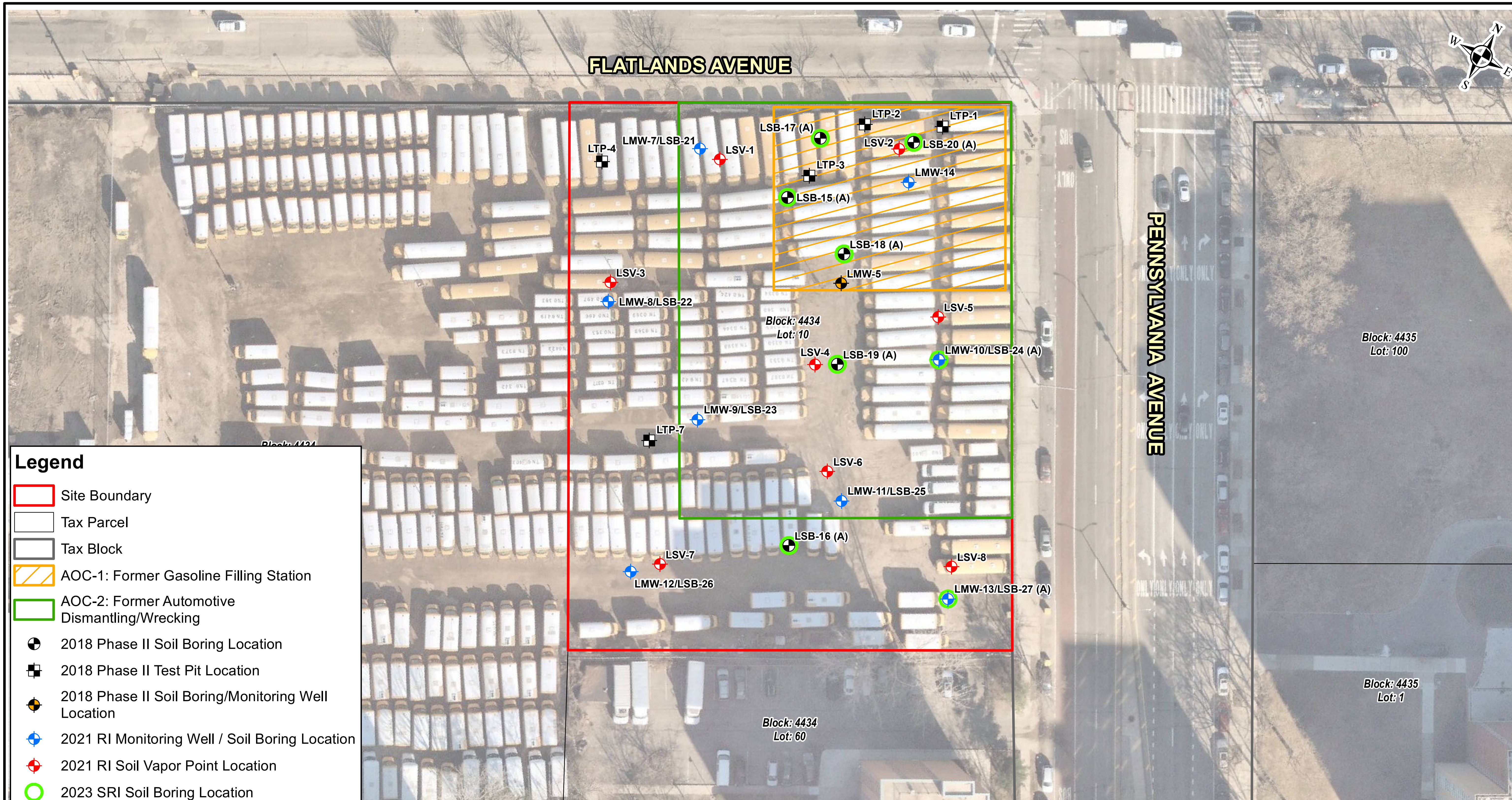
FIGURES



Notes:
1. Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2013 National Geographic Society, i-cubed. Area depicted is located in the Brookyln Quadrangle.
2. Parcel data is provided by the NYC Department of Finance Tax Map effective 10 January 2019.

LANGAN 300 Kimball Drive Parsippany, NJ 07054 T: 973.560.4900 F: 973.560.4901 www.langan.com Langan Engineering & Environmental Services, Inc. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. Langan International LLC Collectively known as Langan NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400	Project 12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	Drawing Title SITE LOCATION MAP	Project No. 100688801 Date 6/21/2021 Scale 1"=2,000' Drawn By JR Last Revised 6/21/2021	Figure 1

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 BCP RIR (Lot 10)\Figure 1 - Site Location Map.mxd Date: 6/21/2021 User: aruane Time: 11:47:43 AM



Notes:
1. Aerial imagery provided by Nearmap ltd., collected March 10, 2021.
2. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.
3. AOC-1 and AOC-2 locations are based on a Sanborn Fire Insurance Map dated 1950.
4. 2018 Phase II EI Sample and Test Pit Locations obtained from Phase II EI Report conducted by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. dated 8/24/2018.
5. Sample locations for the RI were collected for soil borings and monitoring wells using classic survey techniques and for soil vapor points using the ArcGIS Collector application on a tablet utilizing the GPS location.
6. AOC-3: Presence of Historic Fill is identified as site-wide.

50 0 50
SCALE IN FEET

LANGAN

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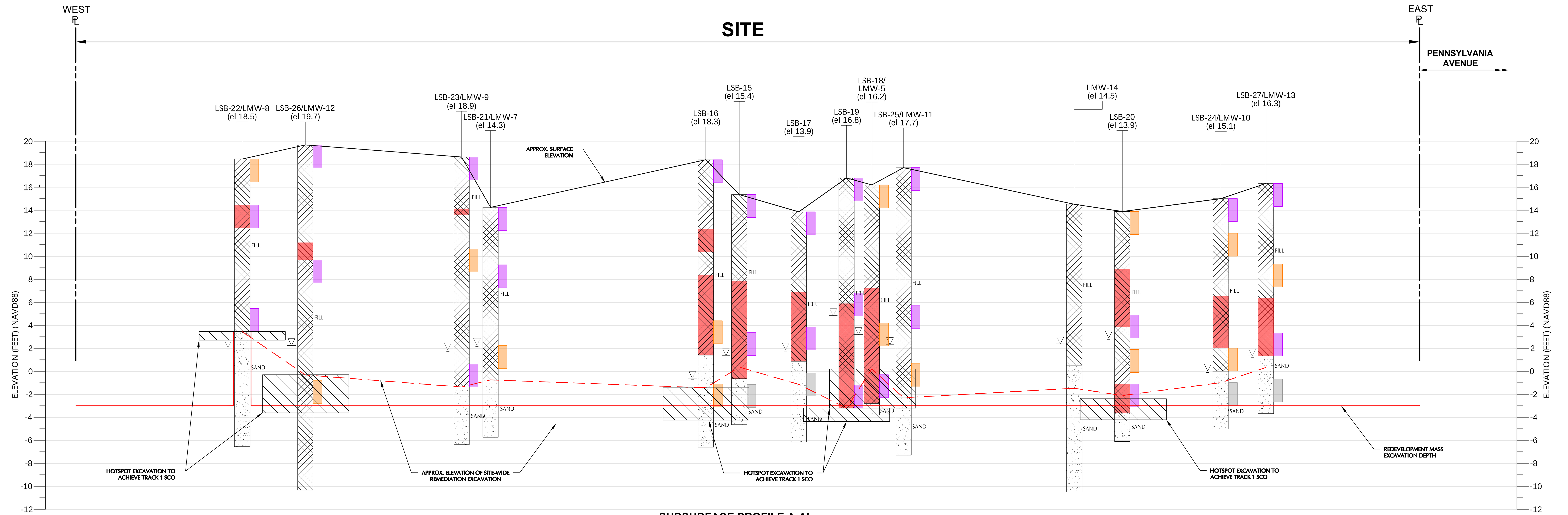
Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

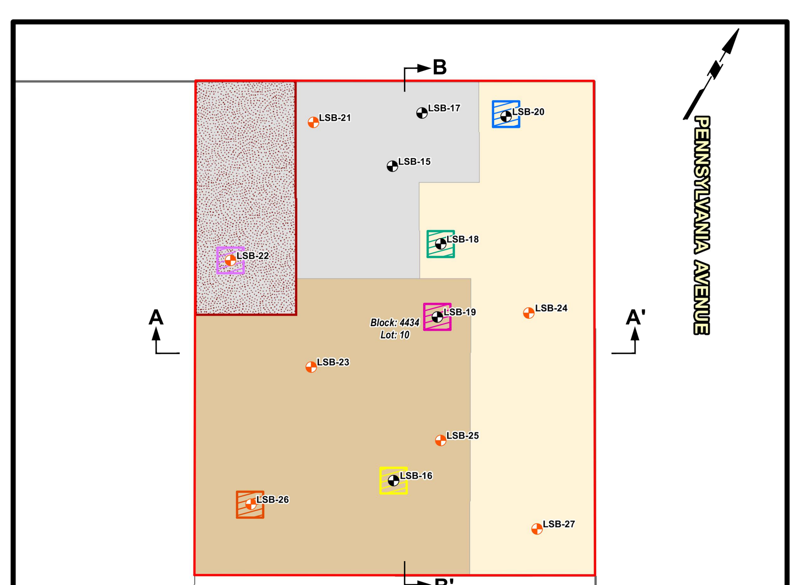
Project	Drawing Title	Project No.	Figure
12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	SITE PLAN	100688801	2
		Date: 9/6/2022	
		Scale: 1 " = 50 '	
		Drawn By: IHB	
		Last Revised: 6/19/2023	

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2023-06 Phase 1A\Figure 2 - Site Plan.mxd Date: 6/19/2023 User: ibaker Time: 2:51:47 PM



SUBSURFACE PROFILE A-A'
VERTICAL SCALE: 1" = 4'
HORIZONTAL SCALE: 1" = 8'

SUBSURFACE PROFILE B-B'
VERTICAL SCALE: 1" = 4'
HORIZONTAL SCALE: 1" = 8'



KEY PLAN N.T.S.

NOTES:

1. THIS PROFILE SHOWS GENERALIZED SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. VARIATIONS IN SUBSURFACE CONDITIONS SHOULD BE EXPECTED BETWEEN BORINGS. FOR A DETAILED DESCRIPTION OF CONDITIONS ENCOUNTERED, SEE BORING LOGS INCLUDED IN APPENDIX B AND APPENDIX H.
2. SOIL BORING LOCATIONS ARE APPROXIMATE. GROUND SURFACE ELEVATIONS FOR LSB-15 THROUGH LSB-20, WITH THE EXCEPTION OF LSB-18, ARE INFERRED FROM LIDAR FILES. GROUND SURFACE ELEVATIONS OF SOIL BORINGS COLLOCATED WITH MONITORING WELLS (LSB-18 AND LSB-21 THROUGH LSB-27) WERE SURVEYED USING GPS LOCATING TECHNIQUES.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988, NAVD88.
4. SOIL BORINGS LSB-15 THROUGH LSB-20 WERE COMPLETED ON 18 MAY 2018 AS PART OF THE 2018 PHASE II INVESTIGATION. LSB-21 THROUGH LSB-27 WERE COMPLETED BETWEEN 13 AND 15 APRIL 2021 AS PART OF THE 2021 REMEDIAL INVESTIGATION.

BORING KEY:

B-X
(el XX±)
MATERIAL (AS SPECIFIED)

LEGEND:

- B-X — DRILLED BORING IDENTIFICATION
- el XX± — APPROXIMATE SURFACE ELEVATION AT THE TIME OF BORING (NAVD88)
- GROUNDWATER IN MONITORING WELL
- ASH LAYER OBSERVED
- APPROX. SURFACE ELEVATION
- 2' SAMPLE INTERVAL HAD EXCEEDANCES OF NYSDEC PART 375 UNRESTRICTED USE SCOs
- APPROXIMATE SURFACE ELEVATION AT THE TIME OF BORING (NAVD88) / 2' SAMPLE INTERVAL HAD EXCEEDANCES OF NYSDEC PART 375 RESTRICTED RESIDENTIAL USE SCOs
- 2' SAMPLE INTERVAL HAD NO EXCEEDANCES OF THE NYSDEC PART 375 UNRESTRICTED USE SCOs
- PROPOSED REMEDIAL EXCAVATION DEPTH
- REDEVELOPMENT MASS EXCAVATION DEPTH
- HOTSPOT EXCAVATION TO ACHIEVE TRACK 1 SCO

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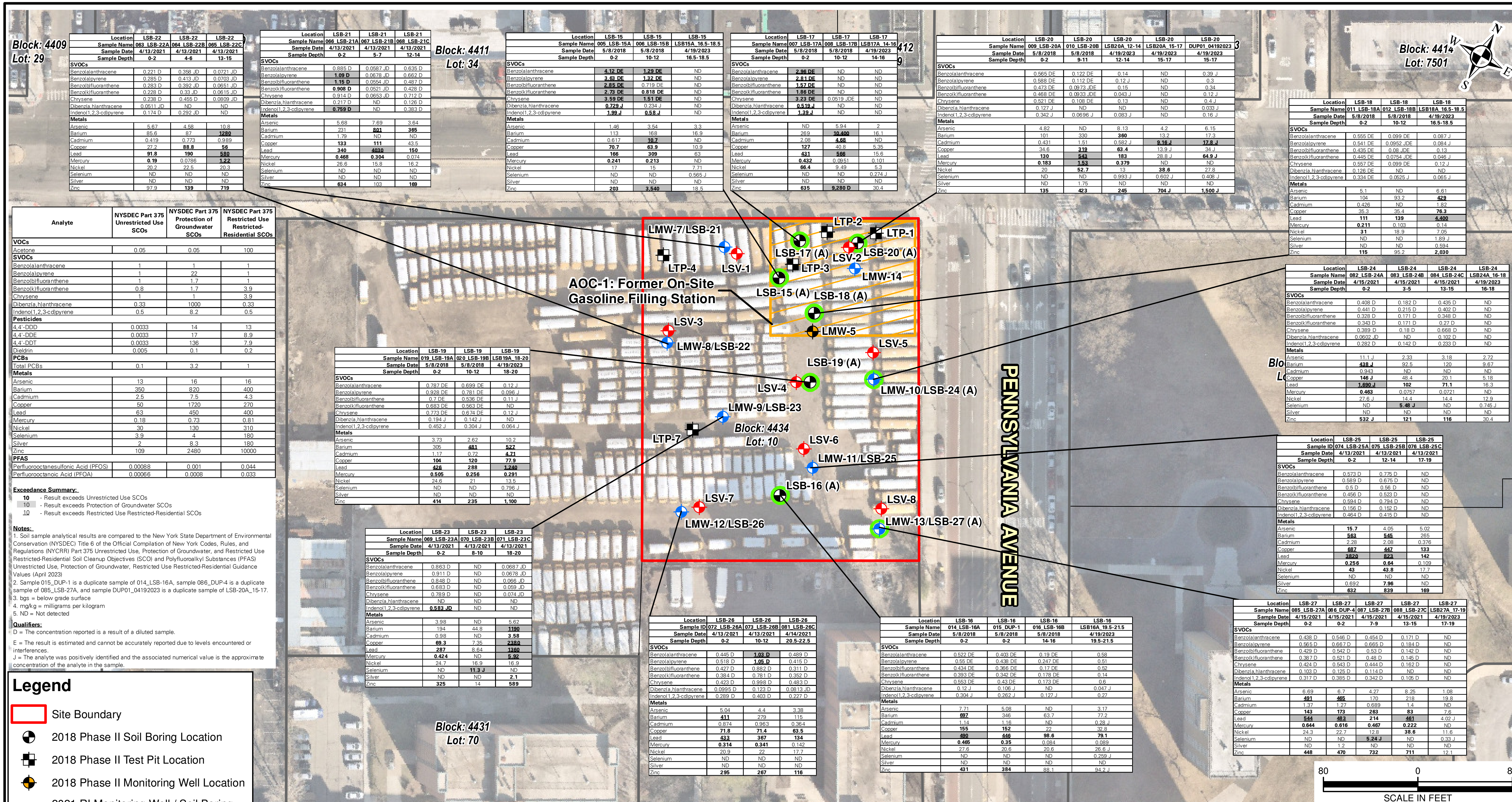
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project	Drawing Title	Project No.	Figure
12074 FLATLANDS AVENUE BLOCK NO. 4434, LOT NO. 10 BROOKLYN KINGS COUNTY NEW YORK	SUBSURFACE PROFILES A-A' & B-B'	100688801 Date 06/19/23 Drawn By AC Checked By BR	3

LANGAN
PROJECT NO. 100688801

Filename: \\langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2022-09 RAWP\Figure 3 - Subsurface Profiles\Figure 3 - Subsurface Profiles A-A B-B.dwg Date: 6/19/2023 Time: 15:35 User: aruane Style Table: Langan.stb Layout: Profiles



Location	LSB-22	LSB-22	LSB-22
Sample Name	063_LSB-22A	064_LSB-22B	065_LSB-22C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	4-6	13-15
SVOCs			
Benzo(a)anthracene	0.221 D	0.358 JD	0.0721 JD
Benzo(a)pyrene	0.285 D	0.413 JD	0.0703 JD
Benzo(b)fluoranthene	0.283 D	0.392 JD	0.0651 JD
Benzo(k)fluoranthene	0.228 D	0.33 JD	0.0615 JD
Chrysene	0.238 D	0.455 D	0.0809 JD
Dibenz(a,h)anthracene	0.0511 JD	ND	ND
Indeno(1,2,3-cd)pyrene	0.174 D	0.292 JD	ND
Metals			
Arsenic	5.67	4.58	10.8
Barium	85.6	87	**1280**
Cadmium	0.419	0.773	0.989
Copper	27.2	**88.8**	**56**
Lead	**91.8**	**190**	**580**
Mercury	**0.19**	0.0786	**1.22**
Nickel	20.2	22.5	20.3
Selenium	ND	ND	ND
Silver	ND	ND	ND
Zinc	97.9	**139**	**719**

Location	LSB-21	LSB-21	LSB-21
Sample Name	066_LSB-21A	067_LSB-21B	068_LSB-21C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	5-7	12-14
SVOCs			
Benzo(a)anthracene	0.885 D	0.0587 JD	0.635 D
Benzo(a)pyrene	**1.09 D**	0.0678 JD	0.662 D
Benzo(b)fluoranthene	**1.15 D**	0.0554 JD	0.487 D
Benzo(k)fluoranthene	**0.908 D**	0.0521 JD	0.428 D
Chrysene	0.914 D	0.0653 JD	0.712 D
Dibenz(a,h)anthracene	0.217 D	ND	0.126 D
Indeno(1,2,3-cd)pyrene	**0.759 D**	ND	0.383 D
Metals			
Arsenic	5.68	7.69	3.64
Barium	231	**801**	**365**
Cadmium	1.79	ND	ND
Copper	**133**	**111**	43.5
Lead	**340**	**4030**	**150**
Mercury	**0.468**	**0.304**	0.074
Nickel	26.6	15.8	16.2
Selenium	ND	ND	ND
Silver	ND	ND	ND
Zinc	**634**	103	**169**

Location	LSB-15	LSB-15	LSB-15
Sample Name	005_LSB-15A	006_LSB-15B	LSB15A_16.5-18.5
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	16.5-18.5
SVOCs			
Benzo(a)anthracene	**4.12 DE**	**1.29 DE**	ND
Benzo(a)pyrene	**3.63 DE**	**1.32 DE**	ND
Benzo(b)fluoranthene	**2.85 DE**	0.719 DE	ND
Benzo(k)fluoranthene	**2.73 DE**	**0.818 DE**	ND
Chrysene	**3.59 DE**	**1.51 DE**	ND
Dibenz(a,h)anthracene	**0.729 J**	0.234 J	ND
Indeno(1,2,3-cd)pyrene	**1.99 J**	**0.58 J**	ND
Metals			
Arsenic	1.46	3.54	3.3
Barium	113	168	16.9
Cadmium	0.617	**10.7**	ND
Copper	**70.7**	**63.9**	10.9
Lead	**166**	**309**	63
Mercury	**0.241**	**0.213**	ND
Nickel	17	15	7.71
Selenium	ND	ND	0.565 J
Silver	ND	ND	ND
Zinc	**203**	**3,540**	18.5

Location	LSB-17	LSB-17	LSB-17
Sample Name	007_LSB-17A	008_LSB-17B	LSB17A_14-16
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	14-16
SVOCs			
Benzo(a)anthracene	**2.96 DE**	ND	ND
Benzo(a)pyrene	**2.81 DE**	ND	ND
Benzo(b)fluoranthene	**1.57 DE**	ND	ND
Benzo(k)fluoranthene	**1.86 DE**	ND	ND
Chrysene	**3.23 DE**	0.0519 JDE	ND
Dibenz(a,h)anthracene	**0.519 J**	ND	ND
Indeno(1,2,3-cd)pyrene	**1.39 J**	ND	ND
Metals			
Arsenic	ND	5.94	2
Barium	269	**10,400**	16.1
Cadmium	2.08	**4.68**	ND
Copper	**127**	40.8	5.35
Lead	**431**	**566**	15.6
Mercury	**0.432**	0.0951	0.101
Nickel	**66.4**	9.49	5.3
Selenium	ND	ND	0.274 J
Silver	ND	ND	ND
Zinc	**635**	**9,280 D**	30.4

Location	LSB-20	LSB-20	LSB-20	LSB-20	LSB-20
Sample Name	009_LSB-20A	010_LSB-20B	LSB20A_12-14	LSB20A_15-17	DUP01_04192023
Sample Date	5/8/2018	5/8/2018	4/19/2023	4/19/2023	4/19/2023
Sample Depth	0-2	9-11	12-14	15-17	15-17
SVOCs					
Benzo(a)anthracene	0.565 DE	0.122 DE	0.14	ND	0.39 J
Benzo(a)pyrene	0.588 DE	0.112 DE	0.12 J	ND	0.3
Benzo(b)fluoranthene	0.473 DE	0.0973 JDE	0.15	ND	0.34
Benzo(k)fluoranthene	0.468 DE	0.0933 JDE	0.043 J	ND	0.12 J
Chrysene	0.521 DE	0.108 DE	0.13	ND	0.4 J
Dibenz(a,h)anthracene	0.127 J	ND	ND	ND	0.033 J
Indeno(1,2,3-cd)pyrene	0.342 J	0.0696 J	0.083 J	ND	0.16 J
Metals					
Arsenic	4.82	ND	8.13	4.2	6.15
Barium	101	330	**360**	13.2	17.3
Cadmium	0.431	1.51	0.582 J	**9.16 J**	**17.8 J**
Copper	34.6	**319**	**63.4**	13.9 J	34 J
Lead	**130**	**543**	**183**	28.8 J	**64.9 J**
Mercury	**0.183**	**1.53**	**0.379**	ND	ND
Nickel	20	**52.7**	13	**38.6**	27.8
Selenium	ND	ND	0.993 J	0.602 J	0.408 J
Silver	ND	1.75	ND	ND	ND
Zinc	**135**	**423**	**245**	**704 J**	**1,500 J**

Location	LSB-18	LSB-18	LSB-18
Sample Name	011_LSB-18A	012_LSB-18B	LSB18A_16.5-18.5
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	16.5-18.5
SVOCs			
Benzo(a)anthracene	0.555 DE	0.099 DE	0.087 J
Benzo(a)pyrene	0.541 DE	0.0952 JDE	0.084 J
Benzo(b)fluoranthene	0.435 DE	0.08 JDE	0.13
Benzo(k)fluoranthene	0.445 DE	0.0754 JDE	0.046 J
Chrysene	0.557 DE	0.099 DE	0.12 J
Dibenz(a,h)anthracene	0.126 DE	ND	ND
Indeno(1,2,3-cd)pyrene	0.334 DE	0.0525 J	0.065 J
Metals			
Arsenic	5.1	ND	6.61
Barium	104	93.2	**429**
Cadmium	0.426	ND	1.82
Copper	35.3	35.4	**76.3**
Lead	**111**	**139**	**4,400**
Mercury	**0.211**	0.103	0.14
Nickel	**31**	18.9	7.05
Selenium	ND	ND	1.89 J
Silver	ND	ND	0.594
Zinc	**115**	95.2	**2,030**

Location	LSB-24	LSB-24	LSB-24	LSB-24
Sample Name	082_LSB-24A	083_LSB-24B	084_LSB-24C	LSB24A_16-18
Sample Date	4/15/2021	4/15/2021	4/15/2021	4/19/2023
Sample Depth	0-2	3-5	13-15	16-18
SVOCs				
Benzo(a)anthracene	0.408 D	0.182 D	0.435 D	ND
Benzo(a)pyrene	0.441 D	0.215 D	0.402 D	ND
Benzo(b)fluoranthene	0.328 D	0.171 D	0.348 D	ND
Benzo(k)fluoranthene	0.343 D	0.171 D	0.27 D	ND
Chrysene	0.389 D	0.18 D	0.668 D	ND
Dibenz(a,h)anthracene	0.0602 JD	ND	0.102 D	ND
Indeno(1,2,3-cd)pyrene	0.282 D	0.142 D	0.233 D	ND
Metals				
Arsenic	11.1 J	2.33	3.18	2.72
Barium	**438 J**	92.5	120	9.67
Cadmium	0.943	ND	ND	ND
Copper	**146 J**	48.4	20.1	5.18
Lead	**1,690 J**	**102**	**71.1**	16.3
Mercury	**0.463**	0.0757	0.0721	ND
Nickel	27.6 J	14.4	14.4	12.9
Selenium	ND	**5.48 J**	ND	0.745 J
Silver	ND	ND	ND	ND
Zinc	**532 J**	**121**	**116**	30.4

Location	LSB-19	LSB-19	LSB-19
Sample Name	019_LSB-19A	020_LSB-19B	LSB19A_18-20
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	18-20
SVOCs			
Benzo(a)anthracene	0.787 DE	0.699 DE	0.12 J
Benzo(a)pyrene	0.928 DE	0.781 DE	0.096 J
Benzo(b)fluoranthene	0.7 DE	0.536 DE	0.11 J
Benzo(k)fluoranthene	0.683 DE	0.563 DE	ND
Chrysene	0.773 DE	0.674 DE	0.12 J
Dibenz(a,h)anthracene	0.194 J	0.142 J	ND
Indeno(1,2,3-cd)pyrene	0.452 J	0.304 J	0.064 J
Metals			
Arsenic	3.73	2.62	10.2
Barium	305	**481**	**527**
Cadmium	1.17	0.72	**4.71**
Copper	**104**	**120**	**77.9**
Lead	**426**	**288**	**1,240**
Mercury	**0.505**	**0.256**	**0.291**
Nickel	24.6	21	13.5
Selenium	ND	ND	0.796 J
Silver	ND	ND	ND
Zinc	**414**	**235**	**1,100**

Location	LSB-25	LSB-25	LSB-25
Sample ID	074_LSB-25A	075_LSB-25B	076_LSB-25C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	12-14	17-19
SVOCs			
Benzo(a)anthracene	0.573 D	0.775 D	ND
Benzo(a)pyrene	0.589 D	0.675 D	ND
Benzo(b)fluoranthene	0.5 D	0.56 D	ND
Benzo(k)fluoranthene	0.456 D	0.523 D	ND
Chrysene	0.594 D	0.794 D	ND
Dibenz(a,h)anthracene	0.156 D	0.152 D	ND
Indeno(1,2,3-cd)pyrene	0.464 D	0.415 D	ND
Metals			
Arsenic	**15.7**	4.05	5.02
Barium	**563**	**545**	265
Cadmium	2.28	2.08	0.376
Copper	**687**	**447**	**133**
Lead	**3820**	**823**	**142**
Mercury	**0.256**	**0.64**	0.109
Nickel	**43**	**43.8**	17.7
Selenium	ND	ND	ND
Silver	0.692	**7.96**	ND
Zinc	**632**	**839**	**169**

Location	LSB-23	LSB-23	LSB-23
Sample Name	069_LSB-23A	070_LSB-23B	071_LSB-23C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	8-10	18-20
SVOCs			
Benzo(a)anthracene	0.863 D	ND	0.0687 JD
Benzo(a)pyrene	0.911 D	ND	0.0678 JD
Benzo(b)fluoranthene	0.848 D	ND	0.066 JD
Benzo(k)fluoranthene	0.683 D	ND	0.059 JD
Chrysene	0.789 D	ND	0.074 JD
Dibenz(a,h)anthracene	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**0.583 JD**	ND	ND
Metals			
Arsenic	3.98	ND	5.62
Barium	194	44.8	**1190**
Cadmium	0.98	ND	**3.58**
Copper	**69.3**	7.35	**2380**
Lead	**287**	8.64	**1360**
Mercury	**0.424**	ND	**5.92**
Nickel	24.7	16.9	16.9
Selenium	ND	**11.3 J**	ND
Silver	ND	ND	**2.1**
Zinc	**325**	14	**589**

Location	LSB-26	LSB-26	LSB-26
Sample ID	072_LSB-26A	073_LSB-26B	081_LSB-26C
Sample Date	4/13/2021	4/13/2021	4/14/2021
Sample Depth	0-2	10-12	20.5-22.5
SVOCs			
Benzo(a)anthracene	0.445 D	**1.03 D**	0.489 D
Benzo(a)pyrene	0.518 D	**1.05 D**	0.415 D
Benzo(b)fluoranthene	0.427 D	0.882 D	0.311 D
Benzo(k)fluoranthene	0.384 D	0.781 D	0.352 D
Chrysene	0.423 D	0.998 D	0.483 D
Dibenz(a,h)anthracene	0.0995 D	0.123 D	0.0813 JD
Indeno(1,2,3-cd)pyrene	0.289 D	0.403 D	0.227 D
Metals			
Arsenic	5.04	4.4	3.38
Barium	**411**	279	115
Cadmium	0.874	0.963	0.364
Copper	**71.8**	**71.4**	**63.5**
Lead	**433**	**367**	**134**
Mercury	**0.314**	**0.341**	0.142
Nickel	20.9	22	17.7
Selenium	ND	ND	ND
Silver	ND	ND	ND
Zinc	**295**	**267**	**116**

Location	LSB-16	LSB-16	LSB-16	LSB-16
Sample Name	014_LSB-16A	015_DUP-1	016_LSB-16B	LSB16A_19.5-21.5
Sample Date	5/8/2018	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	0-2	14-16	19.5-21.5
SVOCs				
Benzo(a)anthracene	0.522 DE	0.403 DE	0.19 DE	0.58
Benzo(a)pyrene	0.55 DE	0.438 DE	0.247 DE	0.51
Benzo(b)fluoranthene	0.434 DE	0.366 DE	0.17 DE	0.52
Benzo(k)fluoranthene	0.393 DE	0.342 DE	0.178 DE	0.14
Chrysene	0.553 DE	0.43 DE	0.173 DE	0.6
Dibenz(a,h)anthracene	0.12 J	0.106 J	ND	0.047 J
Indeno(1,2,3-cd)pyrene	0.304 J	0.262 J	0.127 J	0.27
Metals				
Arsenic	7.71	5.08	ND	3.17
Barium	**697**	346	63.7	77.2
Cadmium	1.14	1.16	ND	0.28 J
Copper	**155**	**152**	22	32.8
Lead	**490**	**446**	**98.6**	**79.1**
Mercury	**0.465**	**0.35**	0.084	0.089
Nickel	27.6	20.6	20.6	26.6 J
Selenium	ND	ND	ND	0.259 J
Silver	ND	ND	ND	ND
Zinc	**431**	**384**	88.1	94.2 J

Location	LSB-27	LSB-27	LSB-27	LSB-27	LSB-27
Sample Name	085_LSB-27A	086_DUP-4	087_LSB-27B	088_LSB-27C	LSB27A_17-19
Sample Date	4/15/2021	4/15/2021	4/15/2021	4/15/2021	4/19/2023
Sample Depth	0-2	0-2	7-9	13-15	17-19
SVOCs					
Benzo(a)anthracene	0.438 D	0.546 D	0.454 D	0.171 D	ND
Benzo(a)pyrene	0.565 D	0.667 D	0.665 D	0.184 D	ND
Benzo(b)fluoranthene	0.429 D	0.542 D	0.53 D	0.142 D	ND
Benzo(k)fluoranthene	0.387 D	0.521 D	0.48 D	0.145 D	ND
Chrysene	0.424 D	0.543 D	0.444 D	0.162 D	ND
Dibenz(a,h)anthracene	0.103 D	0.125 D	0.114 D	ND	ND
Indeno(1,2,3-cd)pyrene	0.317 D	0.385 D	0.342 D	0.105 D	ND
Metals					
Arsenic	6.69	6.7	4.27	8.25	1.08
Barium	**491**	**465**	170	218	19.8
Cadmium	1.37	1.27	0.689	1.4	ND
Copper	**143**	**173**	**263**	**83**	7.6
Lead	**544**	**483**	**214**	**461**	4.02 J
Mercury	**0.644**	**0.616**	**0.467**	**0.222**	ND
Nickel	24.3	22.7	12.8	**38.6**	11.6
Selenium	ND	ND	**5.24 J**	ND	0.33 J
Silver	ND	1.2	ND	ND	ND
Zinc	**448**	**470**	**732**	**711**	12.1

Analyte	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs
VOCs			
Acetone	0.05	0.05	100
SVOCs			
Benzo(a)anthracene	1	1	1
Benzo(a)pyrene	1	22	1
Benzo(b)fluoranthene	1	1.7	1
Benzo(k)fluoranthene	0.8	1.7	3.9
Chrysene	1	1	3.9
Dibenz(a,h)anthracene	0.33	1000	0.33
Indeno(1,2,3-cd)pyrene	0.5	8.2	0.5
Pesticides			
4,4'-DDD	0.0033	14	13
4,4'-DDE	0.0033	17	8.9
4,4'-DDT	0.0033	136	7.9
Dieldrin	0.005	0.1	0.2
PCBs			
Total PCBs	0.1	3.2	1
Metals			
Arsenic	13	16	16
Barium	350	820	400
Cadmium	2.5	7.5	4.3
Copper	50	1720	270
Lead	63	450	400
Mercury	0.18	0.73	0.81
Nickel	30	130	310
Selenium	3.9	4	180
Silver	2	8.3	180
Zinc	109	2480	10000
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	0.00088	0.001	0.044
Perfluorooctanoic Acid (PFOA)	0.00066	0.0008	0.033

Exceedance Summary:

10 - Result exceeds Unrestricted Use SCOs
10 - Result exceeds Protection of Groundwater SCOs
10 - Result exceeds Restricted Use Restricted-Residential SCOs

Notes:
1. 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, Protection of Groundwater, and Restricted Use Restricted-Residential Soil Cleanup Objectives (SCO) and Polyfluoroalkyl Substances (PFAS) Unrestricted Use, Protection of Groundwater, Restricted Use Restricted-Residential Guidance Values (April 2023)
2. Sample 015_DUP-1 is a duplicate sample of 014_LSB-16A, sample 086_DUP-4 is a duplicate sample of 085_LSB-27A, and sample DUP01_04192023 is a duplicate sample of LSB-20A_15-17.
3. bgs = below grade surface
4. mg/kg = milligrams per kilogram
5. ND = Not detected

Qualifiers:
D = The concentration reported is a result of a diluted sample.
E = The result is estimated and cannot be accurately reported due to levels encountered or interferences.
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

Legend

- Site Boundary
- 2018 Phase II Soil Boring Location
- 2018 Phase II Test Pit Location
- 2018 Phase II Monitoring Well Location
- 2021 RI Monitoring Well / Soil Boring Location
- 2021 RI Soil Vapor Point Location
- 2023 SRI Soil Boring Location
- Tax Parcel
- Tax Block
- AOC-1

Notes:
1. Aerial imagery provided by Nearmap ltd., collected March 10, 2021.
2. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.
3. AOC-1 location is based on a Sanborn Fire Insurance Map dated 1950.
4. 2018 Phase II EI Sample and Test Pit Locations obtained from Phase II EI Report conducted by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. dated 8/24/2018.
5. Sample locations for the RI were collected for soil borings and monitoring wells using classic survey techniques and for soil vapor points using the ArcGIS Collector application on a tablet utilizing the GPS location.

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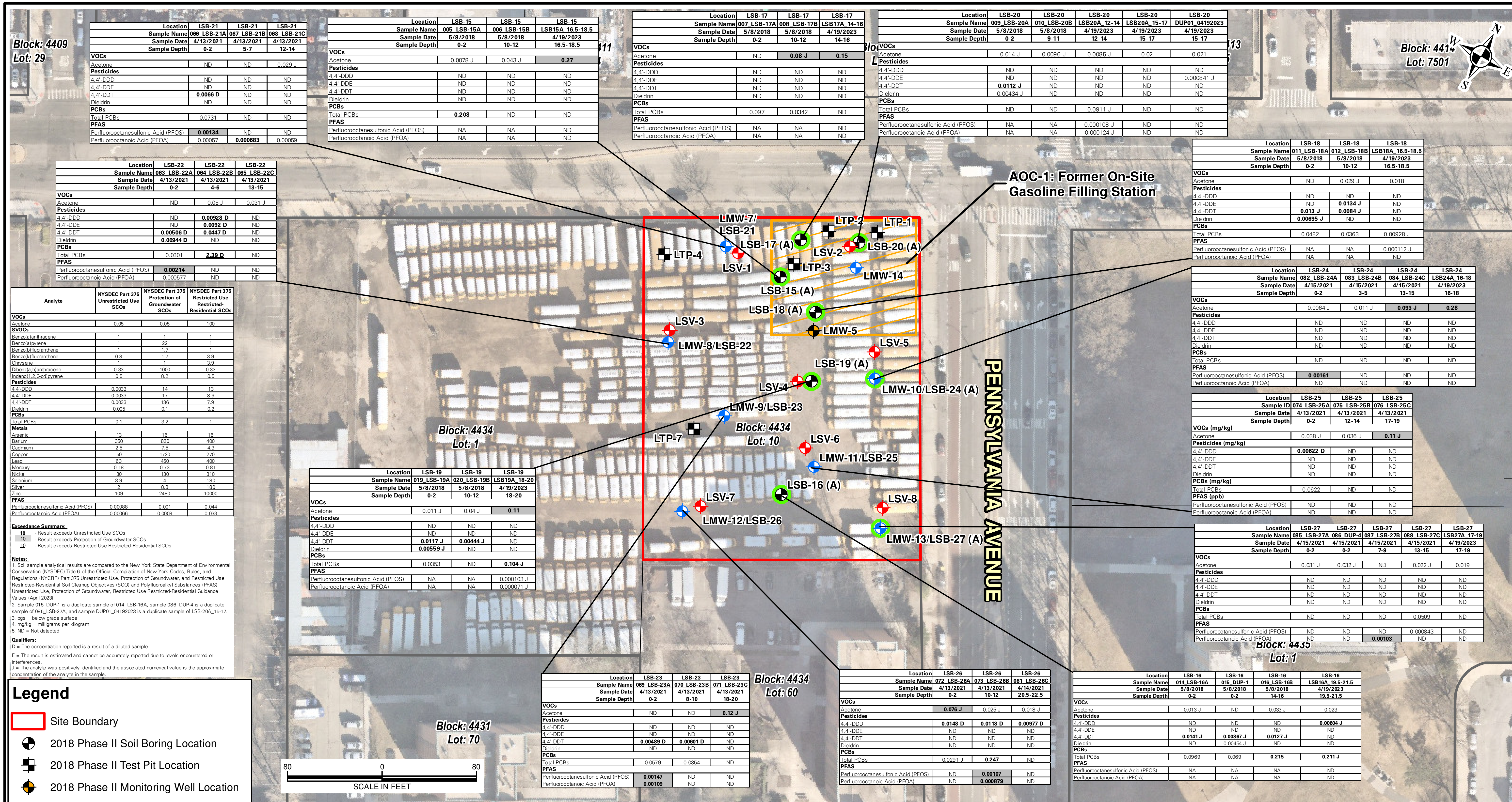
Collectively known as Langan
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project	Drawing Title	Project No.	Figure
12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	2018 PHASE II EI, 2021 RI, AND 2023 SRI SOIL ANALYTICAL RESULTS - SVOCS AND METAL	100688801 Date: 6/21/2021 Scale: 1 " = 80 ' Drawn By: ATR Last Revised: 6/16/2023	4A

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 BCP RIR (Lot 10)\Figure 5A - Phase II EI and RI Soil Analytical Results - SVOCs and Metals.mxd Date: 6/16/2023 User: ibaker Time: 4:18:33 PM



Location	LSB-21	LSB-21	LSB-21
Sample Name	066_LSB-21A	067_LSB-21B	068_LSB-21C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	5-7	12-14
VOCs			
Acetone	ND	ND	0.029 J
Pesticides			
4,4'-DDD	ND	ND	ND
4,4'-DDE	ND	ND	ND
4,4'-DDT	**0.0066 D**	ND	ND
Dieldrin	ND	ND	ND
PCBs			
Total PCBs	0.0731	ND	ND
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	**0.00134**	ND	ND
Perfluorooctanoic Acid (PFOA)	0.00057	**0.000683**	0.00059

Location	LSB-15	LSB-15	LSB-15
Sample Name	005_LSB-15A	006_LSB-15B	LSB15A_16.5-18.5
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	16.5-18.5
VOCs			
Acetone	0.0078 J	0.043 J	**0.27**
Pesticides			
4,4'-DDD	ND	ND	ND
4,4'-DDE	ND	ND	ND
4,4'-DDT	ND	ND	ND
Dieldrin	ND	ND	ND
PCBs			
Total PCBs	**0.208**	ND	ND
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	NA	NA	ND
Perfluorooctanoic Acid (PFOA)	NA	NA	ND

Location	LSB-17	LSB-17	LSB-17
Sample Name	007_LSB-17A	008_LSB-17B	LSB17A_14-16
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	14-16
VOCs			
Acetone	ND	**0.08 J**	**0.15**
Pesticides			
4,4'-DDD	ND	ND	ND
4,4'-DDE	ND	ND	ND
4,4'-DDT	ND	ND	ND
Dieldrin	ND	ND	ND
PCBs			
Total PCBs	0.097	0.0342	ND
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	NA	NA	ND
Perfluorooctanoic Acid (PFOA)	NA	NA	ND

Location	LSB-20	LSB-20	LSB-20	LSB-20	LSB-20
Sample Name	009_LSB-20A	010_LSB-20B	LSB20A_12-14	LSB20A_15-17	DUP01_04192023
Sample Date	5/8/2018	5/8/2018	4/19/2023	4/19/2023	4/19/2023
Sample Depth	0-2	9-11	12-14	15-17	15-17
VOCs					
Acetone	0.014 J	0.0096 J	0.0085 J	0.02	0.021
Pesticides					
4,4'-DDD	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	0.000841 J
4,4'-DDT	**0.0112 J**	ND	ND	ND	ND
Dieldrin	0.00434 J	ND	ND	ND	ND
PCBs					
Total PCBs	ND	ND	0.0911 J	ND	ND
PFAS					
Perfluorooctanesulfonic Acid (PFOS)	NA	NA	0.000108 J	ND	ND
Perfluorooctanoic Acid (PFOA)	NA	NA	0.000124 J	ND	ND

Location	LSB-22	LSB-22	LSB-22
Sample Name	063_LSB-22A	064_LSB-22B	065_LSB-22C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	4-6	13-15
VOCs			
Acetone	ND	0.05 J	0.031 J
Pesticides			
4,4'-DDD	ND	**0.00928 D**	ND
4,4'-DDE	ND	**0.0092 D**	ND
4,4'-DDT	**0.00506 D**	**0.0447 D**	ND
Dieldrin	**0.00944 D**	ND	ND
PCBs			
Total PCBs	0.0301	**2.39 D**	ND
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	**0.00214**	ND	ND
Perfluorooctanoic Acid (PFOA)	0.000577	ND	ND

Location	LSB-18	LSB-18	LSB-18
Sample Name	011_LSB-18A	012_LSB-18B	LSB18A_16.5-18.5
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	16.5-18.5
VOCs			
Acetone	ND	0.029 J	0.018
Pesticides			
4,4'-DDD	ND	ND	ND
4,4'-DDE	ND	**0.0134 J**	ND
4,4'-DDT	**0.013 J**	**0.0084 J**	ND
Dieldrin	**0.00695 J**	ND	ND
PCBs			
Total PCBs	0.0482	0.0363	0.00928 J
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	NA	NA	0.000112 J
Perfluorooctanoic Acid (PFOA)	NA	NA	ND

Location	LSB-24	LSB-24	LSB-24	LSB-24
Sample Name	082_LSB-24A	083_LSB-24B	084_LSB-24C	LSB24A_16-18
Sample Date	4/15/2021	4/15/2021	4/15/2021	4/19/2023
Sample Depth	0-2	3-5	13-15	16-18
VOCs				
Acetone	0.0064 J	0.011 J	**0.093 J**	**0.28**
Pesticides				
4,4'-DDD	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND
PCBs				
Total PCBs	ND	ND	ND	ND
PFAS				
Perfluorooctanesulfonic Acid (PFOS)	**0.00161**	ND	ND	ND
Perfluorooctanoic Acid (PFOA)	ND	ND	ND	ND

Location	LSB-25	LSB-25	LSB-25
Sample ID	074_LSB-25A	075_LSB-25B	076_LSB-25C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	12-14	17-19
VOCs (mg/kg)			
Acetone	0.038 J	0.036 J	**0.11 J**
Pesticides (mg/kg)			
4,4'-DDD	**0.00622 D**	ND	ND
4,4'-DDE	ND	ND	ND
4,4'-DDT	ND	ND	ND
Dieldrin	ND	ND	ND
PCBs (mg/kg)			
Total PCBs	0.0622	ND	ND
PFAS (ppb)			
Perfluorooctanesulfonic Acid (PFOS)	ND	ND	ND
Perfluorooctanoic Acid (PFOA)	ND	ND	ND

Location	LSB-27	LSB-27	LSB-27	LSB-27	LSB-27
Sample Name	085_LSB-27A	086_DUP-4	087_LSB-27B	088_LSB-27C	LSB27A_17-19
Sample Date	4/15/2021	4/15/2021	4/15/2021	4/15/2021	4/19/2023
Sample Depth	0-2	0-2	7-9	13-15	17-19
VOCs					
Acetone	0.031 J	0.032 J	ND	0.022 J	0.019
Pesticides					
4,4'-DDD	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND
PCBs					
Total PCBs	ND	ND	ND	0.0509	ND
PFAS					
Perfluorooctanesulfonic Acid (PFOS)	ND	ND	ND	0.000843	ND
Perfluorooctanoic Acid (PFOA)	ND	ND	**0.00103**	ND	ND

Location	LSB-19	LSB-19	LSB-19
Sample Name	019_LSB-19A	020_LSB-19B	LSB19A_18-20
Sample Date	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	10-12	18-20
VOCs			
Acetone	0.011 J	0.04 J	**0.11**
Pesticides			
4,4'-DDD	ND	ND	ND
4,4'-DDE	ND	ND	ND
4,4'-DDT	**0.0117 J**	**0.00444 J**	ND
Dieldrin	**0.00559 J**	ND	ND
PCBs			
Total PCBs	0.0353	ND	**0.104 J**
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	NA	NA	0.000103 J
Perfluorooctanoic Acid (PFOA)	NA	NA	0.000071 J

Location	LSB-23	LSB-23	LSB-23
Sample Name	069_LSB-23A	070_LSB-23B	071_LSB-23C
Sample Date	4/13/2021	4/13/2021	4/13/2021
Sample Depth	0-2	8-10	18-20
VOCs			
Acetone	ND	ND	**0.12 J**
Pesticides			
4,4'-DDD	ND	ND	ND
4,4'-DDE	ND	ND	ND
4,4'-DDT	**0.00489 D**	**0.00601 D**	ND
Dieldrin	ND	ND	ND
PCBs			
Total PCBs	0.0579	0.0354	ND
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	**0.00147**	ND	ND
Perfluorooctanoic Acid (PFOA)	**0.00109**	ND	ND

Location	LSB-26	LSB-26	LSB-26
Sample Name	072_LSB-26A	073_LSB-26B	081_LSB-26C
Sample Date	4/13/2021	4/13/2021	4/14/2021
Sample Depth	0-2	10-12	20.5-22.5
VOCs			
Acetone	**0.076 J**	0.025 J	0.018 J
Pesticides			
4,4'-DDD	**0.0148 D**	**0.0118 D**	**0.00977 D**
4,4'-DDE	ND	ND	ND
4,4'-DDT	ND	ND	ND
Dieldrin	ND	ND	ND
PCBs			
Total PCBs	0.0291 J	**0.247**	ND
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	ND	**0.00107**	ND
Perfluorooctanoic Acid (PFOA)	ND	**0.000879**	ND

Location	LSB-16	LSB-16	LSB-16	LSB-16
Sample Name	014_LSB-16A	015_DUP-1	016_LSB-16B	LSB16A_19.5-21.5
Sample Date	5/8/2018	5/8/2018	5/8/2018	4/19/2023
Sample Depth	0-2	0-2	14-16	19.5-21.5
VOCs				
Acetone	0.013 J	ND	0.033 J	0.023
Pesticides				
4,4'-DDD	ND	ND	ND	**0.00604 J**
4,4'-DDE	ND	ND	ND	ND
4,4'-DDT	**0.0141 J**	**0.00867 J**	**0.0127 J**	ND
Dieldrin	ND	0.00454 J	ND	ND
PCBs				
Total PCBs	0.0969	0.069	**0.215**	**0.211 J**
PFAS				
Perfluorooctanesulfonic Acid (PFOS)	NA	NA	NA	ND
Perfluorooctanoic Acid (PFOA)	NA	NA	NA	ND

Analyte	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Protection of Groundwater SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs
VOCs			
Acetone	0.05	0.05	100
SVOCs			
Benzo(a)anthracene	1	1	1
Benzo(a)pyrene	1	22	1
Benzo(b)fluoranthene	1	1.7	1
Benzo(k)fluoranthene	0.8	1.7	3.9
Chrysene	1	1	3.9
Dibenz(a,h)anthracene	0.33	1000	0.33
Indeno(1,2,3-cd)pyrene	0.5	8.2	0.5
Pesticides			
4,4'-DDD	0.0033	14	13
4,4'-DDE	0.0033	17	8.9
4,4'-DDT	0.0033	136	7.9
Dieldrin	0.005	0.1	0.2
PCBs			
Total PCBs	0.1	3.2	1
Metals			
Arsenic	13	16	16
Barium	350	820	400
Cadmium	2.5	7.5	4.3
Copper	50	1720	270
Lead	63	450	400
Mercury	0.18	0.73	0.81
Nickel	30	130	310
Selenium	3.9	4	180
Silver	2	8.3	180
Zinc	109	2480	10000
PFAS			
Perfluorooctanesulfonic Acid (PFOS)	0.00088	0.001	0.044
Perfluorooctanoic Acid (PFOA)	0.00066	0.0008	0.033

Exceedance Summary:

10 - Result exceeds Unrestricted Use SCOs
10 - Result exceeds Protection of Groundwater SCOs
10 - Result exceeds Restricted Use Restricted-Residential SCOs

Notes:

1. 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, Protection of Groundwater, and Restricted Use Restricted-Residential Soil Cleanup Objectives (SCO) and Polyfluoroalkyl Substances (PFAS) Unrestricted Use, Protection of Groundwater, Restricted Use Restricted-Residential Guidance Values (April 2023)
2. Sample 015_DUP-1 is a duplicate sample of 014_LSB-16A, sample 086_DUP-4 is a duplicate sample of 085_LSB-27A, and sample DUP01_04192023 is a duplicate sample of LSB-20A_15-17.
3. bgs = below grade surface
4. mg/kg = milligrams per kilogram
5. ND = Not detected

Qualifiers:

D = The concentration reported is a result of a diluted sample.

E = The result is estimated and cannot be accurately reported due to levels encountered or interferences.

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

Legend

- Site Boundary
- 2018 Phase II Soil Boring Location
- 2018 Phase II Test Pit Location
- 2018 Phase II Monitoring Well Location
- 2021 RI Monitoring Well / Soil Boring Location
- 2021 RI Soil Vapor Point Location
- 2023 SRI Soil Boring Location
- Tax Parcel
- Tax Block
- AOC-1

Notes:
1. Aerial imagery provided by Nearmap ltd., collected March 10, 2021.
2. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.
3. AOC-1 location is based on a Sanborn Fire Insurance Map dated 1950.
4. 2018 Phase II EI Sample and Test Pit Locations obtained from Phase II EI Report conducted by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. dated 8/24/2018.
5. Sample locations for the RI were collected for soil borings and monitoring wells using classic survey techniques and for soil vapor points using the ArcGIS Collector application on a tablet utilizing the GPS location.

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Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
12096 FLATLANDS AVENUE
BLOCK No. 4434, LOT No. 10
BROOKLYN
KINGS COUNTY NEW YORK

Drawing Title
2018 PHASE II EI, 2021 RI, AND 2023 SRI SOIL ANALYTICAL RESULTS - VOCS, PESTICIDES, PCBS, AND PFAS

Project No.
100688801
Date
6/21/2021
Scale
1 " = 80 '
Drawn By
ATR
Last Revised
6/16/2023

Figure
4B

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 BCP RIR (Lot 10)\Archive\Figure 5B - Phase II EI and RI Soil Analytical Results - VOCs, Pesticides, Herbicides, PCBs, and PFAs.mxd Date: 6/16/2023 User: ibaker Time: 4:23:20 PM

Sample ID	101_LMW-8
Sample Date	4/26/2021
VOCs (µg/L)	NE
SVOCs (µg/L)	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Pesticides (µg/L)	ND
Herbicides (µg/L)	ND
PCBs (µg/L)	ND
Inorganics (µg/L)	
Barium	144
Barium (Dissolved)	66.6
Iron	**25900**
Iron (Dissolved)	ND
Lead	ND
Lead (Dissolved)	ND
Manganese	**976**
Manganese (Dissolved)	**871**
Sodium	**55300**
Sodium (Dissolved)	**47100**
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	5.33 J
Perfluorooctanoic Acid (PFOA)	**73.5**

Sample ID	102_LMW-7	103_DUP-1
Sample Date	4/26/2021	4/26/2021
VOCs (µg/L)	NE	NE
SVOCs (µg/L)		
Benzo(a)anthracene	ND	ND
Benzo(a)pyrene	ND	ND
Pesticides (µg/L)	ND	ND
Herbicides (µg/L)	ND	ND
PCBs (µg/L)	ND	ND
Inorganics (µg/L)		
Barium	320	325
Barium (Dissolved)	275	261
Iron	**33200**	**33700**
Iron (Dissolved)	**24800**	**22000**
Lead	ND	ND
Lead (Dissolved)	ND	ND
Manganese	**1180**	**1200**
Manganese (Dissolved)	**1180**	**1160**
Sodium	16300	16500
Sodium (Dissolved)	15900	16100
PFAS (ng/L)		
Perfluorooctanesulfonic Acid (PFOS)	**27.5**	**26.3**
Perfluorooctanoic Acid (PFOA)	**43.4**	**39.8**

Sample ID	107_LMW-14
Sample Date	4/26/2021
VOCs (µg/L)	ND
SVOCs (µg/L)	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Pesticides (µg/L)	ND
Herbicides (µg/L)	ND
PCBs (µg/L)	ND
Inorganics (µg/L)	
Barium	228
Barium (Dissolved)	209
Iron	**7580**
Iron (Dissolved)	**2020**
Lead	ND
Lead (Dissolved)	ND
Manganese	**400**
Manganese (Dissolved)	**407**
Sodium	**21000**
Sodium (Dissolved)	19900
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	3.26
Perfluorooctanoic Acid (PFOA)	**18.4**

Sample ID	053_LMW-5	054_DUP-3	105_LMW-5
Sample Date	5/14/2018	5/14/2018	4/26/2021
VOCs (µg/L)	ND	ND	ND
SVOCs (µg/L)			
Benzo(a)anthracene	**0.0632**	ND	ND
Benzo(a)pyrene	**0.0526** J	ND	ND
Pesticides (µg/L)	ND	ND	ND
Herbicides (µg/L)	NA	ND	NA
PCBs (µg/L)	ND	ND	ND
Inorganics (µg/L)			
Barium	506	497	406
Barium (Dissolved)	378	371	346
Iron	**32800**	**32500**	**13300**
Iron (Dissolved)	**7000**	**6980**	**7780**
Lead	**53.3** J	**41.6**	ND
Lead (Dissolved)	ND	ND	ND
Manganese	**1030**	**1010**	**537**
Manganese (Dissolved)	**1030**	**999**	**517**
Sodium	**25900** J	**25900** J	**22100**
Sodium (Dissolved)	**25900**	**25800**	**21100**
PFAS (ng/L)			
Perfluorooctanesulfonic Acid (PFOS)	NA	NA	2.72
Perfluorooctanoic Acid (PFOA)	NA	NA	**29.3**

Analyte	NYSDEC SGVs
SVOCs (µg/L)	
Benzo(a)anthracene	0.002
Benzo(a)pyrene	0
Inorganics (µg/L)	
Barium	1,000
Iron	300
Lead	25
Manganese	300
Sodium	20,000
Analyte	**NYSDEC June 2021 Guidance Values**
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	10
Perfluorooctanoic Acid (PFOA)	10

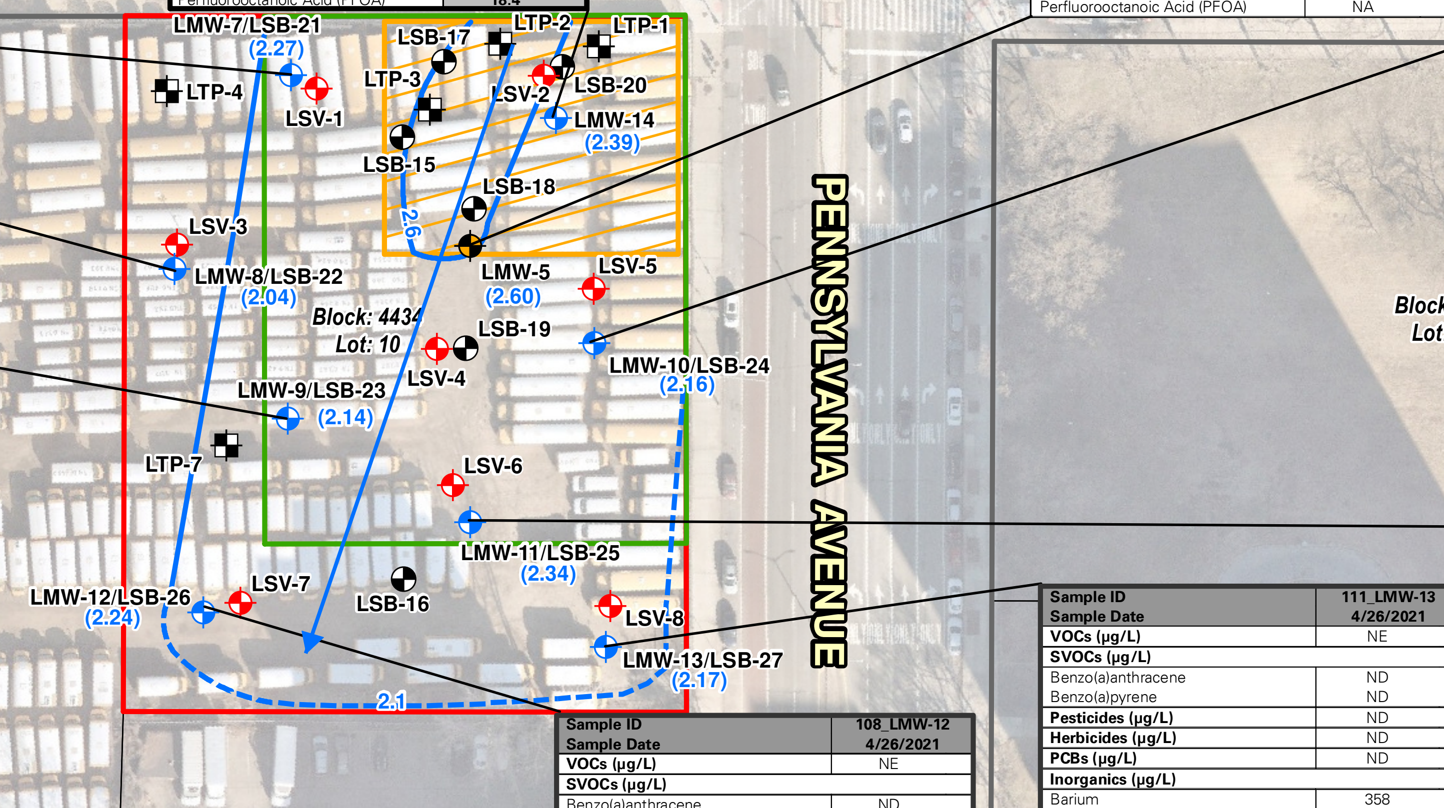
Sample ID	110_LMW-10
Sample Date	4/26/2021
VOCs (µg/L)	NE
SVOCs (µg/L)	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Pesticides (µg/L)	ND
Herbicides (µg/L)	ND
PCBs (µg/L)	ND
Inorganics (µg/L)	
Barium	492
Barium (Dissolved)	378
Iron	**53200**
Iron (Dissolved)	**35000**
Lead	ND
Lead (Dissolved)	ND
Manganese	**1240**
Manganese (Dissolved)	**1250**
Sodium	**49900**
Sodium (Dissolved)	**50100**
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	3.27
Perfluorooctanoic Acid (PFOA)	**30.3**

Sample ID	106_LMW-9
Sample Date	4/26/2021
VOCs (µg/L)	NE
SVOCs (µg/L)	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Pesticides (µg/L)	ND
Herbicides (µg/L)	ND
PCBs (µg/L)	ND
Inorganics (µg/L)	
Barium	306
Barium (Dissolved)	175
Iron	**28200**
Iron (Dissolved)	ND
Lead	ND
Lead (Dissolved)	ND
Manganese	**605**
Manganese (Dissolved)	**582**
Sodium	**150000**
Sodium (Dissolved)	**145000**
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	**10.1** J
Perfluorooctanoic Acid (PFOA)	**169**

Sample ID	109_LMW-11
Sample Date	4/26/2021
VOCs (µg/L)	ND
SVOCs (µg/L)	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Pesticides (µg/L)	ND
Herbicides (µg/L)	ND
PCBs (µg/L)	ND
Inorganics (µg/L)	
Barium	789
Barium (Dissolved)	576
Iron	**41100**
Iron (Dissolved)	**22300**
Lead	ND
Lead (Dissolved)	ND
Manganese	**569**
Manganese (Dissolved)	**564**
Sodium	**30600**
Sodium (Dissolved)	**30400**
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	ND
Perfluorooctanoic Acid (PFOA)	**32.6**

Sample ID	111_LMW-13
Sample Date	4/26/2021
VOCs (µg/L)	NE
SVOCs (µg/L)	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Pesticides (µg/L)	ND
Herbicides (µg/L)	ND
PCBs (µg/L)	ND
Inorganics (µg/L)	
Barium	358
Barium (Dissolved)	237
Iron	**47100**
Iron (Dissolved)	**20700**
Lead	ND
Lead (Dissolved)	ND
Manganese	**370**
Manganese (Dissolved)	**366**
Sodium	**29300**
Sodium (Dissolved)	**29700**
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	5.62
Perfluorooctanoic Acid (PFOA)	**24.9**

Sample ID	108_LMW-12
Sample Date	4/26/2021
VOCs (µg/L)	NE
SVOCs (µg/L)	
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Pesticides (µg/L)	ND
Herbicides (µg/L)	ND
PCBs (µg/L)	ND
Inorganics (µg/L)	
Barium	**1600**
Barium (Dissolved)	**1270**
Iron	**25300**
Iron (Dissolved)	**5600**
Lead	ND
Lead (Dissolved)	ND
Manganese	167
Manganese (Dissolved)	160
Sodium	**70700**
Sodium (Dissolved)	**69000**
PFAS (ng/L)	
Perfluorooctanesulfonic Acid (PFOS)	**23.4** J
Perfluorooctanoic Acid (PFOA)	**70.3**



Legend

- Site Boundary
- 2018 Phase II Soil Boring Location
- 2018 Phase II Test Pit Location
- 2018 Phase II Soil Boring/Monitoring Well Location
- 2021 RI Monitoring Well / Soil Boring Location
- 2021 RI Soil Vapor Point Location
- Tax Parcel
- Tax Block
- AOC-1: Former Gasoline Filling Station
- AOC-2: Former Automotive Dismantling/Wrecking
- Groundwater Flow Direction
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour

Notes:

1. Groundwater 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 703.5, the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water (herein collectively referenced as "NYSDEC SGVs"), and the NYSDEC Part 375 Remedial Programs Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) (June 2021) and the 1,4-Dioxane value reflects the drinking water maximum contaminant level (MCL) adopted by New York State for public water systems (July 2020). Pursuant to Part 375-1.7(f)(2), the NYSDEC will treat the MCL as relevant and appropriate and will consider this value in remedy selection.
2. Detected analytical results above NYSDEC SGVs are bolded and shaded.
3. Sample 054_DUP-3 is a duplicate sample of 053_LMW-5 and sample 103_DUP-1 is a duplicate sample of 102_LMW-7.
4. µg/L = micrograms per liter
5. ng/L = nanograms per liter
6. NA = Not analyzed
7. ND = Not detected
8. NE = No exceedances

Qualifiers:

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

Notes:

1. Aerial imagery provided by Nearmap ltd., collected March 10, 2021.
2. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.
3. AOC-1 and AOC-2 locations are based on a Sanborn Fire Insurance Map dated 1950.
4. 2018 Phase II EI Sample and Test Pit Locations obtained from Phase II EI Report conducted by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. dated 8/24/2018.
5. Sample locations for the RI were collected for soil borings and monitoring wells using classic survey techniques and for soil vapor points using the ArcGIS Collector application on a tablet utilizing the GPS location.
6. LMW-5 was installed in 2018 as part of the Phase II EI and was re-sampled as part of the RI.
7. Groundwater elevations are referenced to North American Vertical Datum of 1988.
8. Chemboxes for samples collected during the 2021 RI are shown with a bold outline.
9. AOC-3: Presence of Historic Fill is identified as site-wide.

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NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project

12096 FLATLANDS AVENUE

BLOCK No. 4434, LOT No. 10

BROOKLYN

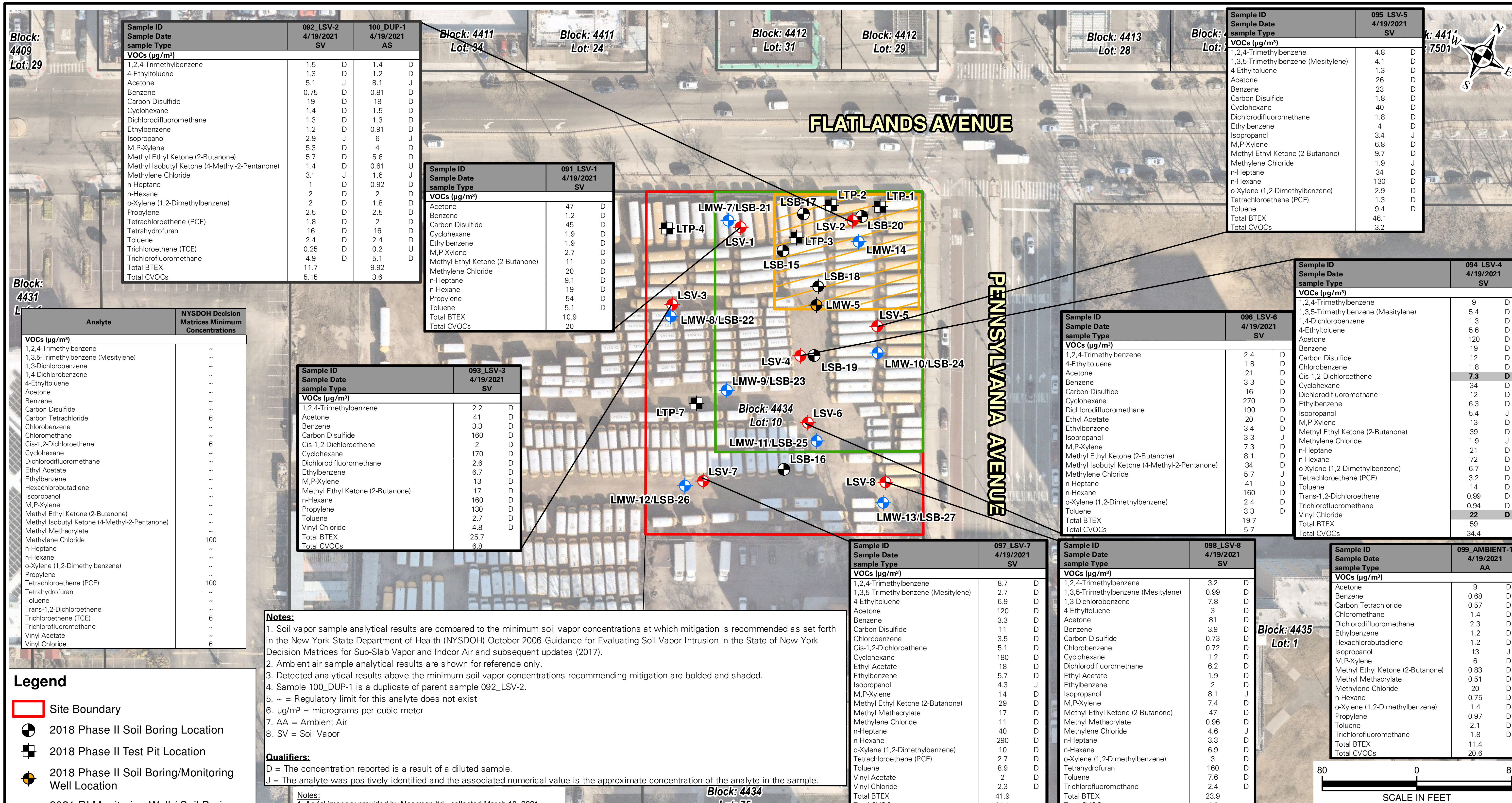
KINGS COUNTY NEW YORK

Drawing Title

GROUDWATER ANALYTICAL RESULTS

Project No.	Figure
100688801	5
Date 9/6/2022	
Scale 1 " = 80 '	
Drawn By IHB	
Last Revised 9/28/2022	

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2022-09 RAWP\Figure 5 - Groundwater Contours and Phase II EI and RI Analytical Results_105.mxd Date: 9/28/2022 User: ibaker Time: 3:15:25 PM



Sample ID Sample Date sample Type	092_LSV-2 4/19/2021 SV		100_DUP-1 4/19/2021 AS	
VOCs (µg/m³)				
1,2,4-Trimethylbenzene	1.5	D	1.4	D
4-Ethyltoluene	1.3	D	1.2	D
Acetone	5.1	J	8.1	J
Benzene	0.75	D	0.81	D
Carbon Disulfide	19	D	18	D
Cyclohexane	1.4	D	1.5	D
Dichlorodifluoromethane	1.3	D	1.3	D
Ethylbenzene	1.2	D	0.91	D
Isopropanol	2.9	J	6	J
M,P-Xylene	5.3	D	4	D
Methyl Ethyl Ketone (2-Butanone)	5.7	D	5.6	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	1.4	D	0.61	U
Methylene Chloride	3.1	J	1.6	J
n-Heptane	1	D	0.92	D
n-Hexane	2	D	2	D
o-Xylene (1,2-Dimethylbenzene)	2	D	1.8	D
Propylene	2.5	D	2.5	D
Tetrachloroethene (PCE)	1.8	D	2	D
Tetrahydrofuran	16	D	16	D
Toluene	2.4	D	2.4	D
Trichloroethene (TCE)	0.25	D	0.2	U
Trichlorofluoromethane	4.9	D	5.1	D
Total BTEX	11.7		9.92	
Total CVOCs	5.15		3.6	

Sample ID Sample Date sample Type	091_LSV-1 4/19/2021 SV	
VOCs (µg/m³)		
Acetone	47	D
Benzene	1.2	D
Carbon Disulfide	45	D
Cyclohexane	1.9	D
Ethylbenzene	1.9	D
M,P-Xylene	2.7	D
Methyl Ethyl Ketone (2-Butanone)	11	D
Methylene Chloride	20	D
n-Heptane	9.1	D
n-Hexane	19	D
Propylene	54	D
Toluene	5.1	D
Total BTEX	10.9	
Total CVOCs	20	

Sample ID Sample Date sample Type	095_LSV-5 4/19/2021 SV	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	4.8	D
1,3,5-Trimethylbenzene (Mesitylene)	4.1	D
4-Ethyltoluene	1.3	D
Acetone	26	D
Benzene	23	D
Carbon Disulfide	1.8	D
Cyclohexane	40	D
Dichlorodifluoromethane	1.8	D
Ethylbenzene	4	D
Isopropanol	3.4	J
M,P-Xylene	6.8	D
Methyl Ethyl Ketone (2-Butanone)	9.7	D
Methylene Chloride	1.9	J
n-Heptane	34	D
n-Hexane	130	D
o-Xylene (1,2-Dimethylbenzene)	2.9	D
Tetrachloroethene (PCE)	1.3	D
Toluene	9.4	D
Total BTEX	46.1	
Total CVOCs	3.2	

Analyte	NYSDOH Decision Matrices Minimum Concentrations
VOCs (µg/m³)	
1,2,4-Trimethylbenzene	~
1,3,5-Trimethylbenzene (Mesitylene)	~
1,3-Dichlorobenzene	~
1,4-Dichlorobenzene	~
4-Ethyltoluene	~
Acetone	~
Benzene	~
Carbon Disulfide	~
Carbon Tetrachloride	6
Chlorobenzene	~
Chloromethane	~
Cis-1,2-Dichloroethene	6
Cyclohexane	~
Dichlorodifluoromethane	~
Ethyl Acetate	~
Ethylbenzene	~
Hexachlorobutadiene	~
Isopropanol	~
M,P-Xylene	~
Methyl Ethyl Ketone (2-Butanone)	~
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~
Methyl Methacrylate	~
Methylene Chloride	100
n-Heptane	~
n-Hexane	~
o-Xylene (1,2-Dimethylbenzene)	~
Propylene	~
Tetrachloroethene (PCE)	100
Tetrahydrofuran	~
Toluene	~
Trans-1,2-Dichloroethene	~
Trichloroethene (TCE)	6
Trichlorofluoromethane	~
Vinyl Acetate	~
Vinyl Chloride	6

Sample ID Sample Date sample Type	093_LSV-3 4/19/2021 SV	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	2.2	D
Acetone	41	D
Benzene	3.3	D
Carbon Disulfide	160	D
Cis-1,2-Dichloroethene	2	D
Cyclohexane	170	D
Dichlorodifluoromethane	2.6	D
Ethylbenzene	6.7	D
M,P-Xylene	13	D
Methyl Ethyl Ketone (2-Butanone)	17	D
n-Hexane	160	D
Propylene	130	D
Toluene	2.7	D
Vinyl Chloride	4.8	D
Total BTEX	25.7	
Total CVOCs	6.8	

Sample ID Sample Date sample Type	096_LSV-6 4/19/2021 SV	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	2.4	D
4-Ethyltoluene	1.8	D
Acetone	21	D
Benzene	3.3	D
Carbon Disulfide	16	D
Cyclohexane	270	D
Dichlorodifluoromethane	190	D
Ethyl Acetate	20	D
Ethylbenzene	3.4	D
Isopropanol	3.3	J
M,P-Xylene	7.3	D
Methyl Ethyl Ketone (2-Butanone)	8.1	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	34	D
Methylene Chloride	5.7	J
n-Heptane	41	D
n-Hexane	160	D
o-Xylene (1,2-Dimethylbenzene)	2.4	D
Toluene	3.3	D
Total BTEX	19.7	
Total CVOCs	5.7	

Sample ID Sample Date sample Type	094_LSV-4 4/19/2021 SV	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	9	D
1,3,5-Trimethylbenzene (Mesitylene)	5.4	D
1,4-Dichlorobenzene	1.3	D
4-Ethyltoluene	5.6	D
Acetone	120	D
Benzene	19	D
Carbon Disulfide	12	D
Chlorobenzene	1.8	D
Cis-1,2-Dichloroethene	**7.3**	**D**
Cyclohexane	34	D
Dichlorodifluoromethane	12	D
Ethylbenzene	6.3	D
Isopropanol	5.4	J
M,P-Xylene	13	D
Methyl Ethyl Ketone (2-Butanone)	39	D
Methylene Chloride	1.9	J
n-Heptane	21	D
n-Hexane	72	D
o-Xylene (1,2-Dimethylbenzene)	6.7	D
Tetrachloroethene (PCE)	3.2	D
Toluene	14	D
Trans-1,2-Dichloroethene	0.99	D
Trichlorofluoromethane	0.94	D
Vinyl Chloride	**22**	**D**
Total BTEX	59	
Total CVOCs	34.4	

Notes:
1. Soil vapor sample analytical results are compared to the minimum soil vapor concentrations at which mitigation is recommended as set forth in the New York State Department of Health (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).
2. Ambient air sample analytical results are shown for reference only.
3. Detected analytical results above the minimum soil vapor concentrations recommending mitigation are bolded and shaded.
4. Sample 100_DUP-1 is a duplicate of parent sample 092_LSV-2.
5. ~ = Regulatory limit for this analyte does not exist
6. µg/m³ = micrograms per cubic meter
7. AA = Ambient Air
8. SV = Soil Vapor

Qualifiers:
D = The concentration reported is a result of a diluted sample.
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

Sample ID Sample Date sample Type	097_LSV-7 4/19/2021 SV	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	8.7	D
1,3,5-Trimethylbenzene (Mesitylene)	2.7	D
4-Ethyltoluene	6.9	D
Acetone	120	D
Benzene	3.3	D
Carbon Disulfide	11	D
Chlorobenzene	3.5	D
Cis-1,2-Dichloroethene	5.1	D
Cyclohexane	180	D
Ethyl Acetate	18	D
Ethylbenzene	5.7	D
Isopropanol	4.3	J
M,P-Xylene	14	D
Methyl Ethyl Ketone (2-Butanone)	29	D
Methyl Methacrylate	17	D
Methylene Chloride	11	D
n-Heptane	40	D
n-Hexane	290	D
o-Xylene (1,2-Dimethylbenzene)	10	D
Tetrachloroethene (PCE)	2.7	D
Toluene	8.9	D
Vinyl Acetate	2	D
Vinyl Chloride	2.3	D
Total BTEX	41.9	
Total CVOCs	21.1	

Sample ID Sample Date sample Type	098_LSV-8 4/19/2021 SV	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	3.2	D
1,3,5-Trimethylbenzene (Mesitylene)	0.99	D
1,3-Dichlorobenzene	7.8	D
4-Ethyltoluene	3	D
Acetone	81	D
Benzene	3.9	D
Carbon Disulfide	0.73	D
Chlorobenzene	0.72	D
Cyclohexane	1.2	D
Dichlorodifluoromethane	6.2	D
Ethyl Acetate	1.9	D
Ethylbenzene	2	D
Isopropanol	8.1	J
M,P-Xylene	7.4	D
Methyl Ethyl Ketone (2-Butanone)	47	D
Methyl Methacrylate	0.96	D
Methylene Chloride	4.6	J
n-Heptane	3.3	D
n-Hexane	6.9	D
o-Xylene (1,2-Dimethylbenzene)	3	D
Tetrahydrofuran	160	D
Toluene	7.6	D
Trichlorofluoromethane	2.4	D
Total BTEX	23.9	
Total CVOCs	4.6	

Sample ID Sample Date sample Type	099_AMBIENT-1 4/19/2021 AA	
VOCs (µg/m³)		
Acetone	9	D
Benzene	0.68	D
Carbon Tetrachloride	0.57	D
Chloromethane	1.4	D
Dichlorodifluoromethane	2.3	D
Ethylbenzene	1.2	D
Hexachlorobutadiene	1.2	D
Isopropanol	13	J
M,P-Xylene	6	D
Methyl Ethyl Ketone (2-Butanone)	0.83	D
Methyl Methacrylate	0.51	D
Methylene Chloride	20	D
n-Hexane	0.75	D
o-Xylene (1,2-Dimethylbenzene)	1.4	D
Propylene	0.97	D
Toluene	2.1	D
Trichlorofluoromethane	1.8	D
Total BTEX	11.4	
Total CVOCs	20.6	

80 0 80
SCALE IN FEET

Legend

- Site Boundary
- 2018 Phase II Soil Boring Location
- 2018 Phase II Test Pit Location
- 2018 Phase II Soil Boring/Monitoring Well Location
- 2021 RI Monitoring Well / Soil Boring Location
- 2021 RI Soil Vapor Point Location
- Tax Parcel
- Tax Block
- AOC-1: Former Gasoline Filling Station
- AOC-2: Former Automotive Dismantling/Wrecking

Notes:
1. Aerial imagery provided by Nearmap ltd., collected March 10, 2021.
2. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.
3. AOC-1 and AOC-2 locations are based on a Sanborn Fire Insurance Map dated 1950.
4. 2018 Phase II EI Sample and Test Pit Locations obtained from Phase II EI Report conducted by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. dated 8/24/2018.
5. Sample locations for the RI were collected for soil borings and monitoring wells using classic survey techniques and for soil vapor points using the ArcGIS Collector application on a tablet utilizing the GPS location.
6. LMW-5 was installed in 2018 as part of the Phase II EI and was re-sampled as part of the RI.
7. Chemboxes for samples collected during the 2021 RI are shown with a bold outline.
8. AOC-3: Presence of Historic Fill is identified as site-wide.

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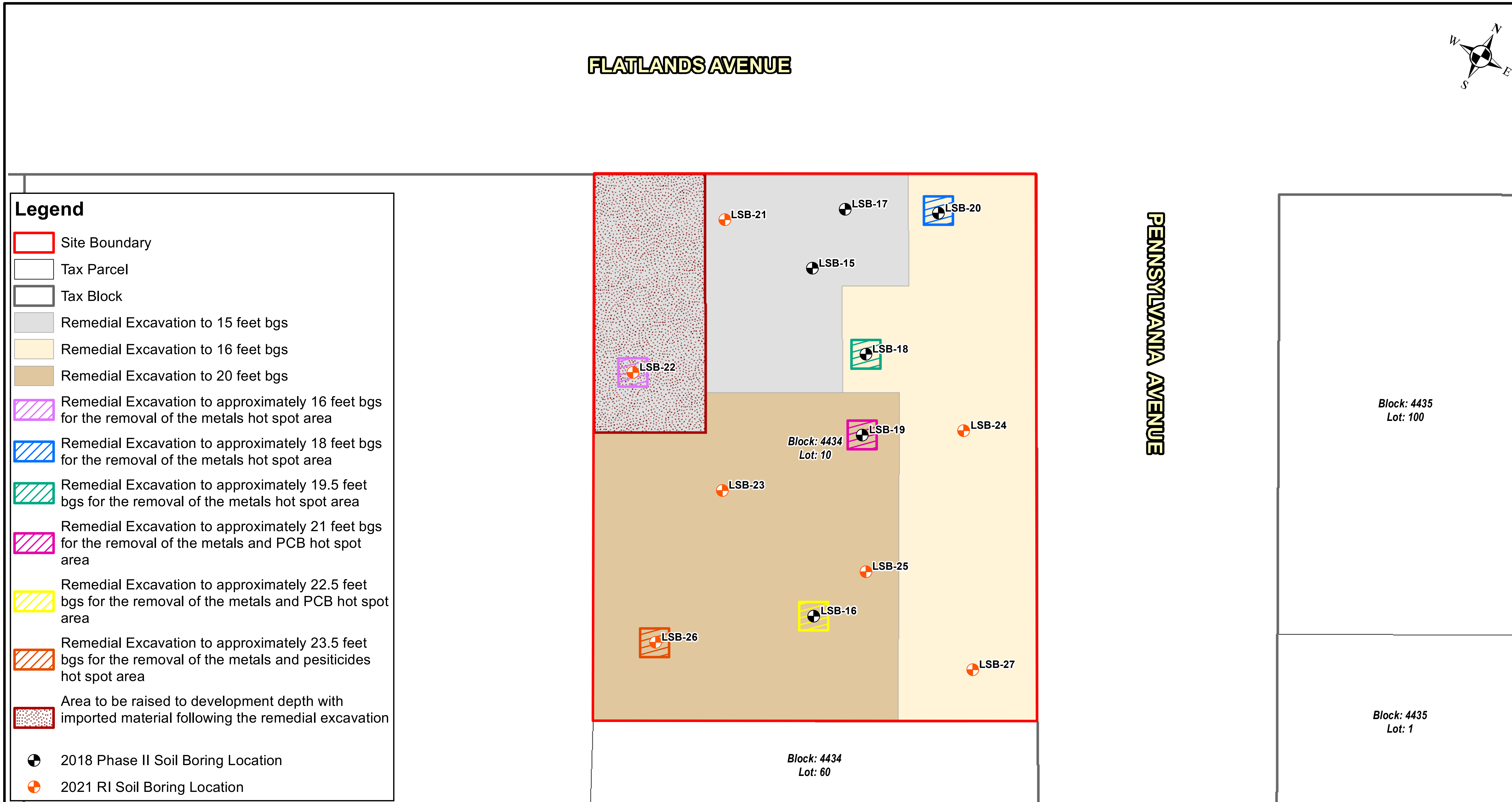
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
12096 FLATLANDS AVENUE
BLOCK No. 4434, LOT No. 10
BROOKLYN
KINGS COUNTY NEW YORK

Drawing Title
SOIL VAPOR ANLAYTICAL RESULTS

Project No.	100688801
Date	9/6/2022
Scale	1 " = 80 '
Drawn By	IHB
Last Revised	9/28/2022
Figure	6



References:
1. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.
2. Topographic contours obtained from "V-001.0.0 - Boundary and Topographic Survey," drawn by Control Point Associates, Inc. , last updated June 22, 2021.
3. bgs = below ground surface
4. SCOs = Soil Cleanup Objectives

50 0 50
SCALE IN FEET

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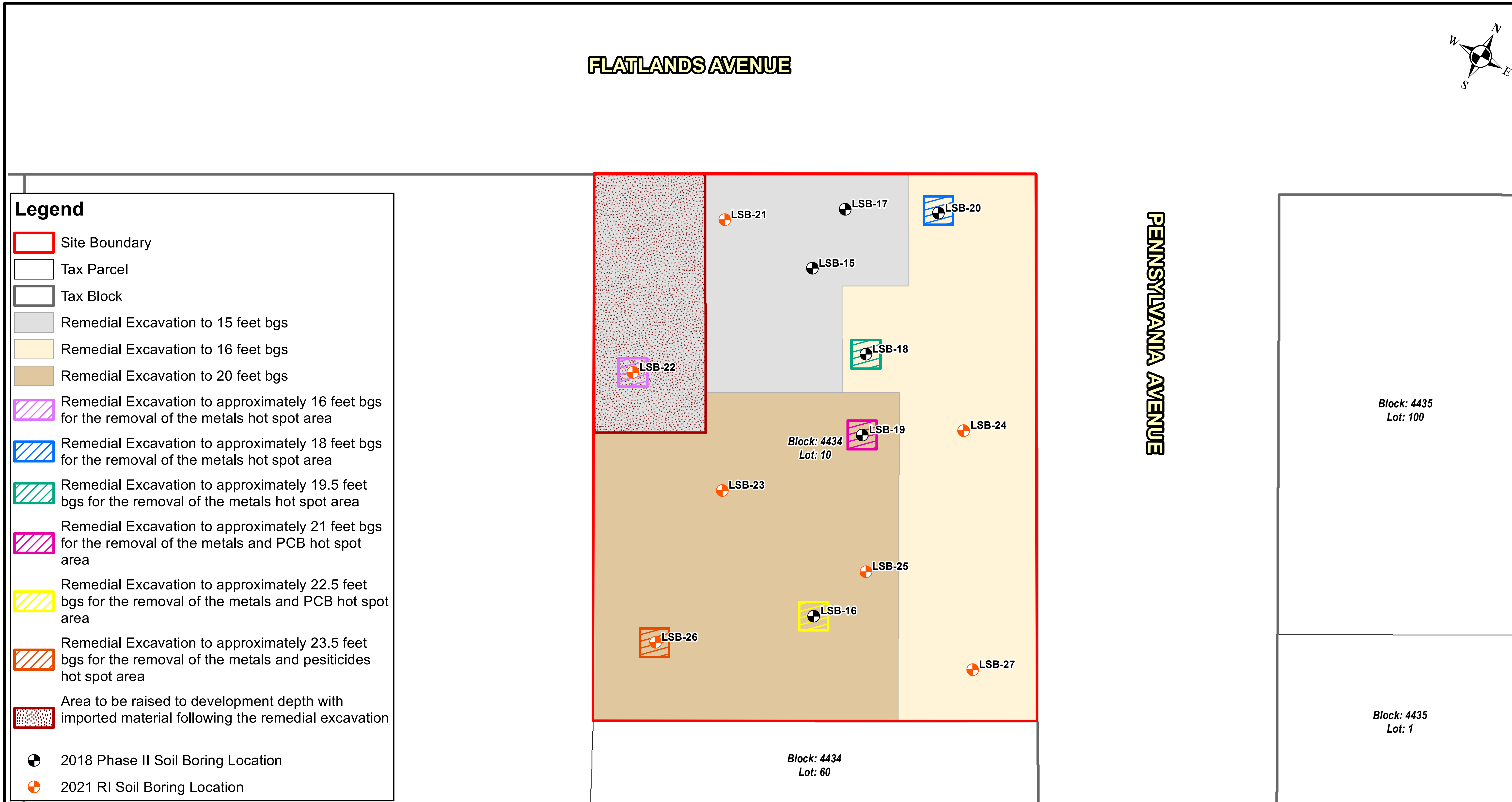
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project	Drawing Title	Project No.	Figure
12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	ALTERNATIVE I – TRACK 1 CLEANUP	100688801 Date: 6/8/2023 Scale: 1 " = 50 ' Drawn By: IHB Last Revised: 6/9/2023	7

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2022-09 RAWP\Figure 7 - Alternative I – Track 1 Cleanupv2.mxd Date: 6/9/2023 User: ibaker Time: 1:45:57 PM



References:
1. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.
2. Topographic contours obtained from "V-001.0.0 - Boundary and Topographic Survey," drawn by Control Point Associates, Inc. , last updated June 22, 2021.
3. bgs = below ground surface
4. SCOs = Soil Cleanup Objectives

50 0 50
SCALE IN FEET

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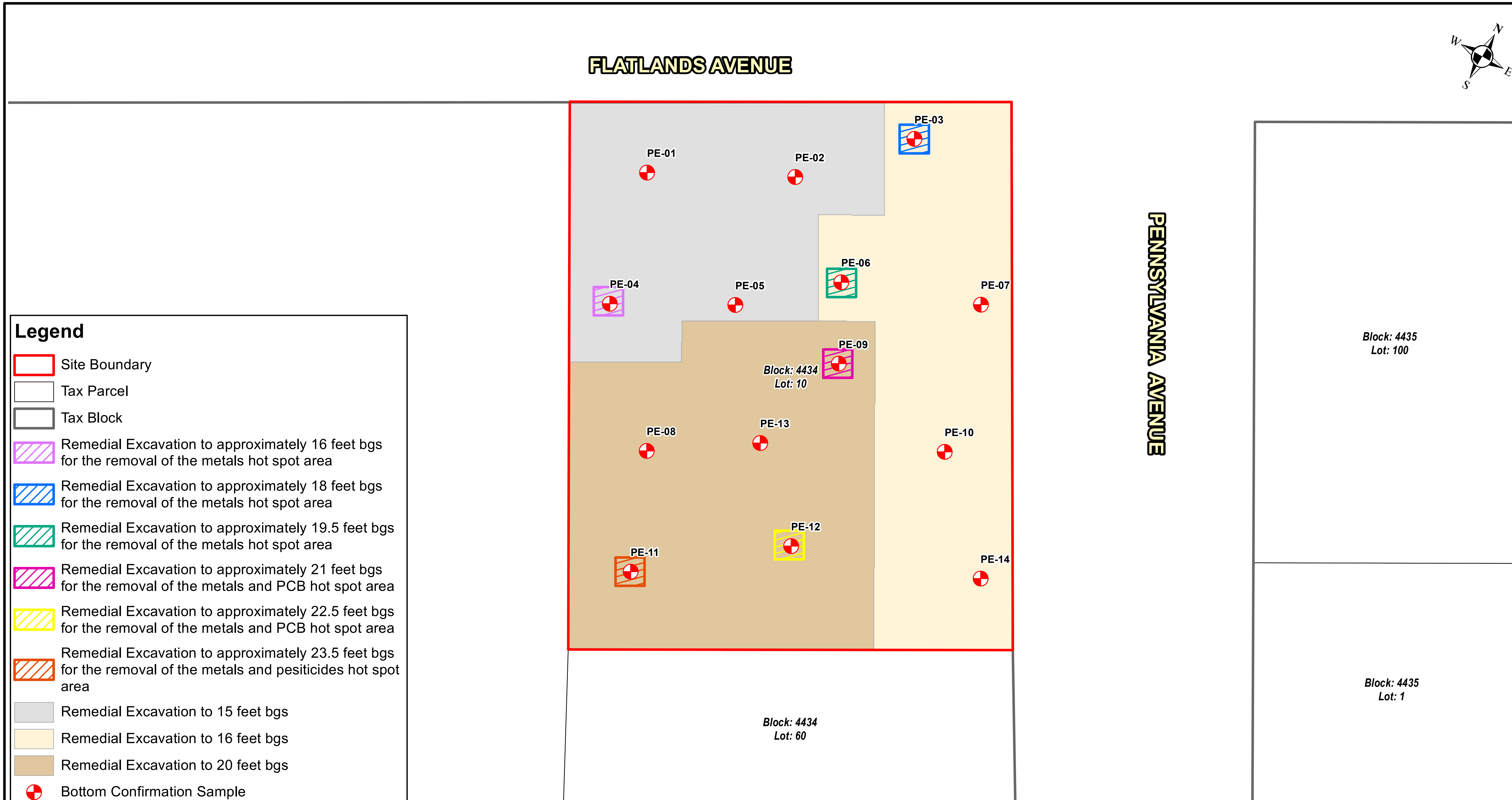
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project	Drawing Title	Project No.	Figure
12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	ALTERNATIVE II – TRACK 2 CLEANUP	100688801 Date 6/8/2023 Scale 1 " = 50 ' Drawn By IHB Last Revised 6/16/2023	8

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2023-06 Phase 1A\Figure 8 - Alternative II – Track 2 Cleanup.mxd Date: 6/16/2023 User: ibaker Time: 4:29:25 PM



References:
1. Aerial imagery provided by Nearmap ltd., collected March 10, 2021.
2. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.

50 0 50
SCALE IN FEET

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Collectively known as Langan
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

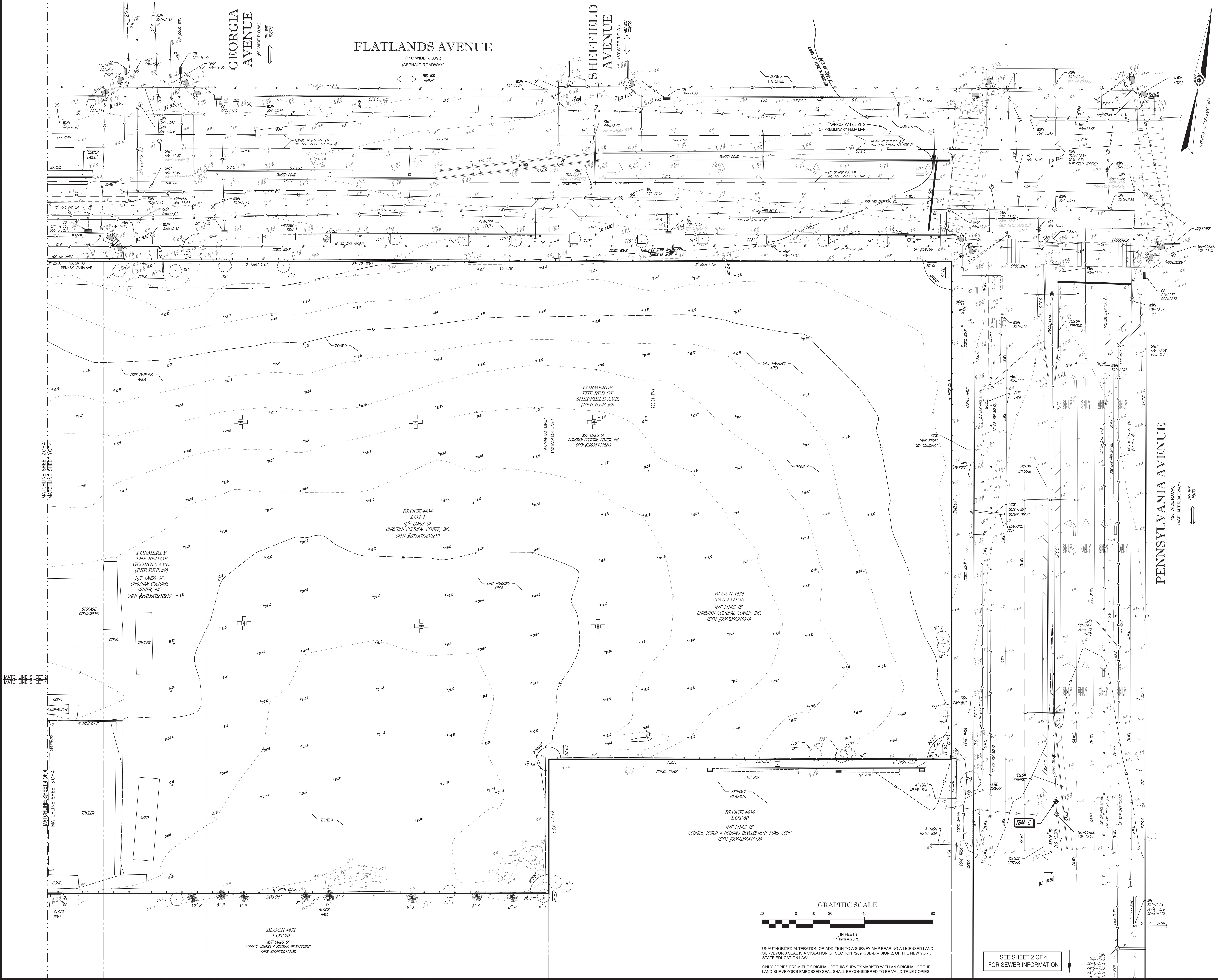
Project	Drawing Title	Project No.	Figure
12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	PROPOSED ENDPOINT CONFIRMATION SAMPLING PLAN	100688801 Date: 9/27/2022 Scale: 1 " = 50 ' Drawn By: IHB Last Revised: 6/15/2023	9

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2022-09 RAWP\Figure 9 - Proposed Endpoint Confirmation Sampling.mxd Date: 6/15/2023 User: ibaker Time: 2:13:40 PM

LANGAN 300 Kimball Drive Parsippany, NJ 07054 T: 973.560.4900 F: 973.560.4901 www.langan.com Langan Engineering & Environmental Services, Inc. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. Langan International LLC Collectively known as Langan NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400	Project 12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	Drawing Title TRUCK ROUTE MAP	Project No. 100688801 Date 9/6/2022 Scale 1 " = 7,000 ' Drawn By IHB	Figure 10

APPENDIX A

Site Survey



GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

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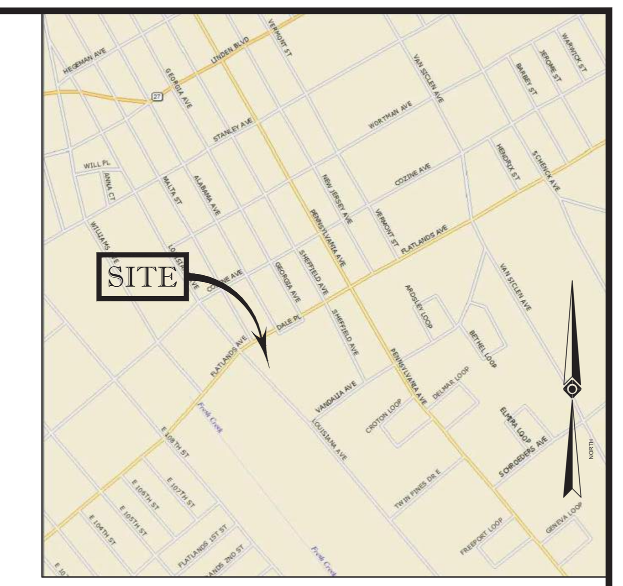

VICINITY MAP
© 2008 DeLorme. Street Atlas USA

LEGEND

- EXISTING CONTOUR
- EXISTING SPOT ELEVATION
- EXIST. TOP OF CURB ELEVATION
- EXIST. GUTTER ELEVATION
- EXIST. TOP OF WALL ELEVATION
- EXIST. BOTTOM OF WALL ELEVATION
- OVERHEAD WIRES
- APPROX. LOC. UNDERGROUND GAS LINE
- APPROX. LOC. UNDERGROUND ELEC. LINE
- APPROX. LOC. UNDERGROUND TEL. LINE
- DEPRESSED CURB
- HYDRANT
- WATER VALVE
- UNKNOWN VALVE
- GAS VALVE
- SMH — SANITARY/SEWER MANHOLE
- MH — UNKNOWN MANHOLE
- WMH — WATER MANHOLE
- RECORD MANHOLE (PER REF. #8)
- UP — UTILITY POLE
- GUY WIRE
- STREET LIGHT
- TRAFFIC SIGNAL POLE
- TRAFFIC SIGNAL
- PAINTED ARROWS
- SIGN
- BOLLARD
- MW — MONITORING WELL
- CATCH BASIN OR INLET
- TREE STUMP & SIZE
- DECIDUOUS TREE & TRUNK SIZE
- CONIFEROUS TREE & TRUNK SIZE
- C.L.F. — CHAIN LINK FENCE
- D.C. — DEPRESSED CURB
- E.O.C. — EDGE OF CONC.
- E.O.P. — EDGE OF PAVEMENT
- L.S.A. — LANDSCAPED AREA
- MC — METAL COVER
- (TYP.) — TYPICAL
- D.W.P. — DETECTABLE WARNING PAD
- S.W.L. — SOLID WHITE LINE
- S.Y.L. — SOLID YELLOW LINE
- D.Y.L. — DOUBLE YELLOW LINE
- DA.W.L. — DASHED WHITE LINE
- N.V.P. — NO VISIBLE PIPE
- (UTO) — UNABLE TO OPEN
- B.O.S. — BOTTOM OF STRUCTURE
- WC — WALL CORNER
- FC — FENCE CORNER
- 1.0' — OFFSET OF STRUCTURE AT GROUND LEVEL RELATIVE TO PROPERTY LINE

SEE SHEET 1 OF 4
FOR NOTES & REFERENCES

PREPARED BY:
CONTROL POINT ASSOCIATES INC. PC
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LONG ISLAND, NY 631.580.2645
SOUTHBOROUGH, MA 508.948.3000
ALBANY, NY 518.217.5010

NO.	DATE	BY	DESCRIPTION	APPROVED
2.	10-14-2021	AB	REVISED CLIENT COMMENTS	WTW
1.	06-22-2021	AB	REVISED CLIENT COMMENTS	WTW

REVISIONS

PROJECT NAME

FLATLANDS AVENUE

LOT 1 / BLOCK 4430, LOTS 1 & 200 / BLOCK 4431
LOT 1 / BLOCK 4432 & LOT 1 / BLOCK 4434
BOROUGH OF BROOKLYN, KINGS COUNTY
CITY AND STATE OF NEW YORK

DRAWING TITLE

BOUNDARY & TOPOGRAPHIC SURVEY

SEAL & SIGNATURE

STATE OF NEW YORK · WILLIAM THEODORE WHIMPLE · 50526 · LICENSED LAND SURVEYOR

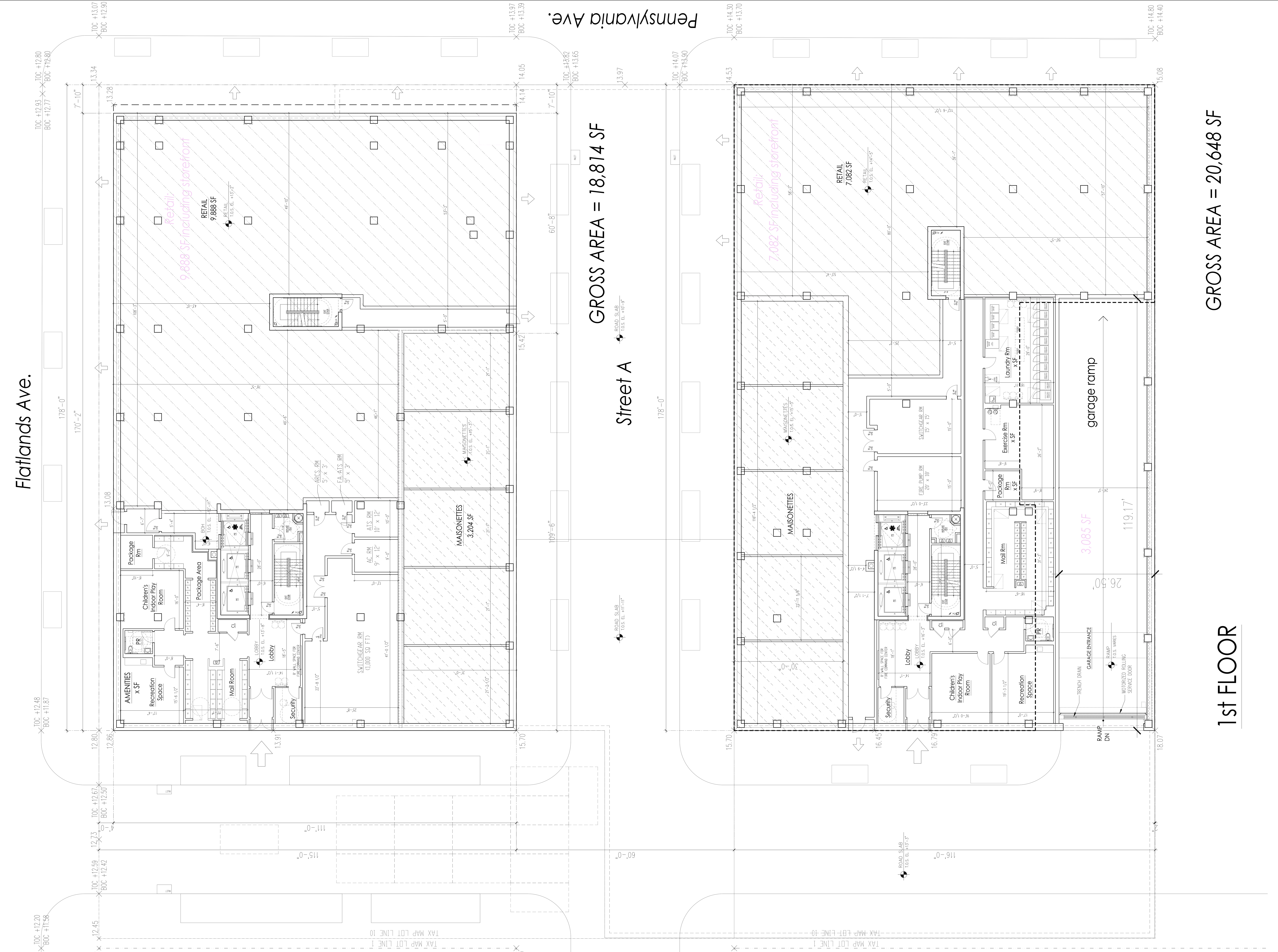
NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION SEAL OR BLUE INK SEAL

10-14-2021
WILLIAM T. WHIMPLE DATE
NEW YORK PROFESSIONAL LAND SURVEYOR #50526

FIELD DATE:	03-02-2020 11-20-2020
FIELD BK:	20-09
F. B. PAGE:	112-113
FIELD CREW:	WR/SP/DQ
DATE:	03-17-2021
SCALE:	1"=20'
PROJECT No:	04-200032
DRAWING BY:	AB
CHK BY:	WTW
APPROVED BY:	WTW
DWG No:	V-001.0.0
CAD FILE No: 04-200032	PAGE No: 3 OF 4

APPENDIX B

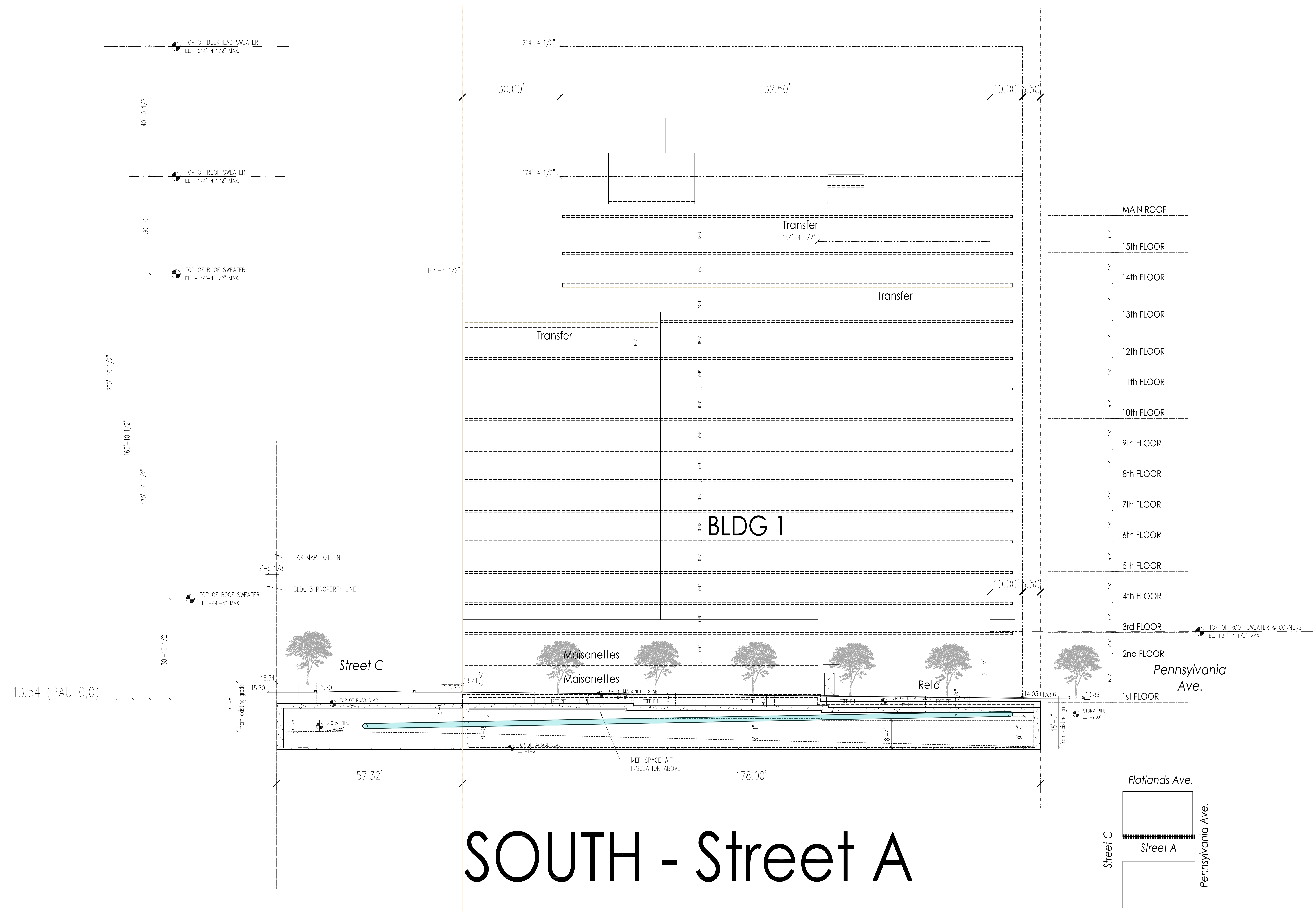
Proposed Development Plans



DRAWING TITLE: BUILDINGS 1 & 2: 1st FLOOR PLAN	PROJECT NAME: CCC / INNOVATIVE URBAN LIVING BROOKLYN, NY		DRAWING REFERENCE NUMBER: -
SLCE*Architects* 1359 BROADWAY NEW YORK, NY 10018	PROJECT NUMBER: 2022-18	CADD FILE: DWGS/BLDGS 1-2	SKETCH NUMBER: X
	DATE: OCTOBER 7, 2022	SCALE: NO SCALE	

CELLAR

DRAWING TITLE:	PROJECT NAME:				DRAWING REFERENCE NUMBER:
BUILDINGS 1 & 2: CELLAR PLAN	CCC / INNOVATIVE URBAN LIVING BROOKLYN, NY				-
SLCEArchitects 1359 BROADWAY NEW YORK, NY 10018	PROJECT NUMBER: 2022-18	CADD FILE: DWGS/BLDGS 1-2	DATE: OCTOBER 7, 2022	SCALE: NO SCALE	SKETCH NUMBER: X



SOUTH - Street A

APPENDIX C

Previous Environmental Reports

(Submitted under separate cover)

APPENDIX D

Construction Health and Safety Plan

CONSTRUCTION HEALTH AND SAFETY PLAN

for

12096 FLATLANDS AVENUE SITE
Brooklyn, New York
NYSDEC BCP Site No. C224290

Prepared For:

Innovative Urban Living, LLC
c/o Gotham Organization, LLC
432 Park Avenue South, Second Floor
New York, New York 10016

Prepared By:

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
300 Kimball Drive
Parsippany, New Jersey 07054

October 2022
100688801

LANGAN

ENVIRONMENTAL HEALTH AND SAFETY PLAN

Client:	**Innovative Urban Living, LLC**
Project:	**Excavation Activities and Groundwater Dewatering During Site Work**
Location:	**12096 Flatlands Avenue, Brooklyn, NY**
Chemical Hazards:	**Volatile Organic Compounds, Semi-Volatile Organic Compounds, Polychlorinated Biphenyls, Pesticides, Metals**
Prepared By:	**Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.**
Version:	**1**
Date:	**October 2022**

Client Contact:	**Bryan Kelly**	**(212) 599-0520**
Langan Project Manager (PM):	**Amanda Forsburg**	**(973) 560-4574**
Langan Health & Safety Manager (HSM):	**Tony Moffa, CHMM**	**(215) 491-6545**
Langan Health and Safety Officer (HSO):	**Field Personnel**	
WorkCare:	**1-888-449-7787**	
Langan Incident/Injury Hotline:	**(973) 560-4699**	

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APPROVALS

By signature, the personnel identified below hereby acknowledge that they have reviewed this Construction Health and Safely Plan (CHASP) and agree to comply with the requirements contained therein as well as the applicable provisions of 29 CFR Parts 1910 and 1926. The undersigned also acknowledge and accept that this CHASP is the project CHASP for the site work described in the Remedial Action Plan (RAP). Furthermore, in reviewing and accepting this CHASP, as currently written, the undersigned agree that to the best of their knowledge, this CHASP adequately identifies the activities and hazards associated with work at this site and describes the appropriate and necessary precautions and protections for site workers required by the applicable OSHA statutes and regulations.

Amanda M. Forsburg ____________________ 10/13/2022

LANGAN Project Manager - PM (Amanda Forsburg) Date

____________________ ____________________

LANGAN Health and Safety Manager (Tony Moffa, CHMM) Date

____________________ ____________________

LANGAN Health and Safety Officer – HSO Date

TABLE OF CONTENTS

LANGAN

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLES

FIGURES

ATTACHMENTS

1.0 INTRODUCTION

1.1 Purpose and Policy

This Construction Health and Safety Plan (CHASP) has been developed to comply with the regulations under Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120(b)(4), Hazardous Waste Operations and Emergency Response. It addresses foreseeable activities associated with the site work activities to be conducted at 12096 Flatlands Avenue in Brooklyn, New York (see Figure 1). This CHASP establishes personnel protection standards and mandatory safety practices and procedures. Additionally, it assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted at known or suspected hazardous waste sites.

Langan personnel involved with inspection of site work activities which involve the displacement of soil and/or material or dewatering of excavations during the proposed development shall comply with the requirements of this CHASP. All Langan personnel engaged in onsite activities will read this document carefully and complete the Safety Briefing Form (Attachment A), a copy of which will be provided to Langan's Project files. Contractors and subcontractors conducting construction-related activities which will disturb or displace soil in the identified AOC are required to develop and follow their own HASP which must be equal or more stringent than the Langan CHASP. Contractors and subcontractors are responsible for their own workers Health and Safety and providing a safe working environment in accordance with all applicable federal, state and local requirements. Each Subcontractor will have a designated Site Health and Safety Manager who will be responsible for ensuring that the designated procedures are implemented in the field. Personnel who have any questions or concerns regarding implementation of this plan are encouraged to request clarification from the Langan Project Manager. Field personnel must follow the designated health and safety procedures, be alert to the hazards associated with working close to vehicles and equipment, and use common sense and exercise reasonable caution at all times.

This CHASP covers construction related field activities which have the potential to disturb and/or displace contaminated fill material. These activities include, but are not limited to excavation, moving and grading of the soil/fill from ground surface to at least between 15 to 22.5 feet bgs to remove known elevated concentrations of semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides exceeding the Unrestricted Use Soil Cleanup Objectives (SCOs) at various locations throughout the Site footprint. Additionally, as part of the site redevelopment activities dewatering may be required that will potentially allow for contact with impacted groundwater.

This CHASP was prepared in accordance with the following documents and/or guidelines:

- Occupational Safety and Health Administration (OSHA) regulations for hazardous site workers (29 CFR 1910.120 and 29 CFR 1926); and,
- NIOSH/OSHA/USCG/USEPA *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.*

Langan's Health and Safety Program and Safe Operating Procedures support this site-specific CHASP.

The level of protection and the procedures specified in this CHASP represent the minimum health and safety requirements to be observed by site personnel engaged in the referenced inspection of construction related activities. Unknown conditions may exist, and known conditions may change. Should an employee find himself or herself in a potentially hazardous situation, the employee will immediately discontinue the hazardous procedures(s) and either personally effect appropriate preventative or corrective measures, or immediately notify the Health and Safety Officer or the Langan Project Manager of the nature of the hazard. In the event of an immediately dangerous or life threatening situation, the employee always has "stop work" authority. Any necessary revision to the Health and Safety procedures will be recorded in the Field Procedure Change Authorization Form (Attachment B), and will require authorization from the Langan Health and Safety Officer and Project Manager.

THE ULTIMATE RESPONSIBILITY FOR THE HEALTH AND SAFETY OF THE INDIVIDUAL EMPLOYEE RESTS WITH THE EMPLOYEE AND HIS OR HER COLLEAGUES. Each employee is responsible for exercising the utmost care and good judgment in protecting his or her own health and safety and that of fellow employees. Should any employee observe a potentially unsafe condition or situation, it is the responsibility of that employee to immediately bring the observed condition to the attention of the appropriate health and safety personnel as designated above and to follow-up the verbal notification by completing the Unsafe Conditions and Practices Form provided in Attachment C, a copy of which will be provided to the Langan Health and Safety Officer.

"Extenuating" circumstances such as budget or time constraints, equipment breakdown, changing or unexpected conditions, never justify unsafe work practices or procedures. In fact, the opposite is true. Under stressful circumstances all project personnel must be mindful of the potential to consciously or unconsciously compromise health and safety standards, and be especially safety conscious. **ALL SITE PERSONNEL ARE EXPECTED TO CONSIDER "SAFETY FIRST" AT ALL TIMES.**

1.2 Site Descriptions

The Site is designated as Block 4434 Lot 10 by the New York City Department of Finance. The Site is an approximately 68,435-square-foot parcel consisting of a vacant gravel lot used for surplus parking for the adjacent Christian Cultural Center (CCC) building, located to the west of the Site. The Site is bound to the north by Flatlands Avenue (formerly Fairfield Avenue prior to 1967) followed by a gasoline filling station, automotive repair facility, carwash, and Sheffield Avenue. The Site is bound to the east by Pennsylvania Avenue followed by a vacant landscaped lot and the northern courtyard of a 20-story residential building (part of the Starrett City Complex), to the south by a 12-story multi-family residential building, and to the west by the western extents of the gravel lot currently used for surplus parking by the CCC.

Historical operations at the properly included automobile junk yards, a gasoline station, and historical filling to raise grades.

1.3 Scope of Work

The site work activities that will occur while Langan is providing environmental oversight include the following tasks:

- Task 1 - Excavation and off-site disposal of soil generated during construction as part of the proposed building foundation;
- Task 2 - Completion of Foundation Construction Dewatering;
- Task 3 – Collection of endpoint soil samples;
- Task 4 – Construction of a the foundation system consisting of the concrete building slab and asphalt-paved road; and,
- Task 5 - Installation of a vapor barrier.

Details of the scopes of work to be completed in each of the work areas for this project are provided within the Remedial Action Work Plan.

The proposed future use of the Site consists of construction of two mixed-use commercial/residential towers in the central and eastern portions of the Site with a single cellar level across the majority of the Site footprint. A private roadway will be constructed at street level on the western portion of the Site. The residential portions of the buildings will be comprised of 100% income-based affordable housing, while the commercial portions will be used for a neighborhood community facility and/or retail space. The cellar will consist of below grade parking, mechanical rooms, and storage.

During construction, all soils excavated or disturbed at the site will be either transported off site for disposal at an approved facility or reused on the Site. Langan personnel conducting activities that will contact the impacted fill or impacted groundwater shall abide to the provisions of this CHASP.

2.0 PROJECT TEAM ORGANIZATION AND RESPONSIBILITIES

This section specifies the Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) Project Organization.

2.1 Langan Project Manager

The Langan Project Manager (PM) is Amanda Forsburg. The PM responsibilities include:

Responsibilities:

- Prepares and organizes the background review of site conditions, the site HASP, and the field team.
- Obtains permission for site access and coordinates activities with appropriate officials.
- Briefs the field team on their specific assignments.
- Coordinates with the Health and Safety Officer (HSO) to ensure that health and safety requirements are met.
- Serves as the liaison with public officials.
- Ensuring that this HASP is developed 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 Health and Safety Manager (HSM)

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

- Serving as a resource in the development and implementation of HASPs;
- Assist in reviewing results of Jobsite Safety Inspections;
- Assisting site Health and Safety Officer (HSO) with development of the HASP, updating HASP as dictated by changing conditions, jobsite inspection results, etc.;
- Maintaining all records on personnel (medical evaluation results, training and certifications, accident investigation results, etc.).

2.3 Health and Safety Officer (HSO)

The Langan Health and Safety Officer (HSO) will be identified prior to the start of field work. The HSO responsibilities include:

- Participating in the development and implementation of this HASP;
- Conducting Jobsite Safety Inspections (Attachment I) and correcting any shortcomings in a timely manner;
- Helping to select proper PPE (Personal Protective Equipment) and periodically inspecting it;
- Ensuring that PPE is properly stored and maintained;
- Controlling entry into and exit from the contaminated areas or zones of the site;
- Confirming each team member's suitability for work based on a current physician's recommendation;
- Monitoring the work parties 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;
- Resolves conflicting situations which may arise concerning safety requirements and working conditions;
- Conducting daily tailgate meetings to review applicable JSAs as well as check-in with site personnel.

3.0 HAZARDS ANALYSIS

This section presents all assessment of the general, chemical, physical and biological hazards that may be encountered during the tasks specified under this CHASP (Section 1.3). A detailed summary on types of potential contaminants of concerns Langan anticipates to encounter at different locations during the intrusive redevelopment and associated remediation is listed in Tables 1 and 2 of this CHASP.

3.1 General Hazard Assessment

A general hazard assessment was conducted for the required field work described in Section 1.3 and the following potential hazards have been identified:

- Inhalation of volatile contaminants;
- Skin and eye contact with contaminants;
- Ingestion of contaminants;
- Inhalation of dusts impacted with SVOCs and metals;
- Physical hazards associated with the use of heavy equipment;
- Excavation hazards;
- Tripping hazards;
- Noise exposure;
- Heat stress (depending on weather conditions);
- Cold exposure (depending on weather conditions);
- Flammable hazards;
- Electrical hazards; and,
- Use of personal protective equipment.

These hazards are further described in the task-by-task hazard analysis in Table 3. Specific chemical, physical and biological hazards are discussed below.

Mitigation and controls will include as needed work procedures, work/rest regiment, dust control measures, personal protective equipment, and respiratory protection as appropriate.

3.2 Chemical Exposure Hazards

The following chemical hazard evaluation for the proposed site development activities is based on the previous environmental investigation of the site. The evaluation has been conducted to identify chemicals/materials that potentially may be present at the site, and to ensure that work activities, personnel protection, and emergency response are consistent with the specific contaminants that potentially could be encountered.

3.2.1 Specific Chemical Hazards Previously Detected at the Site

Impacted fill material has been identified on the subject property as reported in the January 2022 Remedial Investigation Report. In addition, impacted groundwater and soil vapor was identified on-site. Table 1 lists Contaminants of Concern and potentially affected media. The potential contaminants that might be encountered during the field activities and the exposure limits are listed in Table 2.

3.2.2 Chemical Hazard Exposure Routes

Potential hazards and their exposure routes include:

- Inhalation of organic vapors due to the presence of volatile organic compounds from diesel-powered equipment.

- Inadvertent ingestion of potentially toxic substances via hand to mouth contact or deliberate ingestion of materials inadvertently contaminated with potentially toxic materials such as metals.

- Skin and eye contact with contaminants at the site and decontamination activities.

Exposure limits and health effects of selected chemicals are in Table 2. The probability of exposure for each task is outlined in Table 3.

3.2.3 Control of Exposure to Chemical Hazards

To protect potentially exposed personnel the following procedures and protocols will be adopted and used as needed: work procedures will be adhered to, work zones will be established, dust control will be utilized, respirators (if required) and personal protective equipment will be worn, area air monitoring will be conducted during times of disturbance of the impacted fill material and strict personnel decontamination procedures will be followed.

3.3 Physical Hazards

3.3.1 Temperature Extremes

Hot Temperatures
Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE, in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke. If onsite workers exhibit the signs of heat exhaustion or heat stroke, they should seek immediate medical attention.

Cold Temperatures
Workers may be exposed to the hazard of working in a cold environment. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia, as well as slippery surfaces, brittle equipment, poor judgment, and unauthorized procedural changes. In order to prevent frostbite, hypothermia, trench foot and immersion foot, the workers are responsible for dressing warmly in layers with thick socks, gloves, and appropriate head and face gear. Upon the onset of discomfort due to the cold, onsite workers should take regular five to ten minute breaks to warm up inside nearby buildings and to drink warm fluids. Please note that the NYCDEP statute prohibits idling an engine for more than three minutes (one-minute if adjacent to a school). This statue includes the use of a vehicle for the purpose of warming up employees. As such, all contractors and employees shall identify a place to warm up in advance. If discomfort continues and the onsite workers start to exhibit the signs of frostbite, hypothermia, trench foot or immersion foot, they should seek immediate medical attention.

3.3.2 Noise and Air Resources

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps and generators. Hearing protection is required and shall be used in designated areas of the site as indicated by the posted signs.

3.3.3 Hand and Power Tools

In order to complete the various tasks for the project, personnel will utilize 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. Hand and power tools will be inspected prior to use. Proper personal protective equipment shall be worn while utilizing hand and power tools. Ground Fault Circuit Interrupters (GFCIs) are required for all portable electric tools.

3.3.4 Slips, Trips, and Falls

Working in and around the site will pose slip, trip and fall hazards due to equipment, piping, slippery surfaces that may be oil covered, or from surfaces that are wet from rain or ice. Potential adverse health effects include falling to the ground and becoming injured or twisting an ankle. Good housekeeping at the site must be maintained at all times.

3.3.5 Fire and Explosion

Prior to starting all excavation work, a review of appropriate New York City maps will be conducted to identify potential hazards. The possibility of encountering fire and explosion hazards exists from underground utilities and gases. Therefore, all excavation equipment must be grounded.

3.3.6 Material Handling

Manual lifting of heavy objects may be required. Failure to follow proper lifting techniques can result in back injuries and strains. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

Whenever possible, heavy objects must be lifted and moved by mechanical devices rather than by manual effort. The mechanical devices will be appropriate for the lifting or 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, such as a Master Rigger or equivalent. Lifting devices, including equipment, slings, ropes, chains, and straps, 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, and/or parked on an incline, will be chocked to prevent movement. If applicable, outriggers will be extended on a flat, firm surface during operation. The lift and swing path of a crane/equipment will be watched and maintained clear of obstructions. 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 will be made available in all mechanical lifting devices. All material must be stored in tiers, racked, blocked, or otherwise secure to prevent sliding, falling, or collapse. All loads/material will be verified to be secure before transportation.

3.3.7 Confined Space/Excavation Hazards

Personnel entry into trenches or unshored (*e.g.,* lagging) excavations within the designated areas of concern will not be permitted. No other confined spaces are known to exist on Site. If entry into trenches or excavations is required, all work will stop until the CHASP has been revised to address the new hazards.

3.3.8 Working Near Equipment

Personnel working in the immediate vicinity of heavy equipment (*e.g.*, excavators, loaders, etc.) may encounter physical hazards resulting from contact with equipment. Field personnel should be aware of the presence of these hazards at all times and take appropriate action to avoid them. Due to the limited ability to communicate when wearing respiratory protection, the risk is increased. Workers must be careful to communicate with heavy equipment operators regarding their location, and should maintain a safe distance from operating equipment at all times. Prior to working around equipment, the site personnel will review appropriate hand signals with the operator.

Equipment will be equipped with back up alarms.

3.3.9 Electrical Safety

Personnel may utilize 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. Ground Fault Circuit Interrupters (GFCIs) are required for all portable electric tools.

3.3.10 Utilities

Prior to the start of any intrusive work, the location of above-ground and underground utilities and other structures will be completed by the contractor/subcontractor responsible for completing construction activities.

3.3.11 Vehicular Traffic

Portions of site activities (load in and load out) will be conducted in the street so vehicular and pedestrian traffic will be present. Appropriate precautions to protect the on-site workers and civilians should be used including the use of cones and traffic vests as appropriate.

3.4 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals and insects. As the potential for exposure to blood borne pathogens during implementation of the RAWP is anticipated to be low, a Blood Borne Pathogen Exposure Plan (BBPEP) is not required. A BBPEP will be prepared if site operation requires its implementation.

3.4.1 Animals

During site operations, animals such as dogs, cats, pigeons, mice, and rats may be encountered. Workers shall use discretion and avoid all contact with animals. Bites and scratches from dogs and cats can be painful and if the animal is rabid, the potential for contracting rabies exists. Contact with rat and mice droppings may lead to contracting hantavirus. Inhalation of dried pigeon droppings may lead to psittacosis. Cryptococcosis and histoplasmosis are also diseases associated with exposure to dried bird droppings but these are less likely to occur in this occupational setting.

3.4.2 Insects

Insects, including bees, wasps, hornets, mosquitoes, spiders, and ticks may be present at the site. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. In addition, mosquito bites may lead to St. Louis encephalitis or West Nile encephalitis.

3.4.3 Wound Care

A source of occupational exposure may occur when an employee gives First Aid and or CPR to an individual who had infectious blood. The occupational exposure occurs when there is the possibility for an employee's eyes, mucous membranes, non-intact skin (i.e., cut and abraded skin) to come into contact with potentially infectious materials from another employee. If an accident were to occur where First Aid would need to be administered, the person administering the First Aid will presume that any wounds and materials used are contaminated with BBP and should wear the appropriate PPE to prevent contact with these materials. Additionally, should the use of First Aid materials and or clothing that was potentially contaminated with BBP be encountered these materials should be property containerized and transported to the nearest hospital for proper disposal.

3.5 Coronavirus

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).
- Wear face coverings when around other worker to minimize spread of COVID-19. (May be required in certain states or locations.)

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, use if face coverings and ensure a safe distance of 6 feet can be established between workers.

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, use of face coverings and other potential exposure issues/concerns.

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, shortness of breath chills, repeated shaking with chills, muscle pain, headache, sore throat, or new loss of taste or smell. 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.

3.6 Task Hazard Analysis

The tasks to be completed during the proposed site work activities, as summarized in Section 1.3, are listed in Table 3 with a Hazard Analysis for each task.

4.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

4.1 Levels of Protection

PPE must protect workers from the specific hazards they are likely to encounter 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 these levels of protection will be based on continuous air monitoring results as described in Section 5.0. The decision to modify standard PPE will be made by the HSO after conferring with the Langan Project Manager. The levels of protection are described below.

- **Level D Protection**

  a. Safety glasses with sideshields or chemical splash goggles
  b. Safety boots/shoes (toe-protected)
  c. Hard hat
  d. Long sleeve work shirt and work pants
  e. Nitrile gloves
  f. Hearing protection (as needed)
  g. Reflective traffic vest

- **Level D Protection (Modified)**

  a. Safety glasses with sideshields or chemical splash goggles
  b. Safety boots/shoes (toe-protected)
  c. Disposable chemical-resistant boot covers
  d. Coveralls (polycoated Tyvek or equivalent to be worn when contact with wet contaminated soil, groundwater, or non-aqueous phase liquids is anticipated)
  e. Hard hat
  f. Long sleeve work shirt and work pants
  g. Nitrile gloves
  h. Hearing protection (as needed)
  i. Reflective traffic vest

- **Level C Protection**

  a. Full face-piece, air-purifying, cartridge*-equipped, NIOSH-approved respirator [*combo cartridge P100/OV/CL/HC/SD/CD/HS (escape)]
  b. Inner (latex) and outer (nitrile) chemical-resistant glove
  c. Chemical-resistant safety boots/shoes (toe-protected)
  d. Disposable chemical-resistant boot covers
  e. Hard hat
  f. Long sleeve work shirt and work pants
  g. Coveralls (Tyvek or equivalent, poly-coated Tyvek will be worn when contact, or anticipated contact with wet contaminated soils, ground water, and/or non-aqueous phase liquids (NAPL) is anticipated)
  h. Hearing protection (as needed)
  i. Reflective traffic vest

The action levels used in determining the necessary levels of respiratory protection and upgrading to Level C are provided in Table 4. The written Respiratory Protection Program is maintained by Langan's H&S Department. The monitoring procedures and equipment are outlined in Section 5.0.

4.2 Respirator Fit-Test

All Langan employees and subcontractors performing site work who could be exposed to hazardous substances at the work site are in possession of a full face-piece, air-purifying respirator and have been successfully quantitative fit-tested within the past year. Quantitative fit-test records are maintained by Langan's H&S Department.

4.3 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.

5.0 AIR QUALITY MONITORING AND ACTIONS LEVELS

5.1 Monitoring During Site Operations

Atmospheric air monitoring results are 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 CHASP action levels.

During site work involving disturbance of fill material, real time air monitoring will 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. Dust monitoring will be accomplished with an aerosol monitor. Air monitoring will be the responsibility of the HSO or designee. Air monitoring will be conducted approximately every 30 minutes during ground intrusive activities in the AOC on the project site. All manufacturers' instructions for instrumentation and calibration will be available onsite.

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

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

5.1.1 Volatile Organic Compounds

Monitoring with a PID, such as a MiniRAE 2000 (10.6v) or equivalent will occur during intrusive work. 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 <u>at least</u> every 30 minutes, or whenever there is any indication that concentrations may have changed (odors, visible gases, etc.) since the last measurement. Instrument action levels for monitored gases are provided in Table 4.

5.1.2 Dust

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 Thermo Personal DataRam (pDR) or a TSI DustTrak should 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. Instrument action levels for dust monitoring are provided in Table 4.

5.2 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.

5.3 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.

6.0 COMMUNITY HEALTH AND SAFETY CONSIDERATIONS

Community air monitoring will be conducted in compliance with the NYSDOH Generic Community Air Monitoring Program (CAMP) provided as Attachment E.

Langan will conduct monitoring for dust and VOCs during ground-intrusive work. Upwind concentrations of VOCs and dust will be monitored continuously each day to establish background concentrations. Langan will monitor VOCs and dust at the downwind perimeter of the work zone, which will be established at a point on the Site where the general public or site employees may be present. Monitoring for VOCs will be conducted with a PID equipped with a 10.6 eV bulb. Dust emissions will be monitored using real-time monitoring equipment capable of measuring PM-10 (e.g., DustTrak).

Sustained concentrations of VOCs or PM10 will be reported to the NYSDEC and NYSDOH Project Managers and included in the daily report. In addition, a map showing the location of the CAMP station and work zone air monitoring station will be included in the daily report.

7.0 WORK ZONES AND DECONTAMINATION

7.1 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.

7.2 Contamination Control

7.2.1 Personnel Decontamination Station

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

7.2.2 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.

7.2.3 Personnel Decontamination Sequence

Decontamination will be performed by removing all PPE used in EZ and placing it in drums/trash cans at the CRZ. Baby wipes shall 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, tools and Investigative Derived Waste (i.e., soil cutting) are provided below.

7.2.4 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.

7.2.5 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.

7.2.6 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.

7.3 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:

Signal	Meaning
Hand gripping throat	Out of air, can't breathe
Grip on partner's wrist or placement of both hands around partner's waist	Leave area immediately, no debate
Hands on top of head	Need assistance
Thumbs up	Okay, I'm all right, I understand
Thumbs down	No, negative

8.0 MEDICAL SURVEILLANCE

All personnel who will be performing field work involving potential exposure to toxic and hazardous substances will be required to have passed an initial baseline medical examination, with annual 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. Results of medical evaluations are maintained by Langan's H&S Department.

9.0 EMERGENCY RESPONSE PLAN

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, 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 the Langan Incident/Injury Hotline (973-560-4699) should be called as soon as possible.

9.1 Responsibilities

9.1.1 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.

9.1.2 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.

9.1.3 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.

9.2 Communications

Once an emergency situation has been stabilized or as soon as practically possible, the HSO will contact the Langan Incident/Injury Hotline (973-560-4699) and Project Manager of identify any emergency situation.

9.3 Local Emergency Support Units

In order to be able to deal with any emergency that might occur during investigative activities at the site, Attachment F will be available in the field vehicles 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. Due to traffic congestion that is prevalent in the New York metropolitan area, alternate hospital routes will need to be considered. The Emergency Coordinator will determine the appropriate route based on time of day and traffic patterns. Changes in the referenced primary facilities shall be documented with the CHASP Field Change Authorization Request Form (Attachment B).

The Emergency Phone Numbers listed are preliminary. Upon mobilization, the HSO shall verify all numbers and document the changes in the Site Logbook. Any changes shall also be documented with the CHASP Field Change Authorization Request Form.

Hospital route maps will be provided to all field personnel.

9.4 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.

9.5 Emergency Medical Treatment

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

First Aid Kit:	Vehicles
Emergency Eye Wash:	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. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. 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.

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

Only in non-emergency situations will an injured person be transported to the hospital by means other than an ambulance.

Nearest hospital: **Brookdale University Hospital**
1 Brookdale Plaza
Brooklyn, NY 11212
(718)-240-5363
(directions from site to hospital found on Figure 2)

9.6 Non-Emergency Medical Treatment

In case of injury to personnel, which is not a medical emergency the employee will contact WorkCare at (1-888-449-7787). WorkCare provides access 24 hours / 7 days a week to experienced occupational health nurses and physicians who confer with employees at the onset of a work-related injury or illness. WorkCare will provide over the phone injury treatment or direct employees to medical treatment by third party provider, if appropriate.

9.7 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 implementation of the RAWP, 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.

9.8 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).

9.8.1 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.

9.9 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.

9.10 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Safety Data Sheet (SDS) 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.

9.11 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 advise 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.

9.12 Incident Reporting

Once first aid and/or emergency response needs have been met, the following parties are to be contacted:

- WorkCare (1-888-449-7787)
- Langan Incident/Injury Report Hotline (973-560-4699)
- Langan Project Manager, Amanda Forsburg (973-560-4574)
- Langan Health and Safety Manager, Tony Moffa (215-491-6500)
- The employer of any injured worker who is not a Langan employee

For emergencies involving personal injury and/or exposure including near-misses, the HSO or designee will complete and submit an Incident Report form (Attachment G) within 24 hours. If the employee involved is not a Langan employee, his employer shall receive a copy of the report.

9.13 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.

9.14 Spill Control and Response

All small spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the SDS 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 CHASP, 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.

9.15 Emergency Equipment

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

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

9.16 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.

10.0 TRAINING

10.1 General Health and Safety Training

Completion of an initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training program (or its equivalent) as detailed in OSHA's 29 CFR 1910.120(e) is required for all employees who will perform work in areas where the potential for a toxic exposure exists. Annual 8-hour refresher training is also required to maintain competencies to ensure a safe work environment.

10.2 Site-Specific Training

Prior to commencement of site activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include a documented verbal review of the entire CHASP and all the provisions within the CHASP document. Should any new employees arrive on-site, they will also be given a documented full CHASP review – or one that address the appropriate tasks that remain at the time of the new employee's arrival.

10.3 Onsite Safety Briefings

Project personnel and visitors will participate in documented daily on-site health and safety briefings ("Tailgate Talks") led by the HSO to assist site personnel in safely conducting their work activities. The briefings will include information on operations to be conducted that shift, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity for the work crews to be updated on monitoring results. Prior to starting any new activity, a training session will be held for crew members involved in the activity. The Safety Briefing form (Attachment A) can be used to facilitate this effort.

10.4 Hazard Communication

All material brought on-site will be in the appropriate containers and will be properly labeled. The SDS for unleaded gasoline, diesel fuel, and hydraulic fluid are attached. Langan's written Hazard Communication program, in compliance with 29 CFR 1910.1200, is maintained by Langan's H&S Department.

11.0 RECORDKEEPING

The following is a summary of required health and safety logs, reports and recordkeeping.

11.1 Field Change Authorization Request

A field change authorization request is to be completed for requesting a change to this CHASP (Attachment B). Any changes to the work to be performed that is not included in the CHASP 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.

11.2 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 Langan's H&S Department.

11.3 Onsite Log

A log of personnel on site each day will be kept by the HSO or designee.

11.4 Daily Safety Meetings ("Tailgate Talks")

Completed Safety Briefing forms will be maintained by the HSO.

11.5 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.

11.6 Hazard Communication Program/SDS

Safety Data Sheets (SDS) have been obtained for applicable substances and are included in this CHASP (Attachment H). Langan's written Hazard Communication program, in compliance with 29 CFR 1910.1200, is maintained by Langan's H&S Department.

11.7 Documentation

Employees are required to contact WorkCare at (1-888-449-7787) to document incidents/injuries which are not medical emergencies. 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 (973-560-4699) and the client representative to report the incident or near miss. A written report must be completed and submitted to the client representative 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.

12.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have been verbally given a full CHASP review by Langan personnel, and understand the provisions of this EHS Plan. It is maintained on site by the HSO as a project record.

Each field team member shall sign this section after Site-specific training is completed and before being permitted to work onsite.

Name (Print and Sign)	***Company***	***Date***

\\langan.com\data\PAR\data8\100688801\Project Data_Discipline\Environmental\Reports_Block 4434 Lot 10 C224290 (Phase 1A)\2022-10 BCP RAWP (Lot 10)\Appendix D - CHASP\Phase 1A Lot 10 - CHASP (2022-10-13)_FINAL.docx

TABLES

TABLE 1
CONTAMINANTS OF CONCERN
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Contaminant of Concern	Affected Media
SEMI-VOLATILES	
Common Historic Fill Contaminants:	Soil
Benzo(a)anthracene	Soil
Benzo(b)flouranthene	Soil
Benzo(a)pyrene	Soil
Benzo(k)fluoranthene	Soil
Chrysene	Soil
Dibenzo(a,h)anthracene	Soil
Indeno(1,2,3-cd)pyrene	Soil
PESTICIDES	
4-4'-DDD	Soil
4-4'-DDE	Soil
4-4'-DDT	Soil
Dieldrin	Soil
PCBs	
Total PCBs	Soil
METALS	
Lead	Soil / Groundwater
Arsenic	Soil
Barium	Soil / Groundwater
Cadmium	Soil
Chromium	Soil
Mercury	Soil / Groundwater
Manganese	Groundwater
Copper	Soil / Groundwater
Nickel	Soil
Selenium	Soil
Sodium	Groundwater
Silver	Soil
Zinc	Soil

\\Langan.com\data\PAR\data8\100688801\Health and Safety\HASP\2022-09 - Phase IA Lot 10 CHASP\Tables\HASP TABLE 1 - Contaminants of Concern.doc

TABLE 2
SELECTED POTENTIAL CHEMICAL EXPOSURE LIMITS AND HEALTH EFFECTS
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Chemical	Permissible Exposure Limit	IDLH Limit	Exposure Routes	Exposure Symptoms
Benzene	1 ppm	50 ppm	Inhalation, Skin Absorption, Ingestion, skin and/or eye contact	Irritate eyes, skin, nose; respiratory system; giddiness; head, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone marrow depression; [carcinogenic]
Toluene	200 ppm	500 ppm	Inhalation, Skin Absorption, Ingestion, skin and/or eye contact	Irritate eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage; mucous membrane; narcosis, coma
Ethylbenzene	100 ppm	800 ppm (10% LEL)	Inhalation, Ingestion, skin and/or eye contact	Irritate eyes, skin, mucous membrane ;headache, dermatitis; narcosis, coma
Xylenes	100 ppm	900 ppm	Inhalation, Skin Absorption, Ingestion, skin and/or eye contact	Irritate eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corn vacuolization; anorexia, nausea, vomit, abdominal pain; dermatitis
Tetrachloroethene	15 ppm	150 ppm	Inhalation, Skin Absorption, Ingestion, skin and/or eye contact	Nausea, vomiting, abdominal pain, tremor fingers, jaundice, hepatitis, liver tenderness, dermatitis, monocytosis, kidney damage [potential occupational carcinogen]
Trichloroethene	100 ppm	1,000 ppm	Inhalation, Skin Absorption, Ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

TABLE 2
SELECTED POTENTIAL CHEMICAL EXPOSURE LIMITS AND HEALTH EFFECTS
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Chemical	Permissible Exposure Limit	IDLH Limit	Exposure Routes	Exposure Symptoms
Total Volatile Organics	15 ppm	150 ppm	Inhalation, Skin Absorption, Ingestion	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]
Benzo(a)anthracene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Benzo(b)fluoranthene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Benzo(k)fluoranthene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Benzo(a)pyrene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Chrysene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Dibenzo(a,h)anthracene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Flouranthene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Indeno (1,2,3-cd) pyrene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Pyrene	0.2 mg/m^3	80 mg/m^3	Inhalation, Skin Absorption, Ingestion	Irritate eyes, skin, upper respiratory system, cough
Lead	0.05 mg/m^3	100 mg/m^3	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 eyes; hypertension

TABLE 2
SELECTED POTENTIAL CHEMICAL EXPOSURE LIMITS AND HEALTH EFFECTS
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Chemical	Permissible Exposure Limit	IDLH Limit	Exposure Routes	Exposure Symptoms
Arsenic	0.010 mg/m^3	5 mg/m^3	Inhalation, Ingestion, Skin Absorption, Skin and/or Eye Contact	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]
Hexavalent Chromium	5 mg/m^3	250 mg/m^3	Inhalation, Ingestion, Skin and/or Eye Contact	Irritation eyes, skin; lung fibrosis (histologic)
Total Chromium	5 mg/m^3	250 mg/m^3	Inhalation, Ingestion, Skin and/or Eye Contact	Irritation eyes, skin; lung fibrosis (histologic)
Mercury	0.1 mg/m^3	10 mg/m^3	Inhalation, Ingestion, Skin Absorption, Skin and/or Eye Contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria
Cadmium	0.005 mg/m^3	9 mg/m^3	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]
Copper	1 mg/m^3	100 mg/m^3	Inhalation, Ingestion, skin and/or eye contact	Irritation eyes, respiratory system; cough, dyspnea (breathing difficulty), wheezing; [potential occupational carcinogen]

TABLE 2
SELECTED POTENTIAL CHEMICAL EXPOSURE LIMITS AND HEALTH EFFECTS
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Chemical	Permissible Exposure Limit	IDLH Limit	Exposure Routes	Exposure Symptoms
Nickel	1 mg/m^3	10 mg/m^3	Inhalation, Skin Absorption, Ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria

--- No exposure limits listed in the NIOSH Pocket Guide to Chemical Hazards dated November 2010.

TABLE 3
HAZARD ANALYSIS
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Task	Potential Risk	Description	Control Measure
1, 2, 3	Lifting equipment	Improper lifting/carrying of equipment and materials	Follow safe lifting and general material handling
1, 2, 3, 4, 5	Noise	Loud sounds caused by the machines during drilling, or excavation	Wear proper PPE (hearing protection)
1, 2, 3, 4, 5	Working near heavy machinery	Close proximity to drill rig and/or construction equipment	Be aware of surroundings, wear safety vest and hard hat
1, 2, 3, 4, 5	Slips, trips, and falls	Any number of injuries from slips, trips, and falls in carrying out these tasks	Good housekeeping at site, constant awareness and focus on the task
1, 2, 3, 4, 5	Inhalation of Dust	Breathing in visible dust from earthwork using drills or excavators	Wear proper PPE, monitor air for dust concentrations, use dust suppression techniques
1, 2, 3, 4, 5	Inhalation of Volatiles	Breathing in volatiles from earthwork using drills or excavators causing dust	Wear proper PPE, monitor air for volatile concentrations, use dust suppression techniques
1, 2	Utilities	Hitting utility lines during drilling and or excavating	Use proper mark out of underground utilities before beginning earthwork
1, 2, 3, 4, 5	Skin contact with contaminated material	Material falls on skin; gets in eye	Wear proper PPE; follow safe work practices
1, 2, 3, 4, 5	Ingestion of contaminated material	Material falls on skin; gets into mouth	Wear proper PPE; follow safe work practices
1, 2, 3, 4, 5	Skin and eye contact with contaminated material	Material falls on skin; gets in eye	Wear proper PPE; follow safe work practices
1, 2, 3, 4, 5	Heat Stress	Stress or exhaustion related to high temperatures	Hydrate and rest as needed
1, 2, 3, 4, 5	Cold Stress	Stress or exhaustion related to low temperatures; hypothermia	Wear proper PPE; follow safe work practices
1, 2, 3, 4, 5	Bites and stings	Bee stings, ticks, snake bites	Wear proper PPE, be watchful, follow safe work practices
1, 2, 3, 4, 5	Lacerations and abrasions	Many opportunities working with hand tools	Inspect equipment being used for sharp edges, wear proper PPE; follow safe work practices

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TABLE 4
INSTRUMENTATION ACTION LEVELS
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Instrument	Action Level	Level of Protection / Action Required
PID	Background to 5 ppm	Level D/No respirator; no further action required
	> 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 5 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	Level C/ 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.
	> 30 ppm (steady state condition) within AOC zone	Stop Work / Suppress Emissions / Evacuate and re-evaluate.
	> 150 ppm	Evacuate the work area

Total Dust Aerosol Monitor	> 0.100 mg/m^3 above BKD (steady state condition) at perimeter of AOC zone for 15-minutes or visible dust.	Stop Work / Implement dust control / Continue dust monitoring if dust levels are less than 150 mg/m3
	< 0.150 mg/m3 above BKD (following dust suppression measures)	Stop Work / implement dust control, continue work once levels are <150 mg/m3
	>5 mg/m3	Level C

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 vinyl chloride for any 15-minute period.
3. 150 ppm level based on NIOSH Immediately Dangerous to Life and Health (IDLH) for tetrachloroethylene

TABLE 5
PERSONAL PROTECTIVE EQUIPMENT
12096 FLATLANDS AVENUE SITE
BROOKLYN, NEW YORK

Respiratory Protection*:*

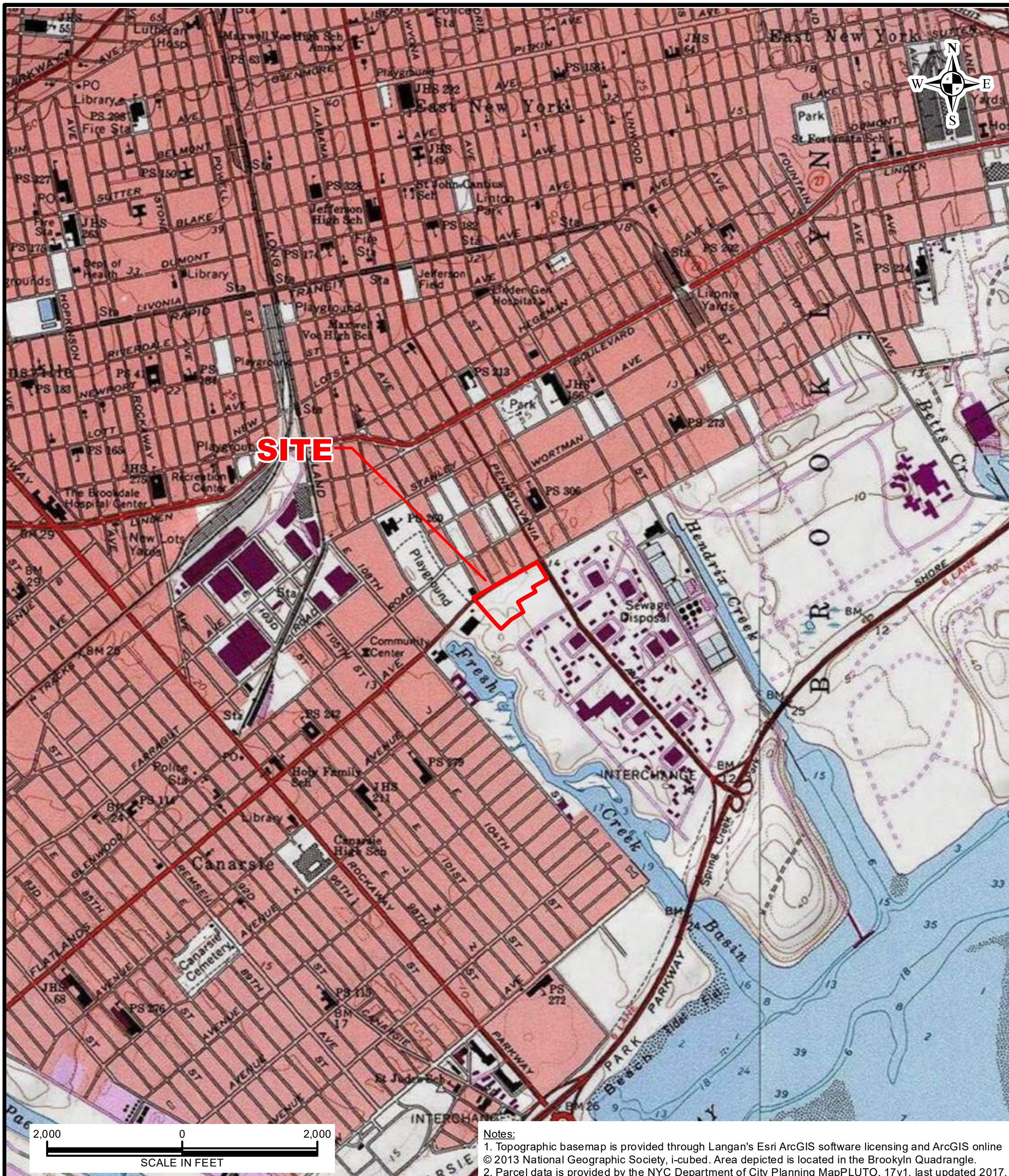
Level D:	No respirator required.
Level C:	Half-face, Air Purifying Respirator (APR) with combination HEPA (dusts, fumes, aerosols) and organic vapor cartridges. The respirator will be NIOSH-approved.
Level C - supplemental by task	Fullface, Air Purifying Respirator (APR) with combination HEPA (dusts, fumes, aerosols), acid gas, organic vapor cartridges. The respirator will be NIOSH-approved.

Personal Protective Clothing*:*

Level D:	Hard-hat, traffic vest (if working on or adjacent to the roadway), long sleeve work shirt & work pants of natural fibers, safety glasses or goggles, steel-toed boots, hearing protection (if needed), nitril inner gloves and leather outer gloves.
Level D - supplemental PPE by task	Tyvek disposal suit
Level C:	Chemically resistant outer boots and Chemical resistant Tyvek disposal suite.

\\LANGAN.COM\DATA\PAR\DATA8\100688801\HEALTH AND SAFETY\HASP\2022-09 - PHASE IA LOT 10 CHASP\TABLES\HASP TABLE 5 - PPE.DOC

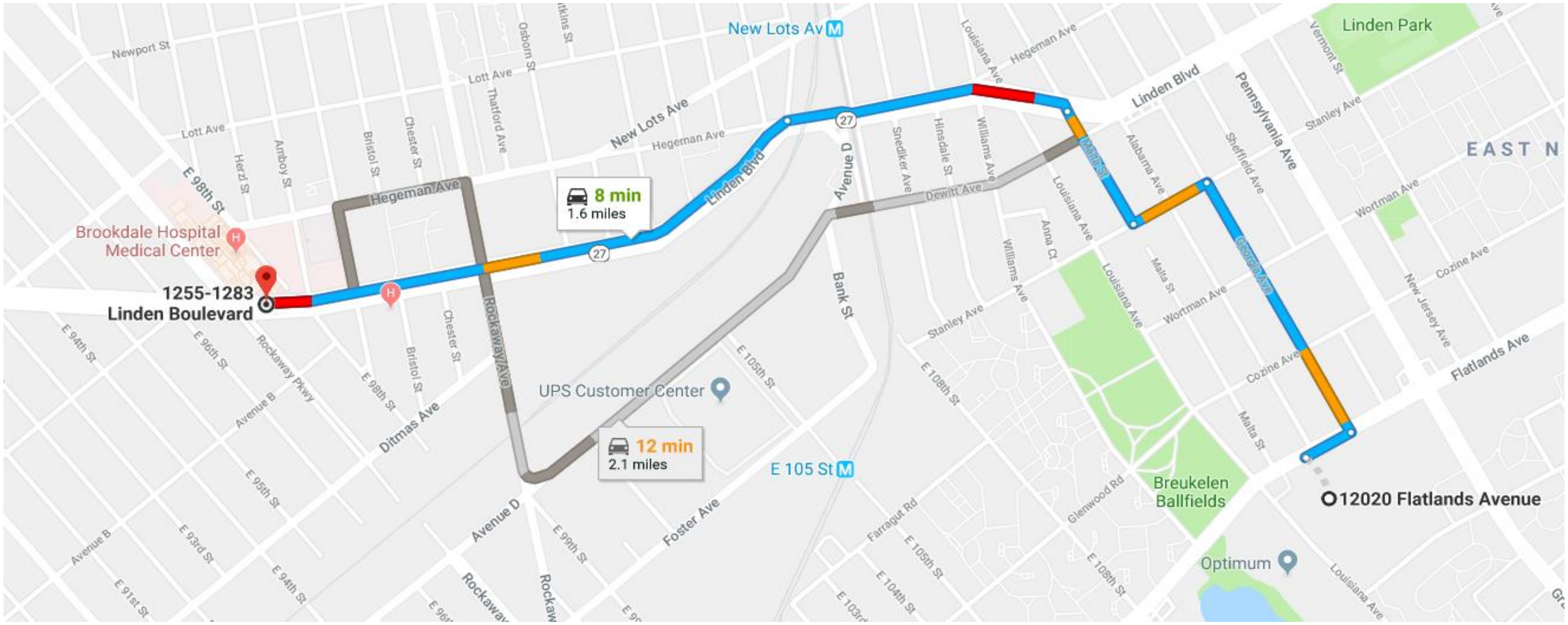
FIGURES



Notes:
1. Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2013 National Geographic Society, i-cubed. Area depicted is located in the Brookyln Quadrangle.
2. Parcel data is provided by the NYC Department of City Planning MapPLUTO, 17v1, last updated 2017.

LANGAN	Project	Drawing Title	Project No.	Figure
300 Kimball Drive Parsippany, NJ 07054 T: 973.560.4900 F: 973.560.4901 www.langan.com Langan Engineering & Environmental Services, Inc. Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. Langan International LLC Collectively known as Langan **NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400**	12020 FLATLANDS AVENUE BLOCK No. 4430, LOT No. 1 BLOCK No. 4431, LOT No. 1, 200 BLOCK No. 4432, LOT No. 1 BLOCK No. 4434, LOT No. 1 BROOKLYN KINGS COUNTY NEW YORK	SITE LOCATION MAP	100688801 Date 4/5/2018 Scale 1 " = 2,000 ' Drawn By AB Last Revised 4/5/2018	1

Path: \\langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2018-04 - HASP\Site Location Map.mxd Date: 4/5/2018 User: abakhtin Time: 2:06:18 PM



Emergency Route to Brookdale University Hospital (Phone # (718) 240-5363) :

1 Head northeast on Flatlands Avenue toward Alabama Avenue
2 Turn Left on Georgia Avenue
3 Turn Left on Stanley Avenue
4 Turn Right on Malta Street
5 Turn Left on Linden Blvd
6 Follow Linden Blvd and arrive at Emergency Room located on right hand side of Linden Blvd

MAP REFERENCE: Google Maps

LANGAN

Project

12020 Flatlands Avenue
EMERGENGY HOSPITAL ROUTE MAP

Brooklyn **New York**

Project	DATE	SCALE	FIGURE NO.
100688801	**4/5/2018**	**NTS**	**2**

ATTACHMENT A

Health and Safety Briefing Statement

ATTACHMENT A

HEALTH AND SAFETY BRIEFING STATEMENT

The following personnel were present at a pre-job safety briefing conducted at __________(time) on ______________ (date) at ______________________________(location), and have read this Health and Safety Plan for the above Site and are familiar with its provisions:

Name	Signature

Fully charged ABC class fire extinguisher available on Site? ___________

Fully stocked First Aid Kit available on Site? ___________

All project personnel advised of location of nearest phone? ___________

All project personnel advised of location of designated medical facility? ___________

____
Name of Field Team Leader or Site Safety Officer

____
Signature Date

ATTACHMENT B

Field Procedures Change Authorization Form

ATTACHMENT B

FIELD PROCEDURES CHANGE AUTHORIZATION FORM

Section to be changed:____

Duration of Authorization Requested   Date:______________________________

________ Today only

________ Duration of Task

________ Other____

____

____
Description of Procedures Modification:

____

____

____

Justification:

______________________________	______________________________
Person Requesting Change	Verbal Authorization Received From:
______________________________	______________________________
Name	Name Time
______________________________	______________________________
Title	Title
______________________________	
Signature	

Approvals:

____

____

____

ATTACHMENT C

Unsafe Conditions and Practices Form

ATTACHMENT C

UNSAFE CONDITIONS AND PRACTICES FORM

DESCRIPTION OF CIRCUMSTANCES REGARDING UNSAFE CONDITION OR PRACTICE:

____

____

____

____

____

____

____

IS THIS CONDITION EXISTING OR POTENTIAL?______________________________

REPORTED TO: ____

REPORTED BY:____

DATE REPORTED:____

COMMENTS:____

____

____

ATTACHMENT D

Calibration Log

ATTACHMENT D

PROJECT:_____________

DATE:________________

CALIBRATION LOG

Time	Inst Type	Inst #	Media	Initial Reading	Span #	Calib Reading	Performed By:

ATTACHMENT E

NYSDEC DER-10 CAMP

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

Overview

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

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

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

Community Air Monitoring Plan

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

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

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

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

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

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

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

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

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

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

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

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

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

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

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

ATTACHMENT F

Emergency Notification Numbers

ATTACHMENT F

EMERGENCY NOTIFICATION NUMBERS

The following list provides names and telephone numbers for emergency contact personnel.

ORGANIZATION	CONTACT	TELEPHONE
New York City Police		911
New York City Fire		911
Brookdale University Hospital		718-240-5363
WorkCare (Non-Emergency Medical Treatment)		1-888-449-7787
Langan Incident/Injury Hotline		973-560-4699
Langan Project Manager	Amanda Forsburg	973-560-4574
CHEMTREC	(US) (worldwide)	800-262-8200 703-741-5500
TSCA HOTLINE		202-554-1404
RCRA HOTLINE		800-424-9346
CDC	 (regional poison control)	800-232-4636 800-222-1222
BUREAU OF ALCOHOL, TOBACCO & FIREARMS	 (local)	800-800-3855 202-648-7777
NATIONAL RESPONSE CENTER		800-424-8802
PESTICIDE INFORMATION SERVICE		800-858-7378
BUREAU OF EXPLOSIVES, A.A. RAILWAYS	 (Support Services)	202-639-2265 719-584-7151
FEDERAL EXPRESS - HAZARDOUS MATERIAL INFO		800-463-3339 *call and say 'Hazardous Materials'

ATTACHMENT G

Accident / Incident Report Form

ATTACHMENT G

INCIDENT REPORT

LANGAN EMPLOYEE EXPOSURE/INJURY INCIDENT REPORT
(Submit a Separate Report for Each Employee and/or Incident)

Date: ______________________

Employee's Name:______________________________________ Employee No:________________

Sex: M _____ F _____ Age: ______

Region: ____ Location:____________________

Project: ____ Project No: __________________

Incident:____

Type: Possible Exposure ______ Exposure _______ Physical Injury ______

Location: ____

Date of Incident: ____________________________ Time of Incident: ________________________

Date of Report Incident: ____

Person(s) to Whom Incident was Reported: ____

Weather Conditions During Incident: Temperature _________ Humidity _________

Wind Speed and Direction: ______________________ Cloud Cover: ___________________________

Clear: ______________________________________ Precipitation: ___________________________

Materials Potentially Encountered: ____

Chemical (give name of description - liquid, solid, gas, vapor, fume, mist):

____

____

Radiological:____

Other: ____

Nature of the Exposure/Injury: (State the nature of the exposure/injury in detail and list the parts of the body affected. Attach extra sheets if necessary).

____

____

____

____

____

Did you receive medical care? Yes ________ No ________ If so, when ________________________

Where? On-Site _________________ Off-Site ________________

By Whom: Name of Paramedic: ____

Name of Physician: ____

Other: ____

If Off-Site, name facility (hospital, clinic, etc):__________________________________

____

Length of stay at the facility?____

Was the Site Safety Officer contacted? Yes ________ No ________ When?__________

Was the Corporate Health and Safety Officer contacted? Yes ________ No ________

If so, who was the contact?____

Did the exposure/injury result in permanent disability? Yes _________ No _________

If so, explain:____

____

____

____

Has the employee returned to work? Yes _________ No _________

List the names of other persons affected during this incident:

____

____

____

____

____

____

____

List the names of persons who witnessed the exposure/injury incident:

Possible cause of the exposure/injury incident: ____

What was the name and title of the field team leader or immediate supervisor at the site of the incident?

Was the operation being conducted under an established Health and Safety Plan?

Yes __________ No ___________ If yes, attach a copy. If no, explain

Describe protective equipment and clothing used by the employee:

Did any limitations in safety equipment or protective clothing contribute to or affect exposure? If so, explain:

What was the employee doing when the exposure/injury occurred? (Describe briefly as Site Reconnaissance, Site Characterization, or Sampling, etc.):

____
____
____
____

Where exactly on site or off site did the exposure/injury occur?

____
____
____
____
____

How did the exposure/injury occur? (Describe fully what factors led up to and/or contributed to the incident):

____
____
____
____
____

Name of person(s) initiating report, job title, phone number:

____
____
____

______________________________________ ____________________

Employee Signature Date

______________________________________ ____________________

Site Safety Officer Signature or Field Team Leader Signature Date

ATTACHMENT H

Safety Data Sheets
(SDS)

ATTACHMENT H

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 I

Jobsite Safety Inspection Checklist

LANGAN

JOBSITE SAFETY INSPECTION CHECKLIST

Client: ______________________________ Inspection Date: ________________________

Site: ________________________________ Inspector: ______________________________

Employees: ____

Notes:____
____
____

Check one of the following: **A:** Acceptable **NA**: Not Applicable **D**: Deficiency

	A	NA	D	Remarks
GENERAL				
Appropriate PPE being worn by Langan employees and subcontractors?				
Air monitoring instruments calibrated daily and results recorded on the Daily Instrument Calibration check sheet?				
Air monitoring readings recorded on the air monitoring data sheet/field log book?				
Incident reporting procedures known?				
Site security an issue?				
Vehicle /pedestrian traffic issue?				
Adequate size/type fire extinguisher supplied?				
Evidence that drilling operator is responsible for the safety of his rig.				
First Aid kit available?				
PERSONAL PROTECTIVE EQUIPMENT				
Eye Protection?				
Head protection?				
Safety Shoes?				
Safety vests?				
Hand protection?				
Other?				
Deficiencies??				
HOUSEKEEPING				
Work area kept clean/tidy to minimize potential hazards?				
Waste being disposed of quickly and properly				
Adequate lighting for job?				
Portable water available?				
HAND TOOLS				
Are tools in good condition and properly used? (INSPECT)				
Are proper tools being used?				
Are tools safety stored when not in use?				
Have tools been inspected prior to use?				
Are employees familiar with using tools?				
Is additional PPE required for tools? Available?				
POWER TOOLS				
Are tools in good condition and properly used? (INSPECT)				
Are tools properly grounded?				
Safety guards in place and used correctly?				
Competent instruction / supervision?				
Cords include in inspection?				

HAZWOPER				
Employees have current 40-hr./8-hr./Supervisor HAZWOPER training?				
Project staff medically cleared to work in hazardous waste sites and fit-tested to wear respirators, if needed?				
Respiratory protection readily available?				
Subcontract workers have current 40-hr./8-hr./Spvsr. HAZWOPER training, as appropriate?				
Subcontract workers medically cleared to work on site, and fit-tested for respirator wear?				
Subcontract workers have respirators readily available?				
HEALTH & SAFETY PLAN				
HASP available on site for inspection?				
Health & Safety Compliance agreement (in HASP) appropriately signed by Langan employees and subcontractors?				
Hospital route map with directions posted on site?				
Emergency Notification List posted on site?				
Personnel trained in CPR/First Aid on site?				
MSDSs readily available, and all workers knowledgeable about the specific chemicals and compounds to which they may be exposed?				
Project site safe practices ("Standing Orders") posted?				
Health & Safety Incident Report forms available?				
Decontamination procedures being followed as outlined in HASP?				
UNDERGROUND UTILITY				
Mark outs of underground utilities done prior to initiating any subsurface activities?				
Underground utilities located and authorities contacted before digging?				
Visually observed mark-outs?				
Is subsurface work within three feet of underground utilities?				
- Is so, is or was soft dig techniques used?				
Drilling performed in areas free from underground utilities?				
EXCAVATION / TRENCH				
Are excavations/trenches over 5 feet deep sloped, shored or a trench box used?				
Operations supervised by a Competent Person?				
Is Competent Person preforming daily inspections of excavation/trench?				
Adequate barricades in place?				
Have underground utilities been identified?				
Ladders / means of egress in trench with 25-foot of every worker?				
Has PE designed or approved protective system?				
Excavated material and other objects placed more than 2 feet away from excavation edge?				
Public protected from exposure to open excavation?				
CONFINED / PERMIT-ENTRY CONFINED SPACE				
People entering the excavation regarding it as a permit-required confined space and following appropriate procedures?				
Confined space entry permit is completed and posted?				
All persons knowledgeable about the conditions and characteristics of the confined space?				
All persons engaged in confined space operations have been trained in safe entry and rescue (non-entry)?				
Full body harnesses, lifelines, and hoisting apparatus available for rescue needs?				
Attendant and/or supervisor certified in basic first aid and CPR?				
Confined space atmosphere checked before entry and continuously while the work is going on?				
Results of confined space atmosphere testing recorded?				
Evidence of coordination with off-site rescue services to perform entry rescue, if needed?				
ELECTRICAL SAFETY				
Equipment at least 10 feet from overhead power lines?				
Is equipment grounded?				
GFCI used and tested where required?				
Are extension cords rated for this work being used and are they properly maintained?				
Electrical dangers posted at site?				

FLAMMABLE LIQUIDS				
Are flammable liquids used at site?				
Are flammable liquids stored in appropriate containers?				
Are flammable liquids kept away from combustion sources?				
Do flammable liquid containers have warning labels?				

LADDERS				
Are ladders used at site?				
Were ladders inspected prior to use?				
Are ladders in good working condition?				
Are ladders secured to prevent slipping, sliding or falling?				
Do side rails extend three feet above top of landing area?				
Are top two steps of stepladders being used?				
Is extension on ladder facing out?				
Are ladders sufficient for task?				
Are ladders sufficient for task?				

Unsafe acts observed? ____

____
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____
____

Additional remarks ____

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____
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____
____

Notes:____

____
____
____
____
____
____

Distribution: Project Manager - Name: ___________________________
Health & Safety Officer - Name: ___________________________
Health & Safety Manager- Name: Anthony Moffa, CHMM

Q:\Other\HealthandSafety\GenericAppendixAJobsiteSafetyInspectionChecklist

ATTACHMENT J

Langan Guidelines

ATTACHMENT J

Langan Guidelines

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.

APPENDIX E

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN

for

12096 FLATLANDS AVENUE SITE
Brooklyn, New York
NYSDEC BCP Site No. C224290

Prepared For:

Innovative Urban Living, LLC
c/o Gotham Organization, LLC
432 Park Avenue South, Second Floor
New York, New York 10016

Prepared By:

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
300 Kimball Drive
Parsippany, New Jersey 07054

October 2022
100688801

LANGAN

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1.0 PROJECT DESCRIPTION

1.1 Introduction

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) has prepared this Quality Assurance Project Plan (QAPP) on behalf of Innovative Urban Living, LLC (the Applicant) for the 12096 Flatlands Avenue Site (Tax Block 4434, Lot 10) in the East New York neighborhood of Brooklyn, New York (the Site). A Site Location Map is included as Figure 1.

This QAPP specifies analytical methods to be used to ensure that data collected during the Remedial Action (RA) are precise, accurate, representative, comparable, complete, and meet the sensitivity requirements of the project.

1.2 Project Objectives

The Remedial Action Work Plan (RAWP) covers earthwork to be completed during construction of the proposed development at the site. A Construction Health and Safety Plan (CHASP) and Community Air Monitoring Plan (CAMP) for the protection of on-site workers, the community, and the environment has been developed and will be implemented during remediation and construction activities. These objectives have been established in order to meet standards that will protect public health and the environment for the site.

This QAPP addresses sampling and analytical methods that will be necessary in support of remedial activities. 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 endpoint sampling that will occur during implementation of the RAWP. The RAWP requires collection of endpoint soil samples to verify performance of the remedy. The selected remedy will include the following elements:

- Development and implementation of a CHASP and CAMP for the protection of on-Site workers, community/residents, and the environment during remediation and construction activities.

- Construction of the support of excavation (SOE) system to facilitate the Track 1 remediation.
- Dewatering in compliance with city, state, and federal laws and regulations. Extracted groundwater will be managed under a permit from NYCDEP/NYSDEC that will be required to meet effluent limitations prior to discharge to the sewer system.
- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations.
- Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work.
- Excavation, stockpiling, off-Site transport, and disposal of soil that exceeds Unrestricted Use SCOs as defined by 6 NYCRR Part 375-6.8 from ground surface to between 15 to 22.5 feet bgs to remove known elevated concentrations of semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides exceeding the Unrestricted Use SCOs at various locations throughout the Site footprint. Any source material below a depth of 15 feet below street level will be removed to the extent feasible.
- Appropriate off-Site disposal of material removed from the Site in accordance with federal, state and local rules and regulations for handling, transport, and disposal.
- Removal and decommissioning of any encountered underground storage tanks (USTs) and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and disposal off-Site during Site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Collection and analysis of confirmation endpoint soil samples from the excavation base and sidewalls of the excavation, in accordance with DER-10 to confirm Track 1 SCOs were achieved; over-excavation may be completed if feasible to meet the Unrestricted Use SCOs.
- Importation and backfilling of remediated areas, as necessary for development, with certified-clean material (meeting Track 1 SCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone to backfill areas excavated deeper than the development depth.

- Installation of a vapor barrier membrane below the slab of the proposed building and along sidewalls of any subgrade foundation elements beneath occupied spaces as a green remediation component.
- All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

2.0 DATA QUALITY OBJECTIVES AND PROCESS

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 soil associated with the contaminated fill. 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 quality assurance/quality control (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.
- 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.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

Implementation of the RAWP will be overseen by Langan for Innovative Urban Living, LLC. The environmental consultant will also arrange data analysis and reporting tasks. The analytical services will be performed by an Environmental Laboratory Approval Program (ELAP)-certified laboratory. Data validation services will be performed by approved data validation contractor(s).

For the required sampling as stated in the RAWP, sampling will be conducted by Langan, the analytical services will be performed by York Analytical Laboratories, Inc. of Stratford, CT. (New York State Department of Health [NYSDOH] ELAP certification number 10854). Data validation services will be performed by Joseph Conboy; résumé attached (Attachment A).

Key contacts for this project are as follows:

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Langan Project Manager:	Amanda Forsburg Telephone: (973) 560-4900
Langan Quality Assurance Officer (QAO):	Steve Ciambruschini Telephone: (973) 560-4900
Langan Remedial Engineer:	Ron Boyer Telephone: (973) 560-4900
Program Quality Assurance Monitor:	Lauren Kott Telephone: (973) 560-4900
Data Validator:	Joseph Conboy Telephone: (215) 845-8985
Laboratory Representative:	York Analytical Laboratories, Inc. Phil Murphy Telephone: (203) 598-1371

4.0 QUALITY ASSURANCE OBJECTIVES FOR COLLECTION OF DATA

The overall quality assurance objective is to develop and implement procedures for sampling, laboratory analysis, field measurements, and reporting that will provide data of sufficient quality to evaluate soil impacts at the site. The sample set, chemical analysis results, and interpretations must be based on data that meet or exceed quality assurance objectives established for the site. Quality assurance objectives are usually expressed in terms of accuracy or bias, sensitivity, completeness, representativeness, comparability, and sensitivity of analysis. 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.

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 <30% (groundwater). RLs and method detection limits (MDL) are provided in Attachment B.

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 interferences, 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 was evaluated against laboratory blanks (preparation or method) and evaluated against field samples collected on the same day to determine potential for bias.

Laboratory accuracy is assessed by evaluating the percent recoveries of MS/MSD samples, LCS/LCSDs, surrogate compound recoveries, internal standard responses and the results of method preparation blanks. MS/MSD, LCS/LCSD, internal standard responses and surrogate percent recoveries were 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.

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 and groundwater 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.

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 was 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 will be 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 EPA and standard methods, laboratory-issued SOPs, the laboratory's Quality Assurance Manual, and this QAPP. The laboratory is required to be properly certified and accredited.

Comparability

Comparability is an expression of the confidence with which one data set can be compared to another. Comparability is dependent upon the proper design of the sampling program and was satisfied by ensuring that the sampling plan is followed and that sampling is performed according to the SOPs or other project-specific procedures. Analytical data were comparable when similar sampling and analytical methods are used as documented in the QAPP. Comparability was controlled by requiring the use of specific nationally-recognized analytical methods and requiring consistent method performance criteria. Comparability is also dependent on similar quality assurance objectives. Previously collected data were evaluated to determine whether they may be combined with contemporary data sets.

Sensitivity

Sensitivity is the ability of the instrument or method to detect target analytes at the levels of interest (e.g., at the NYSDEC Subpart 375-6 Soil Cleanup Objectives). The Project Manager 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 Manager 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. The concentration of the lowest level check standard in a multi-point calibration curve will represent the reporting limit.

Analytical methods and quality assurance parameters associated with the sampling program are presented in Attachment C. The frequency of associated field blanks and duplicate samples will be based on the recommendations listed in DER-10 and as described in Section 5.3.2.

5.0 SAMPLE COLLECTION AND FIELD DATA ACQUISITION PROCEDURES

Soil sampling will be conducted in accordance with the established NYSDEC protocols contained in DER-10/Technical Guidance for Site Investigation and Remediation (May 2010). The following sections describe procedures to be followed for specific tasks.

5.1 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.

5.1.1 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 were made in waterproof, permanent blue or black ink. No erasures will be allowed. Incorrect entries 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 were 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.; and,
- 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.

5.1.2 Sample Labeling

Each sample collected will be assigned a unique identification number 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. Sample nomenclature procedures are included in Attachment D.

5.2 Equipment Calibration and Preventative Maintenance

A photoionization detector (PID) will be used during the sampling activities to evaluate work zone action levels and screen soil samples. 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.

5.3 Sample Collection

5.3.1 Soil Samples

Endpoint soil samples will evaluate soil to verify performance of the remedy. Endpoint soil samples will be collected from the excavation base at a frequency of one per 5,000 square feet in accordance with the RAWP. Sidewall samples will not be collected from the site perimeter because excavation will extend across the site footprint and SOE measures (e.g., sheeting and lagging) will preclude access to soil sidewalls. An estimated 14 endpoint soil samples, plus QA/QC samples, will be collected to confirm remedial performance and will be analyzed for the full TAL/TCL of VOCs, SVOCs, PCBs, pesticides/ herbicides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane. No off-Site excavation will be required. Additional endpoint samples will be collected as follows:

- In the location of unidentified USTs, if the remedial or development excavation depth does not extend beyond the bottom of the encountered tank, five endpoint samples will be collected from each excavation and will consist of one sample per excavation sidewall and a sample from each excavation base. As necessary, post removal soil samples will be collected in accordance with the requirements of CP-51. Samples will be analyzed for CP-51 List VOCs and SVOCs and compared to the CP-51 Table 2 Soil Cleanup Levels for Gasoline Contaminated Soils or Table 3 Soil Cleanup Levels for Fuel Oil Contaminated Soil and the 6 NYCRR Part 375-6.8(a) Unrestricted Use SCOs, depending on the contents of the USTs.

  If the remedial or development excavation depth does extend beyond the bottom of the encountered tank, a post-excavation base endpoint soil sample will be biased to the tank's location when collected upon completion of Site excavation.

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 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 C. In addition, analysis of collected soil sample will meet all quality assurance criteria set forth by this QAPP and DER-10.

Soil samples analyzed for per- and poly-fluoro alkyl substances (PFAS) will be collected in 250-milliliter (mL) high-density polyethylene (HDPE) containers provided by the laboratory and analyzed by using Modified USEPA Method 537.1. The reporting limit for PFAS in soil is 0.5 microgram per kilogram (ug/kg). The laboratory standard operating procedures (SOP) for the analysis of PFAS is included in Attachment E. Soil samples analyzed for 1,4-dioxane will be collected in an 8 ounce jar provided by the laboratory and analyzed using USEPA Method 8270. The reporting limit for 1,4-dioxane in soil is 0.1 milligram per kilogram (mg/kg).

5.3.1.1 Sample Field Blanks and Duplicates

Use of dedicated sampling equipment is planned; therefore, collection of field blanks is not anticipated. If the use of reusable sampling equipment is required, proper decontamination procedures will be employed (as further described in Section 5.7) and field blanks will be collected for quality assurance purposes at a rate of one per 20 investigative soil samples. If required, field blanks will be obtained by pouring laboratory-demonstrated analyte-free water on or through a decontaminated sampling device following use and implementation of decontamination protocols. The water will be collected off of the sampling device into a laboratory-provided sample container for analysis. Field blanks will be collected at a rate of one per 20 samples and will be analyzed for the complete list of analytes on the day of sampling. If less than 20 samples are collected during a particular sampling event, one field blank sample will be collected. Equipment blanks will be collected at a rate of one per day when soil samples are analyzed for PFAS. Trip blanks will be collected at a rate of one per day if soil samples are analyzed for VOCs during that day.

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 soil samples 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. If less than 20 samples are collected during a particular sampling event, one MS/MSD sample will be collected. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes.

5.3.2 Groundwater Samples

Groundwater sampling is not anticipated during remedial activities. In the event that groundwater sampling is required, groundwater samples will be collected into laboratory-supplied containers and will be sealed, labeled, and placed in a cooler containing ice (to maintain a temperature of approximately 4 degrees Celsius) for delivery to a NYSDOH ELAP-certified analytical laboratory. Analysis and/or extraction and digestion of collected groundwater samples will meet the holding times required for each analyte as specified in Attachment C. In addition, analysis of collected groundwater samples will meet all quality assurance criteria set forth by this QAPP and DER-10.

Groundwater samples analyzed for PFAS will be collected in two 250-mL HDPE containers provided by the laboratory and analyzed using USEPA Method 537 modified. The reporting limit for PFAS in groundwater is 2 nanograms per liter (ng/L). The laboratory SOP for the analysis of PFAS is included in Attachment E. Groundwater samples also be analyzed for 1,4-dioxane will be collected in a one-liter amber glass jar and analyzed using USEPA Method 8270 SIM. The reporting limit for 1,4-dioxane in groundwater is 0.35 micrograms per liter (ug/L).

5.3.2.1 Sample Field Blanks and Duplicates

Field blanks will be collected for quality assurance purposes at a rate of one per 20 groundwater samples and will be analyzed for the complete list of analytes on the day of sampling. Field blanks will be obtained by pouring laboratory-demonstrated analyte-free water on or through a decontaminated sampling device following use and implementation of decontamination protocols. The water will be collected off of the sampling device into a laboratory-provided sample container for analysis. If less than 20 samples are collected during a particular sampling event, one field blank sample will be collected. Equipment blanks will be collected at a rate of one per day when groundwater samples are analyzed for PFAS. Trip blanks will be collected at a rate of one per day if groundwater samples are analyzed for VOCs during that day.

Duplicate groundwater samples will be collected and analyzed for quality assurance purposes. Duplicate samples will be collected at a frequency of 1 per 20 investigative soil samples 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.

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. If less than 20 samples are collected during a particular sampling event, one MS/MSD sample will be collected. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes.

5.3.3 Soil Vapor Samples

Soil vapor sampling is not anticipated during remedial activities. In the event that soil vapor sampling is required, samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH October 2006). Soil vapor implants will be set at a depth of approximately 14-feet below current site grades which corresponds to the depth interval directly below the proposed development excavation depth. Each vapor probe will consist of a new, dedicated stainless steel screen implant connected to polyethylene or Teflon™ tubing extending to the target depth. About 1 foot of clean sand filter pack will be placed around the screen implant, and the remaining annular space will be backfilled to grade with hydrated bentonite. Sampling will occur for the duration of 2 hours.

Samples will be collected in appropriate sized Summa canisters that have been certified clean by the laboratory and samples will be analyzed by using USEPA Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 L/min. 24-hours following soil vapor probe installation, one to three implant volumes shall be purged prior to the collection of any soil-gas samples. A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of the sampling zone, and chain of custody protocols.

As part of the vapor intrusion evaluation, a tracer gas will be used in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) device to verify the integrity of the soil vapor probe seal. A container (box, plastic pail, etc.) will serve to keep the tracer gas in contact with the probe during testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer gas prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration. At the conclusion of the sampling round, tracer monitoring will be performed a second time to confirm the integrity of the probe seals.

5.3.3.1 Soil Vapor Sample Duplicates

Duplicate soil vapor samples will be collected and analyzed for quality assurance purposes. Duplicate samples will be collected at a frequency of 1 per 20 investigative soil samples 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.

5.3.4 PFAS Sampling Procedures

Soil sampling for PFAS analysis will be completed during the remedial action. All 14 endpoint soil samples collected during the proposed sampling event will be analyzed for PFAS. Field personnel conducting PFAS sampling will wear clothing and use equipment which does not contain PFAS materials including: powderless nitrile gloves, natural rubber overboots, and synthetic and natural fiber clothing. Clothing advertised as waterproof, water-repellant, and/or dirt and/or stain resistant will not be worn. Personal hygiene products with conditioning agents will be avoided prior to the sampling event. Insect repellent and sunscreen will be avoided. Consumption of food and/or beverages will be strictly prohibited during sampling activities, excluding bottled water for hydration. Ballpoint pens will be used as the sole writing instrument to complete labels and record field notes. Waterproof field books, including "Rite-in-Rain"™ will be avoided.

Only sampling equipment known to be devoid of PFAS containing materials will be used. Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. In general, PFAS-free pumps, tubing, interface probes, soil sampling equipment, and bottleware will be considered prior to the sampling event. It is not anticipated that groundwater samples will be collected for PFAS analysis; however, if required, peristaltic pumps will be utilized as the depth of groundwater is less than 20-feet. If groundwater is determined to be greater than 20 feet deep, bladder pumps (QED Sample Pro, or equivalent) with a fluoropolymer-free bladder will be used. HDPE will be used for tubing, soil sampling equipment, and bottleware.

Field personnel will follow standard discrete soil sampling and low flow procedures when sampling for PFAS. When possible, disposable and dedicated equipment will be used for each sample location to avoid potential cross contamination and limit errors from inadequate decontamination between samples. Bladder pumps and/or peristaltic pump tubing will not be re-used and therefore decontamination of sampling equipment between samples will not be necessary. Nitrile gloves will be changed between each step during set up and sampling.

When sampling for PFAS, 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 plumbers tape and sample bottle cap liners with a PTFE layer.

Whenever an action occurs outside of procedure, such as the writing of field notes, nitrile gloves will be changed. Sampling equipment will be staged 5-feet away from the boring or open wellhead. Equipment not directly related to sampling will be staged in a separate area away from the boring or open wellhead. When inserting the tubing into the well, the surrounding platform will be avoided as a source of transference. While stabilizing the well, the pump will not be allowed to stop as backflow from the water quality meter can pose a risk to cross contamination. Once stability has been achieved, sampling will occur. PFAS sample bottleware must be made of HDPE and bottleware must be filled to the container neck. Soil sample bottleware must only be filled half-way. The PFAS field and equipment blanks will be collected immediately following completion of PFAS sampling at the frequency discussed above (Sections 5.3.1.1 and 5.3.2.1).

The PFAS compounds to be analyzed includes: perfluorobutanesulfonic acid, perfluorohexanesulfonic acid, perfluoroheptanesulfonic acid, perfluorooctanessulfonic acid, perfluorodecanesulfonic acid, perfluorobutanoic acid, perfluoropentanoic acid, perfluorohexanoic acid, perfluoroheptanoic acid, perfluorooctanoic acid, perfluorononanoic acid, perfluorodecanoic acid, perfluoroundecanoic acid, perfluorododecanoic acid, perfluorotridecanoic acid, perfluorotetradecanoic acid, 6:2 fluorotelomer sulfonate, 8:2 fluorotelomer sulfonate, perfluroroctanesulfonamide, n-methyl perfluorooctanesulfonamidoacetic acid, and n-ethyl perfluorooctanesulfonamidoacetic acid.

5.4 Sample Containers and Handling

Certified, commercially clean sample containers will be obtained from the analytical laboratory. The laboratory will also prepare and supply the required field blank sample containers and reagent preservatives. Sample containers, including the field blank containers, will be placed in 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 regular ice only in Ziploc® bags (or equivalent) to maintain a temperature of 4°C±2° C.

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. The temperature in the coolers containing samples and associated field blanks will be maintained at a temperature of 4°C±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.

5.5 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 C.

5.6 Sample Shipment

5.6.1 Packaging

Sample containers will be placed in plastic coolers. Regular ice only 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 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 (third-party courier, e.g., FedEx) then laboratory address labels will be placed on top of the cooler.

5.6.2 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 from the site or Langan office by a laboratory provided courier under the chain-of-custody protocols described in Section 5.9. A third-party courier may be used if necessary.
- 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.

5.7 Decontamination Procedures

Though not anticipated, decontamination procedures will be used if non-dedicated sampling equipment is utilized during the RA. Field sampling equipment that is to be reused will be decontaminated in the field in accordance with the following procedures:

1. Laboratory-grade glassware detergent and tap water scrub to remove visual contamination
2. Generous tap water rinse
3. Distilled/de-ionized water rinse

Field sampling equipment that will be used for the collection of PFAS samples that is to be reused will be decontaminated in the field in accordance with the following procedures:

1. Laboratory-grade glassware detergent and clean, PFAS-free water scrub to remove visual contamination
2. Generous clean, PFAS-free water rinse

5.8 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.

5.9 Chain of Custody Procedures

A chain-of-custody protocol has been established for collected samples was and 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 for third-party shipping couriers, 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 samples 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. 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/Field 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/Field 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.

Samples will be packaged for shipment or pickup via courier to the laboratory with the appropriate chain-of-custody form. If applicable, a shipping bill will be completed for each cooler and the shipping bill number recorded on the chain-of-custody form. A copy of the form will be retained by the Langan 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.

Laboratory chain-of-custody will be maintained throughout the analytical processes as described in the laboratory's Quality Assurance Manual. The analytical laboratory will provide a copy of the chain-of-custody in the analytical data deliverable package. The chain-of-custody becomes the permanent record of sample handling and shipment.

5.10 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, Langan 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 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. Following analysis, the laboratory's specific procedures for retention and disposal will be followed as specified in the laboratory's SOPs and/or QA manual.

6.0 DATA REDUCTION, VALIDATION, AND REPORTING

6.1 Introduction

Data collected during the field investigation 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.

6.2 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 American Standard Code for Information Interchange (ASCII) format from the 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.

6.3 Data Validation

Data validation will be performed in accordance with the USEPA Region 2 SOPs for data validation and USEPA's National Functional Guidelines for Organic and Inorganic Data Review. Tier 1 data validation (the equivalent of USEPA's Stage 2A validation) will be performed to evaluate data quality. Tier 1 data validation is based on completeness and compliance checks of sample-related QC results including:

- Holding times;
- Sample preservation;
- Blank results (method, trip, and field blanks);
- Surrogate recovery compounds and extracted internal standards (as applicable);
- LCS and LCSD recoveries and RPDs;
- MS and MSD recoveries and RPDs;
- Laboratory duplicate RPDs; and
- Field duplicate RPDs

A DUSR will be prepared by the data validator and reviewed by the QAM before issuance. The DUSR will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

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;
- "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.

7.0 QUALITY ASSURANCE PERFORMANCE AUDITS AND SYSTEM AUDITS

7.1 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.

7.2 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.

7.3 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.

7.4 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.

8.0 CORRECTIVE ACTION

8.1 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.

8.2 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 8.1 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 8.1

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:_____________

9.0 REFERENCES

NYSDEC. Division of Environmental Remediation. DER-10/Technical Guidance for Site Investigation and Remediation, dated May 3, 2010.

NYSDEC. Division of Environmental Remediation. Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs, dated June 2021.

NYSDOH. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006 and revised May 2017.

Taylor, J. K., 1987. Quality Assurance of Chemical Measurements. Lewis Publishers, Inc., Chelsea, Michigan

USEPA, 1986. SW-846 "Test Method for Evaluating Solid Waste," dated November 1986. U.S. Environmental Protection Agency, Washington, D.C.

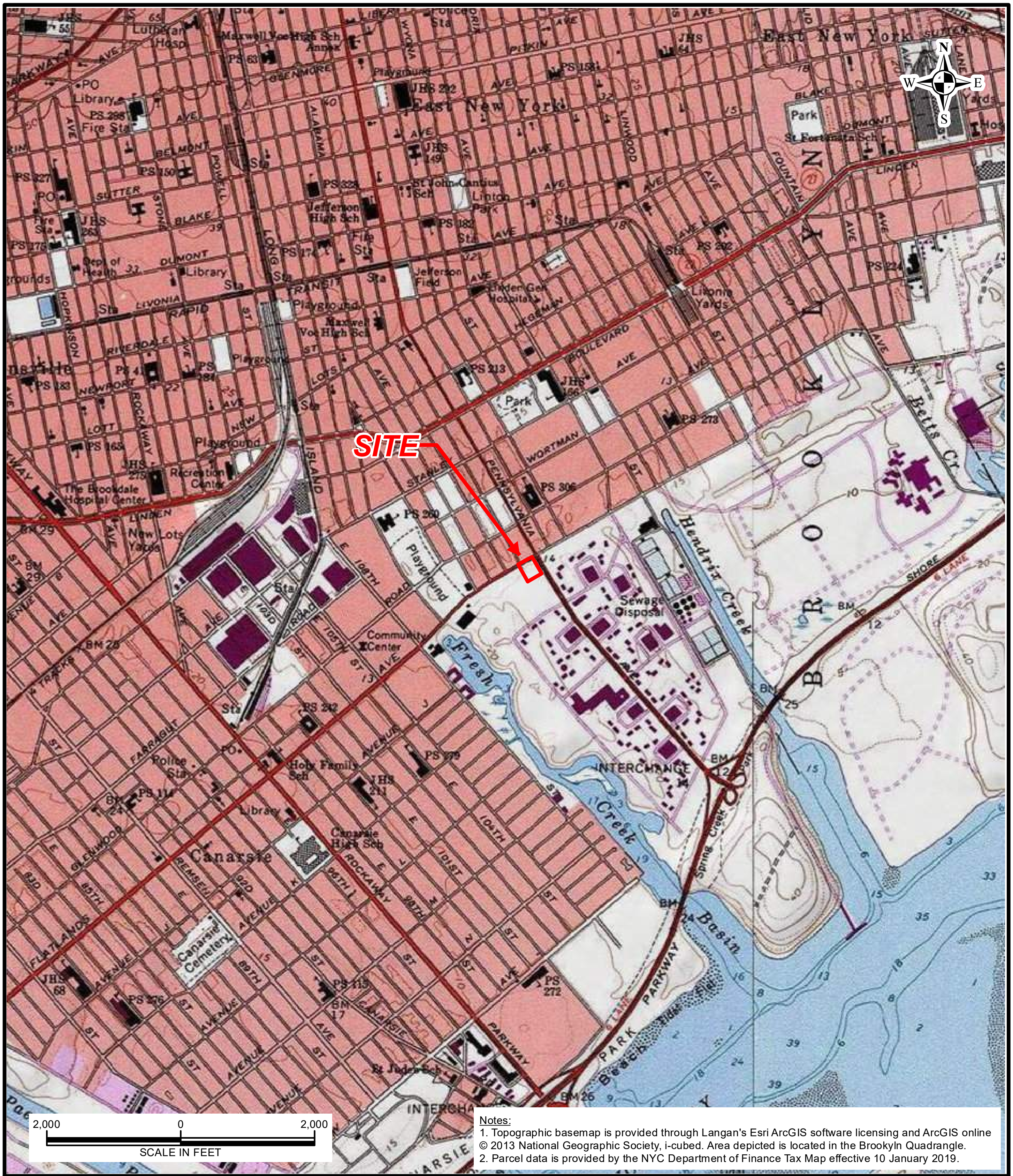
USEPA, 1987. Data Quality Objectives for Remedial Response Actions Activities: Development Process, EPA/540/G-87/003, OSWER Directive 9355.0-7 - U.S. Environmental Protection Agency, Washington, D.C.

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.

FIGURES



Notes:
1. Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2013 National Geographic Society, i-cubed. Area depicted is located in the Brookyln Quadrangle.
2. Parcel data is provided by the NYC Department of Finance Tax Map effective 10 January 2019.

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Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project	Drawing Title	Project No.	Figure
12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	SITE LOCATION MAP	Project No. 100688801 Date 6/21/2021 Scale 1"=2,000' Drawn By JR Last Revised 6/21/2021	1

References:
1. Aerial imagery provided by Nearmap ltd., collected April 8, 2018.
2. Parcel information from MapPLUTO 21v1 copyrighted by the New York City Department of Planning.

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SCALE IN FEET

LANGAN

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Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
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Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project	Drawing Title	Project No.	Figure
12096 FLATLANDS AVENUE BLOCK No. 4434, LOT No. 10 BROOKLYN KINGS COUNTY NEW YORK	PROPOSED ENDPOINT CONFIRMATION SAMPLING PLAN	100688801 Date: 9/6/2022 Scale: 1 " = 50 ' Drawn By: IHB Last Revised: 10/6/2022	2

Path: \\Langan.com\data\PAR\data8\100688801\Project Data\ArcGIS\MXD\Environmental_Figures\2022-09 RAWP\Figure 2 - Proposed Endpoint Confirmation Sampling.mxd Date: 10/6/2022 User: ibaker Time: 1:18:21 PM

ATTACHMENT A

Resumes

RONALD D. BOYER, PE

PRINCIPAL/VICE PRESIDENT

GEOTECHNICAL ENGINEERING

Mr. Boyer is an experienced geotechnical engineer whose practice involves coordination and supervision of subsurface investigations; establishment and monitoring of geotechnical instrumentation; design of shallow and deep foundation systems; evaluation of earth slope stability; design and inspection of subgrade improvement applications; preparation of geotechnical engineering reports and construction specifications; performance of pre-construction conditions documentation; coordination and supervision of construction inspection services; and monitoring of adjacent structures during demolition and construction.

SELECTED PROJECTS

- 11 Hubert Street, New York, NY
- 110 University Place, New York, NY
- 111 Murray Street Development, New York, NY
- 120 Neptune Avenue, Brooklyn, NY
- 125 Greenwich Street Development, New York, NY
- 150 Amsterdam Avenue, New York, NY
- 22 Thames Street, New York, NY
- 225 East 39th Street Development, New York, NY
- 2329 Nostrand Avenue, Brooklyn, NY
- 259 West 10th Street, New York, NY
- 315 East 46th Street, New York, NY
- 414 West 15thh Street, New York, NY
- 485 Fifth Avenue, New York, NY
- 510 West 22nd Street, New York, NY
- 57 Reade Street Development, New York, NY
- 92 Fulton Street, New York, NY
- American Dream Meadowlands, East Rutherford, NJ
- Avalon Bay, Boonton, NJ
- Bank Street Commons, White Plains, NY
- Brooklyn Law School Dormitory, Brooklyn, NY
- Cape Liberty Cruise Port, Bayonne, NJ
- CarMax - Waterbury, CT
- Christian Cultural Center, Brooklyn, NY
- Christiana Phase 2 Retail Development, Christiana, DE
- Circuit City Store, Wayne, NJ
- Clifton Commons, Clifton, NJ
- Colgate-Palmolive Waterfront Development, Various Locations
- Daily News Printing Press Facility, Jersey City, NJ
- DDC Rikers Island, New York, NY
- Essex Street Roadway Improvements, Hackensack, NJ
- Fifth Avenue Presbyterian Church, New York, NY
- General Motors - Lighthouse Landing, Sleepy Hollow, NY
- Giants Training Facility, East Rutherford, NJ
- Golden Orchards Geotechnical Support, Washington Township, NJ

EDUCATION

M.S., Civil Engineering (Geotechnical) Virginia Tech

B.S., Civil Engineering Virginia Tech

PROFESSIONAL REGISTRATION

Professional Engineer (PE) in NJ, NY

AFFILIATIONS

Deep Foundations Institute (DFI)

American Institute of Architects

Associated General Contractors of NJ

- Greenwich School, Greenwich, NJ
- Hudson County Courthouse, Jersey City, NJ
- K. Hovnanian at Bedminster Stormwater Detention System, Bedminster, NJ
- Kinko's, Norwalk, CT
- Kohl's Distribution Center, Mamakating, NY
- Lehman Brothers Data Center, Cranford, NJ
- Lehman Brothers Data Center, Piscataway, NJ
- Lowe's Norwalk, CT
- MetLife Stadium, East Rutherford, NJ
- Metropolitan Executive Towers, East Rutherford, NJ
- Morgan Stanley Data Center, Somerset, NJ
- Morristown Airport Hanger, Morristown, NJ
- MOMA West, New York, NY
- Newark International Airport, CONRac, Newark, NJ
- Newark International Airport, AirTrain Replacement, Newark, NJ
- New Britain Retail Center, New Britain, CT
- Northwest Airlines Cargo Facility, JFK International Airport, Queens, NY
- Norwalk Retail Development, Norwalk, CT
- One Bridge Plaza, Fort Lee, NJ
- PRBC - Medical Office Building, East Stroudsburg, PA
- Prospect Plaza, Brooklyn, NY
- PSEG Overhead Transmission, Throughout NJ
- River Bend at Port Imperial, West New York, NJ
- River Street Redevelopment, Hackensack, NJ
- Riverfront Stadium Redevelopment, Newark, NJ
- Riverside Square Mall Expansion, Hackensack, NJ
- Roosevelt Island DEP Seawall, New York, NY
- Roosevelt Island Park, Esplanade and Seawall, New York, NY
- Route 209 Expansion, Mamakating, NY
- Route 3 Flyover Bridge, Meadowlands, East Rutherford, NJ
- St Barnabas Hospital, Livingston, NJ
- Stevens Institute of Technology, Student Housing and University Center, Hoboken, NJ
- Stop & Shop, Various Locations
- T172 & S171N Transmission Lines, North Smithfield, RI
- Target Development, Bethel, CT
- Target Store, Horn Lake, MS
- Temporary Office Trailer Complex, East Rutherford, NJ
- The Standard, New York, NY
- The Venetian, Brooklyn, NY
- Westlakes Office Complex, Berwyn, PA
- Yonkers Avenue Bridge, Westchester County, NY

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.

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

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

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.*

MARLENA JEWETT

DATA ANALYST

CAD/GIS

1 year in the industry

Proposed Title: Field Technician

Ms. Jewett is a data analyst with experience in database design, management and visualization using EarthSoft's EQuIS™ database in support of environmental site characterizations for sites regulated under federal and state compliance programs. Her expertise includes integration of analytical databases and coordination with GIS users.

In her current role Marlena assists project teams with planning and implementation of project databases and data visualization. This includes coordinating with field staff and laboratories to define, workflows, SOPs and ensure the receipt of the proper deliverables for field and lab data; reviewing and managing project data and information using EQuIS™, Microsoft® Access, and Excel; generating data reports including tables, graphs, charts, and GIS compatible files; and generating and reviewing electronic data deliverables following project or agency specific formats.

Education

B.A., Environmental Economics
Colgate University

Work History

Equitable Advisors
Financial Advisor
9/7/2020-4/23/2021

Langan
Data Analyst
5/10/2021 – Present

SELECTED PROJECTS

EQuIS Management and NYSDEC deliverables – Data Analyst. Loaded and maintained soil, groundwater, and soil vapor data in an EQuIS database for a remedial investigation and waste characterizations of New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), NYC Office of Environmental Remediation (OER), and due diligence sites. Provided final report deliverables including sample summaries; tags; and exceedance summary exports from EQuIS. Completed this work for the following projects:

- **2-8 Main Street**
- **28-90 Review Avenue**
- **34-15 10th Street**
- **37-11 30th Street**
- **44-01 Northern Boulevard**
- **45 Commercial Avenue**
- **50 Jersey Avenue**
- **111 Willow Street**
- **118 West 13th Street**
- **122 Fifth Avenue**
- **155 Third Street**
- **160 East 125th Street**
- **210 Clarkson Avenue**
- **241 West 28th Street**
- **266 West 96th Street**
- **445 Gerard Avenue**
- **475 Bay Street and 31 Wave Street**

- **495 Peninsula Boulevard**
- **561 Greenwich Street**
- **563 Sackett Street**
- **805-825 Atlantic Avenue**
- **1525 Bedford Avenue**
- **2455 Third Avenue**
- **4650 Broadway**
- **ABC Block 27**
- **Bay Crane**
- **Broome Street**
- **Former Grant Hardware**
- **Forsyth and Delancy Street**
- **Gowanus Canal Northside**
- **Greenpoint Landing E1**
- **Greenpoint Landing Parcel H3**
- **John Evans**
- **Kissena Boulevard**
- **NYCHA Farragut**
- **Remeeder**

LAUREN KOTT, PE

SENIOR STAFF ENGINEER

ENVIRONMENTAL ENGINEERING, REMEDIAL INVESTIGATION

Ms. Kott has 9 years of experience working on environmental projects, particularly investigation and remediation of environmental contamination. She has participated in multiple phases of site remediation including site investigation, remedial investigation, and remedial action. Her experience includes sample collection and characterization of various environmental media, and preparing reports and other environmental regulatory documents.

SELECTED PROJECTS

- Passaic Gifted and Talented Academy School No 20, Passaic, NJ*
- Former GM Plant and Redevelopment, Ewing, NJ*
- The Chelsea at Greenburgh, White Plains, NY*
- Brightview Devon, Wayne, PA*
- Residential Property, New Paltz, NY*
- Former Industrial Property, Bayonne, NJ*
- Childcare Facility, Jersey City, NJ*
- Allied Concrete, Rockaway, NJ*
- Mountain Creek, Vernon, NJ*
- Frankford Firehouse, Branchville, NJ*
- Venue at Longview, Plumsted Township, NJ*
- Venue at Smithville Greene, Eastampton, NJ*
- The Collection at Morristown, Morris Plains, NJ*
- Gables at Woodcliff Lake, Woodcliff Lake, NJ*
- Mountain Ridge Development, Mt. Olive, NJ*
- Brightview Port Jefferson, Port Jefferson, NY*
- Brightview Paramus, Paramus, NJ*
- Proposed Senior Living Facility, Rockville Centre, NY*

EDUCATION

B.E., Environmental Engineering
University of Delaware

PROFESSIONAL REGISTRATION

Professional Engineer (PE) in NJ

10-Hour Construction Safety

40-Hour HAZWOPER

** Denotes experience with previous firm*

AMANDA FORSBURG, CHMM

SENIOR PROJECT SCIENTIST

BROWNFIELD REDEVELOPMENT, DUE DILIGENCE AND SITE INVESTIGATION, REMEDIAL ACTIONS

Ms. Forsburg has 14 years of experience primarily focused on providing environmental support to redevelopment sites within the metropolitan New York area. She has experience with projects in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) and Spill Programs, New York City Office of Environmental Remediation (NYCOER) E-Designated and New York City Voluntary Cleanup Program (VCP) sites, and New York City Department of Environmental Protection (NYCDEP) remediation sites. Her field experience includes implementation and management of all phases of environmental projects involving soil, groundwater, and soil vapor contamination including Phase I inspections, Phase II site investigations, Remedial Investigations, and Remedial Actions.

During her tenure at Langan, Ms. Forsburg's experience has included schematic-, design-, and construction-phase project team involvement on numerous large scale construction projects requiring multi-disciplinary coordination and collaboration across different Langan teams and offices.

SELECTED PROJECTS

- 101 Murray Street, New York, NY (NYSDEC Spill Site, Multi-discipline)
- 110 University Place, New York, NY (NYSDEC Spill Site, Multi-discipline)
- 138 Willoughby Street, Brooklyn, NY (NYCOER E-Designation Site, Multi-discipline)
- 180 East 125th Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 1905 Surf Avenue, Brooklyn, NY (NYCOER E-Designation Site, Multi-discipline)
- 1921 Atlantic Avenue, Brooklyn, NY (NYSDEC BCP Site)
- 225 East 39th Street, New York, NY (NYCDEP Remediation Site, Multi-Discipline)
- 23-30 Borden Avenue, Queens, NY (NYSDEC BCP Site, Multi-discipline)
- 28-90 Review Avenue, Queens, NY (NYSDEC BCP Site, Multi-discipline)
- 280 West 155th Street, New York, NY (NYSDEC BCP Site, Multi-discipline)
- 311 West 42nd Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 363 and 365 Bond Street, Brooklyn, NY (NYSDEC BCP Site, Multi-discipline)
- 400 Park Avenue South, New York, NY (NYCOER E-Designation and VCP Site)
- 412 Greenwich Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)

EDUCATION

B.A., Environmental Studies
Bucknell University

B.A., Environmental Geology
Bucknell University

PROFESSIONAL REGISTRATION

Certified Hazardous Materials Manager (CHMM)

OSHA 29 CFR 1910.120 Certification (HAZWOPER)

AFFILIATIONS

New Jersey Society of Women Environmental Professionals (NJSWEP) - MetroNet Committee

Association of Environmental and Engineering Geologists

Professional Women in Construction

Urban Land Institute, Norther New Jersey Chapter - Women's Leadership Initiative Co-Chair

- 42-50 24th Street, Queens, NY (NYSDEC Spill Site, Multi-discipline)
- 460 West 41st Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 505 West 19th Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 508 West 24th Street, New York, NY (NYCOER E-Designation and VCP Site, Multi-discipline)
- 525 West 52nd Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 53 West 53rd Street (MoMA Expansion), New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 54 Crown Street, Brooklyn, NY (NYCOER E-Designation and VCP Site, Multi-discipline)
- 540 West 26th Street, New York, NY (NYSDEC Spill Site, Multi-discipline)
- 550 Tenth Avenue, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 68 Charlton Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- Broome Street Parking Lot Site, New York, NY (NYSDEC BCP Site, Multi-discipline)
- Marble Collegiate Church Office Building, New York, NY (Multi-discipline)
- Norfolk Street Site, New York, NY (NYCOER E-Designation Site, Multi-discipline)

Steven Ciambruschini, PG, LEP

Principal/Vice President

Environmental Site Assessments/Investigations, Brownfield Remediation, UST Management

33 years in the industry ~ 28 years with Langan

Mr. Ciambruschini has over 30 years of experience in hydrogeologic and environmental investigations including management of environmental and geotechnical investigations relating to petroleum and chlorinated solvent spill sites, underground storage tank sites, manufactured gas plant sites, landfills, wastewater treatment facilities and industrial/commercial sites. His experience includes managing environmental compliance audits, remedial investigation, pre-acquisition due diligence and permitting assessment, feasibility studies and design, construction and operation of complex innovative remediation systems to treat, contain and recover contaminated soil and groundwater. These projects are managed under various NJDEP, PADEP, NYDEC, NYCDEP and CTDEP programs. Mr. Ciambruschini provides consultation to a diverse group of clients including private developers, utilities, retail and industrial facilities and is expert in assessing remediation options and funding options under various state and federal grant, loan and tax reimbursement programs including Brownfield programs.

Selected Projects

- Brodson Property, Montville NJ, (RCRA, NJDEP ACO Cleanup)
- Carroll Gardens, Brooklyn, NY (NY Brownfield, EPA Superfund, OER E-designated Site)
- Con Edison Appendix B Spill Sites - Various Locations, NY
- Former MGP Site, Brooklyn, NY (VCP Site)
- Extell Development, Hudson Yards, New York, NY (NYC E-designated, NYS Brownfield Site)
- Pan Graphics, Bergen County, NJ (ISRA, LSRP)
- New Jersey Turnpike General Environmental Services Contract, Various Sites, NJ
- Liberty Science Center, Jersey City, NJ (EO 215)
- Blue Back Square, West Hartford, CT (UST, Transfer Act, Brownfield)
- Hershey, Act II Investigation (PA VCP)
- Hershey, Naugatuck, CT (CT Transfer Act)
- Halby Chemical Sites, Various Sites, DE (CERCLA)
- Unisys, Middletown CT, (CT Transfer Act, Brownfield)
- Ryder Rental, Various Sites in CT (CT Transfer Act)
- St. Marks Avenue, Brooklyn, NY (Vapor Mitigation)
- Pan Graphics, Lodi, NJ (Eco Risk Assessment, LSRP)

Education

M.S., Geology
Montclair State University

M.A., Environmental Science
Montclair University

B.S., Environmental Science
Cook College, Rutgers University

Professional Registration

Professional Geologist (PG) in NY, DE, KY

Licensed Environmental Professional (LEP) in CT

Underground Storage Tank License in NJ

Affiliations

National Ground Water Association

Association of Ground Water Scientists and Engineers

American Association of Petroleum Geologists

Environmental Professionals of Connecticut

American Bar Association (ABA)

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ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		VOC			
EPA 8260C	Water	1,1,1,2-Tetrachloroethane	0.2	0.5	ug/L
EPA 8260C	Water	1,1,1-Trichloroethane	0.2	0.5	ug/L
EPA 8260C	Water	1,1,2,2-Tetrachloroethane	0.2	0.5	ug/L
EPA 8260C	Water	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.2	0.5	ug/L
EPA 8260C	Water	1,1,2-Trichloroethane	0.2	0.5	ug/L
EPA 8260C	Water	1,1-Dichloroethane	0.2	0.5	ug/L
EPA 8260C	Water	1,1-Dichloroethylene	0.2	0.5	ug/L
EPA 8260C	Water	Bromochloromethane	0.2	0.5	ug/L
EPA 8260C	Water	1,2,3-Trichloropropane	0.2	0.5	ug/L
EPA 8260C	Water	1,2,4-Trichlorobenzene	0.2	0.5	ug/L
EPA 8260C	Water	1,2,4-Trimethylbenzene	0.2	0.5	ug/L
EPA 8260C	Water	1,2-Dibromo-3-chloropropane	0.2	0.5	ug/L
EPA 8260C	Water	1,2-Dibromoethane	0.2	0.5	ug/L
EPA 8260C	Water	1,2-Dichlorobenzene	0.2	0.5	ug/L
EPA 8260C	Water	1,2-Dichloroethane	0.2	0.5	ug/L
EPA 8260C	Water	1,2-Dichloropropane	0.2	0.5	ug/L
EPA 8260C	Water	1,3,5-Trimethylbenzene	0.2	0.5	ug/L
EPA 8260C	Water	1,3-Dichlorobenzene	0.2	0.5	ug/L
EPA 8260C	Water	1,4-Dichlorobenzene	0.2	0.5	ug/L
EPA 8260C	Water	Cyclohexane	0.2	0.5	ug/L
EPA 8260C	Water	2-Butanone	0.2	0.5	ug/L
EPA 8260C	Water	2-Hexanone	0.2	0.5	ug/L
EPA 8260C	Water	4-Methyl-2-pentanone	0.2	0.5	ug/L
EPA 8260C	Water	Acetone	1	2	ug/L
EPA 8260C	Water	Acrolein	0.2	0.5	ug/L
EPA 8260C	Water	Acrylonitrile	0.2	0.5	ug/L
EPA 8260C	Water	Benzene	0.2	0.5	ug/L
EPA 8260C	Water	Bromodichloromethane	0.2	0.5	ug/L
EPA 8260C	Water	Bromoform	0.2	0.5	ug/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		VOC			
EPA 8260C	Water	Bromomethane	0.2	0.5	ug/L
EPA 8260C	Water	Carbon disulfide	0.2	0.5	ug/L
EPA 8260C	Water	Carbon tetrachloride	0.2	0.5	ug/L
EPA 8260C	Water	Chlorobenzene	0.2	0.5	ug/L
EPA 8260C	Water	Chloroethane	0.2	0.5	ug/L
EPA 8260C	Water	Chloroform	0.2	0.5	ug/L
EPA 8260C	Water	Chloromethane	0.2	0.5	ug/L
EPA 8260C	Water	cis-1,2-Dichloroethylene	0.2	0.5	ug/L
EPA 8260C	Water	cis-1,3-Dichloropropylene	0.2	0.5	ug/L
EPA 8260C	Water	Dibromochloromethane	0.2	0.5	ug/L
EPA 8260C	Water	Dibromomethane	0.2	0.5	ug/L
EPA 8260C	Water	Dichlorodifluoromethane	0.2	0.5	ug/L
EPA 8260C	Water	Naphthalene	1	2	ug/L
EPA 8260C	Water	Ethyl Benzene	0.2	0.5	ug/L
EPA 8260C	Water	Methylcyclohexane	0.2	0.5	ug/L
EPA 8260C	Water	Hexachlorobutadiene	0.2	0.5	ug/L
EPA 8260C	Water	Isopropylbenzene	0.2	0.5	ug/L
EPA 8260C	Water	Methyl acetate	0.2	0.5	ug/L
EPA 8260C	Water	Methyl tert-butyl ether (MTBE)	0.2	0.5	ug/L
EPA 8260C	Water	Methylene chloride	1	2	ug/L
EPA 8260C	Water	n-Butylbenzene	0.2	0.5	ug/L
EPA 8260C	Water	n-Propylbenzene	0.2	0.5	ug/L
EPA 8260C	Water	o-Xylene	0.2	0.5	ug/L
EPA 8260C	Water	p- & m- Xylenes	0.5	1	ug/L
EPA 8260C	Water	1,2,3-Trichlorobenzene	0.2	0.5	ug/L
EPA 8260C	Water	p-Isopropyltoluene	0.2	0.5	ug/L
EPA 8260C	Water	sec-Butylbenzene	0.2	0.5	ug/L
EPA 8260C	Water	Styrene	0.2	0.5	ug/L
EPA 8260C	Water	tert-Butyl alcohol (TBA)	0.5	1	ug/L

Method	Matrix	Analyte	MDL	RL	Units
VOC					
EPA 8260C	Water	tert-Butylbenzene	0.2	0.5	ug/L
EPA 8260C	Water	Tetrachloroethylene	0.2	0.5	ug/L
EPA 8260C	Water	Toluene	0.2	0.5	ug/L
EPA 8260C	Water	trans-1,2-Dichloroethylene	0.2	0.5	ug/L
EPA 8260C	Water	trans-1,3-Dichloropropylene	0.2	0.5	ug/L
EPA 8260C	Water	Trichloroethylene	0.2	0.5	ug/L
EPA 8260C	Water	Trichlorofluoromethane	0.2	0.5	ug/L
EPA 8260C	Water	Vinyl Chloride	0.2	0.5	ug/L
EPA 8260C	Water	Xylenes, Total	0.6	1.5	ug/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		SVOC			
EPA 8270D	Water	Acenaphthene	0.05	0.05	ug/L
EPA 8270D	Water	Acenaphthylene	0.05	0.05	ug/L
EPA 8270D	Water	Acetophenone	2.5	5	ug/L
EPA 8270D	Water	Aniline	2.5	5	ug/L
EPA 8270D	Water	Anthracene	0.05	0.05	ug/L
EPA 8270D	Water	Atrazine	0.5	0.5	ug/L
EPA 8270D	Water	Benzaldehyde	2.5	5	ug/L
EPA 8270D	Water	Benzidine	10	20	ug/L
EPA 8270D	Water	Benzo(a)anthracene	0.05	0.05	ug/L
EPA 8270D	Water	Benzo(a)pyrene	0.05	0.05	ug/L
EPA 8270D	Water	Benzo(b)fluoranthene	0.05	0.05	ug/L
EPA 8270D	Water	Benzo(g,h,i)perylene	0.05	0.05	ug/L
EPA 8270D	Water	Benzoic acid	25	50	ug/L
EPA 8270D	Water	Benzo(k)fluoranthene	0.05	0.05	ug/L
EPA 8270D	Water	Benzyl alcohol	2.5	5	ug/L
EPA 8270D	Water	Benzyl butyl phthalate	2.5	5	ug/L
EPA 8270D	Water	1,1'-Biphenyl	2.5	5	ug/L
EPA 8270D	Water	4-Bromophenyl phenyl ether	2.5	5	ug/L
EPA 8270D	Water	Caprolactam	2.5	5	ug/L
EPA 8270D	Water	Carbazole	2.5	5	ug/L
EPA 8270D	Water	4-Chloro-3-methylphenol	2.5	5	ug/L
EPA 8270D	Water	4-Chloroaniline	2.5	5	ug/L
EPA 8270D	Water	Bis(2-chloroethoxy)methane	2.5	5	ug/L
EPA 8270D	Water	Bis(2-chloroethyl)ether	2.5	5	ug/L
EPA 8270D	Water	Bis(2-chloroisopropyl)ether	2.5	5	ug/L
EPA 8270D	Water	2-Chloronaphthalene	2.5	5	ug/L
EPA 8270D	Water	2-Chlorophenol	2.5	5	ug/L
EPA 8270D	Water	4-Chlorophenyl phenyl ether	2.5	5	ug/L
EPA 8270D	Water	Chrysene	0.05	0.05	ug/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
SVOC					
EPA 8270D	Water	Dibenzo(a,h)anthracene	0.05	0.05	ug/L
EPA 8270D	Water	Dibenzofuran	2.5	5	ug/L
EPA 8270D	Water	Di-n-butyl phthalate	2.5	5	ug/L
EPA 8270D	Water	1,4-Dichlorobenzene	2.5	5	ug/L
EPA 8270D	Water	1,2-Dichlorobenzene	2.5	5	ug/L
EPA 8270D	Water	1,3-Dichlorobenzene	2.5	5	ug/L
EPA 8270D	Water	3,3'-Dichlorobenzidine	2.5	5	ug/L
EPA 8270D	Water	2,4-Dichlorophenol	2.5	5	ug/L
EPA 8270D	Water	Diethyl phthalate	2.5	5	ug/L
EPA 8270D	Water	2,4-Dimethylphenol	2.5	5	ug/L
EPA 8270D	Water	Dimethyl phthalate	2.5	5	ug/L
EPA 8270D	Water	4,6-Dinitro-2-methylphenol	2.5	5	ug/L
EPA 8270D	Water	2,4-Dinitrophenol	2.5	5	ug/L
EPA 8270D	Water	2,4-Dinitrotoluene	2.5	5	ug/L
EPA 8270D	Water	2,6-Dinitrotoluene	2.5	5	ug/L
EPA 8270D	Water	Di-n-octyl phthalate	2.5	5	ug/L
EPA 8270 SIM	Water	1,4-Dioxane	0.2	0.3	ug/L
EPA 8270D	Water	1,2-Diphenylhydrazine (as Azobenzene)	2.5	5	ug/L
EPA 8270D	Water	Bis(2-ethylhexyl)phthalate	0.5	0.5	ug/L
EPA 8270D	Water	Fluoranthene	0.05	0.05	ug/L
EPA 8270D	Water	Fluorene	0.05	0.05	ug/L
EPA 8270D	Water	Hexachlorobenzene	0.02	0.02	ug/L
EPA 8270D	Water	Hexachlorobutadiene	0.5	0.5	ug/L
EPA 8270D	Water	Hexachlorocyclopentadiene	2.5	5	ug/L
EPA 8270D	Water	Hexachloroethane	0.5	0.5	ug/L
EPA 8270D	Water	Indeno(1,2,3-cd)pyrene	0.05	0.05	ug/L
EPA 8270D	Water	Isophorone	2.5	5	ug/L
EPA 8270D	Water	2-Methylnaphthalene	2.5	5	ug/L
EPA 8270D	Water	2-Methylphenol	2.5	5	ug/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
SVOC					
EPA 8270D	Water	3- & 4-Methylphenols	2.5	5	ug/L
EPA 8270D	Water	Naphthalene	0.05	0.05	ug/L
EPA 8270D	Water	3-Nitroaniline	2.5	5	ug/L
EPA 8270D	Water	4-Nitroaniline	2.5	5	ug/L
EPA 8270D	Water	2-Nitroaniline	2.5	5	ug/L
EPA 8270D	Water	Nitrobenzene	0.25	0.25	ug/L
EPA 8270D	Water	4-Nitrophenol	2.5	5	ug/L
EPA 8270D	Water	2-Nitrophenol	2.5	5	ug/L
EPA 8270D	Water	N-nitroso-di-n-propylamine	2.5	5	ug/L
EPA 8270D	Water	N-Nitrosodimethylamine	0.5	0.5	ug/L
EPA 8270D	Water	N-Nitrosodiphenylamine	2.5	5	ug/L
EPA 8270D	Water	Pentachlorophenol	0.25	0.25	ug/L
EPA 8270D	Water	Phenanthrene	0.05	0.05	ug/L
EPA 8270D	Water	Phenol	2.5	5	ug/L
EPA 8270D	Water	Pyrene	0.05	0.05	ug/L
EPA 8270D	Water	Pyridine	2.5	5	ug/L
EPA 8270D	Water	1,2,4,5-Tetrachlorobenzene	2.5	5	ug/L
EPA 8270D	Water	2,3,4,6-Tetrachlorophenol	2.5	5	ug/L
EPA 8270D	Water	1,2,4-Trichlorobenzene	2.5	5	ug/L
EPA 8270D	Water	2,4,6-Trichlorophenol	2.5	5	ug/L
EPA 8270D	Water	2,4,5-Trichlorophenol	2.5	5	ug/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
Pesticides					
EPA 8081B	Water	Aldrin	0.004	0.004	ug/L
EPA 8081B	Water	alpha-BHC	0.004	0.004	ug/L
EPA 8081B	Water	beta-BHC	0.004	0.004	ug/L
EPA 8081B	Water	delta-BHC	0.004	0.004	ug/L
EPA 8081B	Water	gamma-BHC (Lindane)	0.004	0.004	ug/L
EPA 8081B	Water	gamma-Chlordane	0.01	0.01	ug/L
EPA 8081B	Water	alpha-Chlordane	0.004	0.004	ug/L
EPA 8081B	Water	Chlordane, total	0.04	0.04	ug/L
EPA 8081B	Water	4,4'-DDD	0.004	0.004	ug/L
EPA 8081B	Water	4,4'-DDE	0.004	0.004	ug/L
EPA 8081B	Water	4,4'-DDT	0.004	0.004	ug/L
EPA 8081B	Water	Dieldrin	0.002	0.002	ug/L
EPA 8081B	Water	Endosulfan I	0.004	0.004	ug/L
EPA 8081B	Water	Endosulfan II	0.004	0.004	ug/L
EPA 8081B	Water	Endosulfan sulfate	0.004	0.004	ug/L
EPA 8081B	Water	Endrin	0.004	0.004	ug/L
EPA 8081B	Water	Endrin aldehyde	0.01	0.01	ug/L
EPA 8081B	Water	Endrin ketone	0.01	0.01	ug/L
EPA 8081B	Water	Heptachlor	0.004	0.004	ug/L
EPA 8081B	Water	Heptachlor epoxide	0.004	0.004	ug/L
EPA 8081B	Water	Methoxychlor	0.004	0.004	ug/L
EPA 8081B	Water	Toxaphene	0.1	0.1	ug/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		PCBs			
EPA 8082A	Water	Aroclor 1016	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1221	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1232	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1242	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1248	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1254	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1260	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1262	0.05	0.05	ug/L
EPA 8082A	Water	Aroclor 1268	0.05	0.05	ug/L
EPA 8082A	Water	Total PCBs	0.05	0.05	ug/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
Metals					
EPA 6010C	Water	Aluminum	0.01	0.01	mg/L
EPA 6010C	Water	Antimony	0.005	0.005	mg/L
EPA 6010C	Water	Arsenic	0.004	0.004	mg/L
EPA 6010C	Water	Barium	0.01	0.01	mg/L
EPA 6010C	Water	Beryllium	0.001	0.001	mg/L
EPA 6010C	Water	Cadmium	0.003	0.003	mg/L
EPA 6010C	Water	Calcium	0.05	0.05	mg/L
EPA 6010C	Water	Chromium	0.005	0.005	mg/L
EPA 6010C	Water	Cobalt	0.005	0.005	mg/L
EPA 6010C	Water	Copper	0.003	0.003	mg/L
EPA 6010C	Water	Iron	0.02	0.02	mg/L
EPA 6010C	Water	Lead	0.003	0.003	mg/L
EPA 6010C	Water	Magnesium	0.05	0.05	mg/L
EPA 6010C	Water	Manganese	0.005	0.005	mg/L
EPA 7473	Water	Mercury	0.002	0.002	mg/L
EPA 6010C	Water	Nickel	0.005	0.005	mg/L
EPA 6010C	Water	Potassium	0.05	0.05	mg/L
EPA 6010C	Water	Selenium	0.01	0.01	mg/L
EPA 6010C	Water	Silver	0.005	0.005	mg/L
EPA 6010C	Water	Sodium	0.1	0.1	mg/L
EPA 6010C	Water	Thallium	0.005	0.005	mg/L
EPA 6010C	Water	Vanadium	0.01	0.01	mg/L
EPA 6010C	Water	Zinc	0.01	0.01	mg/L

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		PFAS			
Modified EPA 537	Water	Perfluorobutanesulfonic acid (PFBS)	0.294	2	ng/L
Modified EPA 537	Water	Perfluorohexanoic acid (PFHxA)	0.471	2	ng/L
Modified EPA 537	Water	Perfluoroheptanoic acid (PFHpA)	0.635	2	ng/L
Modified EPA 537	Water	Perfluorohexanesulfonic acid (PFHxS)	0.281	2	ng/L
Modified EPA 537	Water	Perfluorooctanoic acid (PFOA)	0.531	2	ng/L
Modified EPA 537	Water	Perfluorooctanesulfonic acid (PFOS)	0.292	2	ng/L
Modified EPA 537	Water	Perfluorononanoic acid (PFNA)	0.574	2	ng/L
Modified EPA 537	Water	Perfluorodecanoic acid (PFDA)	0.524	2	ng/L
Modified EPA 537	Water	Perfluoroundecanoic acid (PFUnA)	0.657	2	ng/L
Modified EPA 537	Water	Perfluorododecanoic acid (PFDoA)	0.777	2	ng/L
Modified EPA 537	Water	Perfluorotridecanoic acid (PFTrDA)	1.37	2	ng/L
Modified EPA 537	Water	Perfluorotetradecanoic acid (PFTA)	0.531	2	ng/L
Modified EPA 537	Water	N-MeFOSAA	0.529	2	ng/L
Modified EPA 537	Water	N-EtFOSAA	0.557	2	ng/L
Modified EPA 537	Water	Perfluoropentanoic acid (PFPeA)	0.452	2	ng/L
Modified EPA 537	Water	Perfluoro-1-octanesulfonamide (FOSA)	0.296	2	ng/L
Modified EPA 537	Water	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.415	2	ng/L
Modified EPA 537	Water	Perfluoro-1-decanesulfonic acid (PFDS)	0.574	2	ng/L
Modified EPA 537	Water	1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	0.492	5	ng/L
Modified EPA 537	Water	1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	0.399	2	ng/L
Modified EPA 537	Water	Perfluoro-n-butanoic acid (PFBA)	1.63	2	ng/L

Notes

* = The contract labs has indicated that they are not able to achieve the reporting limits of 2 ng/L for 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS). Site specific decisions will need to be made by the DEC project manager in consultation with the DEC remedial program chemist

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Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		VOC			
EPA 8260C	Soil	1,1,1,2-Tetrachloroethane	2.5	5	ug/kg
EPA 8260C	Soil	1,1,1-Trichloroethane	2.5	5	ug/kg
EPA 8260C	Soil	1,1,2,2-Tetrachloroethane	2.5	5	ug/kg
EPA 8260C	Soil	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	2.5	5	ug/kg
EPA 8260C	Soil	1,1,2-Trichloroethane	2.5	5	ug/kg
EPA 8260C	Soil	1,1-Dichloroethane	2.5	5	ug/kg
EPA 8260C	Soil	1,1-Dichloroethylene	2.5	5	ug/kg
EPA 8260C	Soil	Bromochloromethane	2.5	5	ug/kg
EPA 8260C	Soil	1,2,3-Trichloropropane	2.5	5	ug/kg
EPA 8260C	Soil	1,2,4-Trichlorobenzene	2.5	5	ug/kg
EPA 8260C	Soil	1,2,4-Trimethylbenzene	2.5	5	ug/kg
EPA 8260C	Soil	1,2-Dibromo-3-chloropropane	2.5	5	ug/kg
EPA 8260C	Soil	1,2-Dibromoethane	2.5	5	ug/kg
EPA 8260C	Soil	1,2-Dichlorobenzene	2.5	5	ug/kg
EPA 8260C	Soil	1,2-Dichloroethane	2.5	5	ug/kg
EPA 8260C	Soil	1,2-Dichloropropane	2.5	5	ug/kg
EPA 8260C	Soil	1,3,5-Trimethylbenzene	2.5	5	ug/kg
EPA 8260C	Soil	1,3-Dichlorobenzene	2.5	5	ug/kg
EPA 8260C	Soil	1,4-Dichlorobenzene	2.5	5	ug/kg
EPA 8260C	Soil	1,4-Dioxane	10	10	ug/kg
EPA 8260C	Soil	Cyclohexane	2.5	5	ug/kg
EPA 8260C	Soil	2-Butanone	2.5	5	ug/kg
EPA 8260C	Soil	2-Hexanone	2.5	5	ug/kg
EPA 8260C	Soil	4-Methyl-2-pentanone	2.5	5	ug/kg
EPA 8260C	Soil	Acetone	5	10	ug/kg
EPA 8260C	Soil	Acrolein	5	10	ug/kg
EPA 8260C	Soil	Acrylonitrile	2.5	5	ug/kg
EPA 8260C	Soil	Benzene	2.5	5	ug/kg
EPA 8260C	Soil	Bromodichloromethane	2.5	5	ug/kg

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		VOC			
EPA 8260C	Soil	Bromoform	2.5	5	ug/kg
EPA 8260C	Soil	Bromomethane	2.5	5	ug/kg
EPA 8260C	Soil	Carbon disulfide	2.5	5	ug/kg
EPA 8260C	Soil	Carbon tetrachloride	2.5	5	ug/kg
EPA 8260C	Soil	Chlorobenzene	2.5	5	ug/kg
EPA 8260C	Soil	Chloroethane	2.5	5	ug/kg
EPA 8260C	Soil	Chloroform	2.5	5	ug/kg
EPA 8260C	Soil	Chloromethane	2.5	5	ug/kg
EPA 8260C	Soil	cis-1,2-Dichloroethylene	2.5	5	ug/kg
EPA 8260C	Soil	cis-1,3-Dichloropropylene	2.5	5	ug/kg
EPA 8260C	Soil	Dibromochloromethane	2.5	5	ug/kg
EPA 8260C	Soil	Dibromomethane	2.5	5	ug/kg
EPA 8260C	Soil	Dichlorodifluoromethane	2.5	5	ug/kg
EPA 8260C	Soil	Naphthalene	2.5	10	ug/kg
EPA 8260C	Soil	Ethyl Benzene	2.5	5	ug/kg
EPA 8260C	Soil	Methylcyclohexane	2.5	5	ug/kg
EPA 8260C	Soil	Hexachlorobutadiene	2.5	5	ug/kg
EPA 8260C	Soil	Isopropylbenzene	2.5	5	ug/kg
EPA 8260C	Soil	Methyl acetate	2.5	5	ug/kg
EPA 8260C	Soil	Methyl tert-butyl ether (MTBE)	2.5	5	ug/kg
EPA 8260C	Soil	Methylene chloride	5	10	ug/kg
EPA 8260C	Soil	n-Butylbenzene	2.5	5	ug/kg
EPA 8260C	Soil	n-Propylbenzene	2.5	5	ug/kg
EPA 8260C	Soil	1,2,3-Trichlorobenzene	2.5	5	ug/kg
EPA 8260C	Soil	o-Xylene	2.5	5	ug/kg
EPA 8260C	Soil	p- & m- Xylenes	5	10	ug/kg
EPA 8260C	Soil	p-Isopropyltoluene	2.5	5	ug/kg
EPA 8260C	Soil	sec-Butylbenzene	2.5	5	ug/kg
EPA 8260C	Soil	Styrene	2.5	5	ug/kg

Method	Matrix	Analyte	MDL	RL	Units
VOC					
EPA 8260C	Soil	tert-Butyl alcohol (TBA)	2.5	5	ug/kg
EPA 8260C	Soil	tert-Butylbenzene	2.5	5	ug/kg
EPA 8260C	Soil	Tetrachloroethylene	2.5	5	ug/kg
EPA 8260C	Soil	Toluene	2.5	5	ug/kg
EPA 8260C	Soil	trans-1,2-Dichloroethylene	2.5	5	ug/kg
EPA 8260C	Soil	trans-1,3-Dichloropropylene	2.5	5	ug/kg
EPA 8260C	Soil	Trichloroethylene	2.5	5	ug/kg
EPA 8260C	Soil	Trichlorofluoromethane	2.5	5	ug/kg
EPA 8260C	Soil	Vinyl Chloride	2.5	5	ug/kg
EPA 8260C	Soil	Xylenes, Total	7.5	15	ug/kg

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		SVOC			
EPA 8270D	Soil	Acenaphthene	20.9	41.7	ug/kg
EPA 8270D	Soil	Acenaphthylene	20.9	41.7	ug/kg
EPA 8270D	Soil	Acetophenone	20.9	41.7	ug/kg
EPA 8270D	Soil	Aniline	83.5	167	ug/kg
EPA 8270D	Soil	Anthracene	20.9	41.7	ug/kg
EPA 8270D	Soil	Atrazine	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzaldehyde	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzidine	83.5	167	ug/kg
EPA 8270D	Soil	Benzo(a)anthracene	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzo(a)pyrene	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzo(b)fluoranthene	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzo(g,h,i)perylene	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzoic acid	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzo(k)fluoranthene	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzyl alcohol	20.9	41.7	ug/kg
EPA 8270D	Soil	Benzyl butyl phthalate	20.9	41.7	ug/kg
EPA 8270D	Soil	1,1'-Biphenyl	20.9	41.7	ug/kg
EPA 8270D	Soil	4-Bromophenyl phenyl ether	20.9	41.7	ug/kg
EPA 8270D	Soil	Caprolactam	41.7	83.3	ug/kg
EPA 8270D	Soil	Carbazole	20.9	41.7	ug/kg
EPA 8270D	Soil	4-Chloro-3-methylphenol	20.9	41.7	ug/kg
EPA 8270D	Soil	4-Chloroaniline	20.9	41.7	ug/kg
EPA 8270D	Soil	Bis(2-chloroethoxy)methane	20.9	41.7	ug/kg
EPA 8270D	Soil	Bis(2-chloroethyl)ether	20.9	41.7	ug/kg
EPA 8270D	Soil	Bis(2-chloroisopropyl)ether	20.9	41.7	ug/kg
EPA 8270D	Soil	2-Chloronaphthalene	20.9	41.7	ug/kg
EPA 8270D	Soil	2-Chlorophenol	20.9	41.7	ug/kg
EPA 8270D	Soil	4-Chlorophenyl phenyl ether	20.9	41.7	ug/kg
EPA 8270D	Soil	Chrysene	20.9	41.7	ug/kg

ATTACHMENT B
Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		SVOC			
EPA 8270D	Soil	Dibenzo(a,h)anthracene	20.9	41.7	ug/kg
EPA 8270D	Soil	Dibenzofuran	20.9	41.7	ug/kg
EPA 8270D	Soil	Di-n-butyl phthalate	20.9	41.7	ug/kg
EPA 8270D	Soil	1,2-Dichlorobenzene	20.9	41.7	ug/kg
EPA 8270D	Soil	1,3-Dichlorobenzene	20.9	41.7	ug/kg
EPA 8270D	Soil	1,4-Dichlorobenzene	20.9	41.7	ug/kg
EPA 8270D	Soil	3,3'-Dichlorobenzidine	20.9	41.7	ug/kg
EPA 8270D	Soil	2,4-Dichlorophenol	20.9	41.7	ug/kg
EPA 8270D	Soil	Diethyl phthalate	20.9	41.7	ug/kg
EPA 8270D	Soil	2,4-Dimethylphenol	20.9	41.7	ug/kg
EPA 8270D	Soil	Dimethyl phthalate	20.9	41.7	ug/kg
EPA 8270D	Soil	4,6-Dinitro-2-methylphenol	41.7	83.3	ug/kg
EPA 8270D	Soil	2,4-Dinitrophenol	41.7	83.3	ug/kg
EPA 8270D	Soil	2,4-Dinitrotoluene	20.9	41.7	ug/kg
EPA 8270D	Soil	2,6-Dinitrotoluene	20.9	41.7	ug/kg
EPA 8270D	Soil	Di-n-octyl phthalate	20.9	41.7	ug/kg
EPA 8270D	Soil	1,2-Diphenylhydrazine (as Azobenzene)	20.9	41.7	ug/kg
EPA 8270D	Soil	Bis(2-ethylhexyl)phthalate	20.9	41.7	ug/kg
EPA 8270D	Soil	Fluoranthene	20.9	41.7	ug/kg
EPA 8270D	Soil	Fluorene	20.9	41.7	ug/kg
EPA 8270D	Soil	Hexachlorobenzene	20.9	41.7	ug/kg
EPA 8270D	Soil	Hexachlorobutadiene	20.9	41.7	ug/kg
EPA 8270D	Soil	Hexachlorocyclopentadiene	20.9	41.7	ug/kg
EPA 8270D	Soil	Hexachloroethane	20.9	41.7	ug/kg
EPA 8270D	Soil	Indeno(1,2,3-cd)pyrene	20.9	41.7	ug/kg
EPA 8270D	Soil	Isophorone	20.9	41.7	ug/kg
EPA 8270D	Soil	2-Methylnaphthalene	20.9	41.7	ug/kg
EPA 8270D	Soil	2-Methylphenol	20.9	41.7	ug/kg
EPA 8270D	Soil	3- & 4-Methylphenols	20.9	41.7	ug/kg

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
SVOC					
EPA 8270D	Soil	Naphthalene	20.9	41.7	ug/kg
EPA 8270D	Soil	4-Nitroaniline	41.7	83.3	ug/kg
EPA 8270D	Soil	2-Nitroaniline	41.7	83.3	ug/kg
EPA 8270D	Soil	3-Nitroaniline	41.7	83.3	ug/kg
EPA 8270D	Soil	Nitrobenzene	20.9	41.7	ug/kg
EPA 8270D	Soil	2-Nitrophenol	20.9	41.7	ug/kg
EPA 8270D	Soil	4-Nitrophenol	41.7	83.3	ug/kg
EPA 8270D	Soil	N-nitroso-di-n-propylamine	20.9	41.7	ug/kg
EPA 8270D	Soil	N-Nitrosodimethylamine	20.9	41.7	ug/kg
EPA 8270D	Soil	N-Nitrosodiphenylamine	20.9	41.7	ug/kg
EPA 8270D	Soil	Pentachlorophenol	20.9	41.7	ug/kg
EPA 8270D	Soil	Phenanthrene	20.9	41.7	ug/kg
EPA 8270D	Soil	Phenol	20.9	41.7	ug/kg
EPA 8270D	Soil	Pyrene	20.9	41.7	ug/kg
EPA 8270D	Soil	Pyridine	83.5	167	ug/kg
EPA 8270D	Soil	1,2,4,5-Tetrachlorobenzene	41.7	83.3	ug/kg
EPA 8270D	Soil	2,3,4,6-Tetrachlorophenol	41.7	83.3	ug/kg
EPA 8270D	Soil	1,2,4-Trichlorobenzene	20.9	41.7	ug/kg
EPA 8270D	Soil	2,4,6-Trichlorophenol	20.9	41.7	ug/kg
EPA 8270D	Soil	2,4,5-Trichlorophenol	20.9	41.7	ug/kg

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		Pesticides			
EPA 8081B	Soil	Aldrin	0.33	0.33	ug/kg
EPA 8081B	Soil	alpha-BHC	0.33	0.33	ug/kg
EPA 8081B	Soil	beta-BHC	0.33	0.33	ug/kg
EPA 8081B	Soil	delta-BHC	0.33	0.33	ug/kg
EPA 8081B	Soil	gamma-BHC (Lindane)	0.33	0.33	ug/kg
EPA 8081B	Soil	gamma-Chlordane	0.33	0.33	ug/kg
EPA 8081B	Soil	alpha-Chlordane	0.33	0.33	ug/kg
EPA 8081B	Soil	Chlordane, total	1.32	1.32	ug/kg
EPA 8081B	Soil	4,4'-DDD	0.33	0.33	ug/kg
EPA 8081B	Soil	4,4'-DDE	0.33	0.33	ug/kg
EPA 8081B	Soil	4,4'-DDT	0.33	0.33	ug/kg
EPA 8081B	Soil	Dieldrin	0.33	0.33	ug/kg
EPA 8081B	Soil	Endosulfan I	0.33	0.33	ug/kg
EPA 8081B	Soil	Endosulfan II	0.33	0.33	ug/kg
EPA 8081B	Soil	Endosulfan sulfate	0.33	0.33	ug/kg
EPA 8081B	Soil	Endrin	0.33	0.33	ug/kg
EPA 8081B	Soil	Endrin aldehyde	0.33	0.33	ug/kg
EPA 8081B	Soil	Endrin ketone	0.33	0.33	ug/kg
EPA 8081B	Soil	Heptachlor	0.33	0.33	ug/kg
EPA 8081B	Soil	Heptachlor epoxide	0.33	0.33	ug/kg
EPA 8081B	Soil	Methoxychlor	1.65	1.65	ug/kg
EPA 8081B	Soil	Toxaphene	16.7	16.7	ug/kg

Method	Matrix	Analyte	MDL	RL	Units
		PCBs			
EPA 8082A	Soil	Aroclor 1016	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1221	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1232	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1242	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1248	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1254	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1260	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1262	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Aroclor 1268	0.0167	0.0167	mg/kg
EPA 8082A	Soil	Total PCBs	0.0167	0.0167	mg/kg

Method	Matrix	Analyte	MDL	RL	Units
		Metals			
EPA 6010C	Soil	Aluminum	1	1	mg/kg
EPA 6010C	Soil	Antimony	0.5	0.5	mg/kg
EPA 6010C	Soil	Arsenic	1	1	mg/kg
EPA 6010C	Soil	Barium	1	1	mg/kg
EPA 6010C	Soil	Beryllium	0.1	0.1	mg/kg
EPA 6010C	Soil	Cadmium	0.3	0.3	mg/kg
EPA 6010C	Soil	Calcium	0.5	5	mg/kg
EPA 6010C	Soil	Chromium	0.5	0.5	mg/kg
EPA 6010C	Soil	Cobalt	0.5	0.5	mg/kg
EPA 6010C	Soil	Copper	0.5	0.5	mg/kg
EPA 6010C	Soil	Iron	2	2	mg/kg
EPA 6010C	Soil	Lead	0.3	0.3	mg/kg
EPA 6010C	Soil	Magnesium	5	5	mg/kg
EPA 6010C	Soil	Manganese	0.5	0.5	mg/kg
EPA 7473	Soil	Mercury	0.03	0.03	mg/kg
EPA 6010C	Soil	Nickel	0.5	0.5	mg/kg
EPA 6010C	Soil	Potassium	5	5	mg/kg
EPA 6010C	Soil	Selenium	1	1	mg/kg
EPA 6010C	Soil	Silver	0.5	0.5	mg/kg
EPA 6010C	Soil	Sodium	10	10	mg/kg
EPA 6010C	Soil	Thallium	1	1	mg/kg
EPA 6010C	Soil	Vanadium	1	1	mg/kg
EPA 6010C	Soil	Zinc	1	1	mg/kg

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		PFAS			
Modified EPA 537	Soil	Perfluorobutanesulfonic acid (PFBS)	0.2	0.25	ug/kg
Modified EPA 537	Soil	Perfluorohexanoic acid (PFHxA)	0.0659	0.25	ug/kg
Modified EPA 537	Soil	Perfluoroheptanoic acid (PFHpA)	0.0455	0.25	ug/kg
Modified EPA 537	Soil	Perfluorohexanesulfonic acid (PFHxS)	0.031	0.25	ug/kg
Modified EPA 537	Soil	Perfluorooctanoic acid (PFOA)	0.0772	0.25	ug/kg
Modified EPA 537	Soil	Perfluorooctanesulfonic acid (PFOS)	0.0438	0.25	ug/kg
Modified EPA 537	Soil	Perfluorononanoic acid (PFNA)	0.0598	0.25	ug/kg
Modified EPA 537	Soil	Perfluorodecanoic acid (PFDA)	0.0512	0.25	ug/kg
Modified EPA 537	Soil	Perfluoroundecanoic acid (PFUnA)	0.116	0.25	ug/kg
Modified EPA 537	Soil	Perfluorododecanoic acid (PFDoA)	0.075	0.25	ug/kg
Modified EPA 537	Soil	Perfluorotridecanoic acid (PFTrDA)	0.0435	0.25	ug/kg
Modified EPA 537	Soil	Perfluorotetradecanoic acid (PFTA)	0.0747	0.25	ug/kg
Modified EPA 537	Soil	N-MeFOSAA	0.104	0.25	ug/kg
Modified EPA 537	Soil	N-EtFOSAA	0.104	0.25	ug/kg
Modified EPA 537	Soil	Perfluoropentanoic acid (PFPeA)	0.0919	0.25	ug/kg
Modified EPA 537	Soil	Perfluoro-1-octanesulfonamide (FOSA)	0.0467	0.25	ug/kg
Modified EPA 537	Soil	Perfluoro-1-heptanesulfonic acid (PFHpS)	0.0493	0.25	ug/kg
Modified EPA 537	Soil	Perfluoro-1-decanesulfonic acid (PFDS)	0.0512	0.25	ug/kg
Modified EPA 537	Soil	1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	0.066	0.25	ug/kg
Modified EPA 537	Soil	1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	0.0256	0.25	ug/kg
Modified EPA 537	Soil	Perfluoro-n-butanoic acid (PFBA)	0.183	0.25	ug/kg

ATTACHMENT B
Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		VOC			
EPA TO-15	Soil Vapor	1,1,1,2-Tetrachloroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,1,1-Trichloroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,1,2,2-Tetrachloroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,1,2-Trichloroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,1-Dichloroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,1-Dichloroethylene	0.025	0.025	ppb
EPA TO-15	Soil Vapor	1,2,4-Trichlorobenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,2,4-Trimethylbenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,2-Dibromoethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,2-Dichlorobenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,2-Dichloroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,2-Dichloropropane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,2-Dichlorotetrafluoroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,3,5-Trimethylbenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,3-Butadiene	0.3	0.3	ppb
EPA TO-15	Soil Vapor	1,3-Dichlorobenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,3-Dichloropropane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,4-Dichlorobenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	1,4-Dioxane	0.2	0.2	ppb
EPA TO-15	Soil Vapor	2-Butanone	0.1	0.1	ppb
EPA TO-15	Soil Vapor	2-Hexanone	0.2	0.2	ppb
EPA TO-15	Soil Vapor	3-Chloropropene	0.5	0.5	ppb
EPA TO-15	Soil Vapor	4-Methyl-2-pentanone	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Acetone	0.2	0.2	ppb
EPA TO-15	Soil Vapor	Acrolein	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Acrylonitrile	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Benzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Benzyl chloride	0.1	0.1	ppb

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
		VOC			
EPA TO-15	Soil Vapor	Bromodichloromethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Bromoform	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Bromomethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Carbon disulfide	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Carbon tetrachloride	0.025	0.025	ppb
EPA TO-15	Soil Vapor	Chlorobenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Chloroethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Chloroform	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Chloromethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	cis-1,2-Dichloroethylene	0.025	0.025	ppb
EPA TO-15	Soil Vapor	cis-1,3-Dichloropropylene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Cyclohexane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Dibromochloromethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Dichlorodifluoromethane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Ethanol	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Ethyl acetate	0.2	0.2	ppb
EPA TO-15	Soil Vapor	Ethyl Benzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Hexachlorobutadiene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Isopropanol	0.2	0.2	ppb
EPA TO-15	Soil Vapor	Isopropylbenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Methyl Methacrylate	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Methyl tert-butyl ether (MTBE)	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Methylene chloride	0.2	0.2	ppb
EPA TO-15	Soil Vapor	Naphthalene	0.2	0.2	ppb
EPA TO-15	Soil Vapor	n-Butylbenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	n-Heptane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	n-Hexane	0.1	0.1	ppb
EPA TO-15	Soil Vapor	n-Propylbenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	o-Xylene	0.1	0.1	ppb

ATTACHMENT B

Laboratory Reporting Limits and Method Detection Limits

Method	Matrix	Analyte	MDL	RL	Units
VOC					
EPA TO-15	Soil Vapor	p- & m- Xylenes	0.2	0.2	ppb
EPA TO-15	Soil Vapor	p-Ethyltoluene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	p-Isopropyltoluene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Propylene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	sec-Butylbenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Styrene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	tert-Butylbenzene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Tetrachloroethylene	0.025	0.025	ppb
EPA TO-15	Soil Vapor	Tetrahydrofuran	0.2	0.2	ppb
EPA TO-15	Soil Vapor	Toluene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	trans-1,2-Dichloroethylene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	trans-1,3-Dichloropropylene	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Trichloroethylene	0.025	0.025	ppb
EPA TO-15	Soil Vapor	Trichlorofluoromethane (Freon 11)	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Vinyl acetate	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Vinyl bromide	0.1	0.1	ppb
EPA TO-15	Soil Vapor	Vinyl Chloride	0.025	0.025	ppb

Analytical Method Information

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PFAS, NYSDEC Target List in Soil (EPA 537m)

Preservation: Cool 4°C

Container: 10_250mL Plastic Cool to 4° C **Amount Required:** 250 mL **Hold Time:** 14 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Perfluorobutanesulfonic acid (PFBS)	0.200	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorohexanoic acid (PFHxA)	0.0659	0.250 ug/kg		30	25-150	35	50-130	30
Perfluoroheptanoic acid (PFHpA)	0.0455	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorohexanesulfonic acid (PFHxS)	0.0310	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorooctanoic acid (PFOA)	0.0772	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorooctanesulfonic acid (PFOS)	0.0438	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorononanoic acid (PFNA)	0.0598	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorodecanoic acid (PFDA)	0.0512	0.250 ug/kg		30	25-150	35	50-130	30
Perfluoroundecanoic acid (PFUnA)	0.116	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorododecanoic acid (PFDoA)	0.0750	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorotridecanoic acid (PFTrDA)	0.0435	0.250 ug/kg		30	25-150	35	50-130	30
Perfluorotetradecanoic acid (PFTA)	0.0747	0.250 ug/kg		30	25-150	35	50-130	30
N-MeFOSAA	0.104	0.250 ug/kg		30	25-150	35	50-130	30
N-EtFOSAA	0.104	0.250 ug/kg		30	25-150	35	50-130	30
Perfluoropentanoic acid (PFPeA)	0.0919	0.250 ug/kg		30	25-150	35	50-130	30
Perfluoro-1-octanesulfonamide (FOSA)	0.0467	0.250 ug/kg		30	25-150	35	50-130	30
Perfluoro-1-heptanesulfonic acid (PFHpS)	0.0493	0.250 ug/kg		30	25-150	35	50-130	30
Perfluoro-1-decanesulfonic acid (PFDS)	0.0512	0.250 ug/kg		30	25-150	35	50-130	30
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	0.0660	0.250 ug/kg		30	25-200	35	50-200	30
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	0.0256	0.250 ug/kg		30	25-200	35	50-200	30
Perfluoro-n-butanoic acid (PFBA)	0.183	0.250 ug/kg		30	25-150	35	50-130	30
Surr: M3PFBS			25-150					
Surr: M5PFHxA			25-150					
Surr: M4PFHpA			25-150					
Surr: M3PFHxS			25-150					
Surr: Perfluoro-n-[13C8]octanoic acid (M8PFOA)			25-150					
Surr: M6PFDA			25-150					
Surr: M7PFUdA			25-150					
Surr: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)			25-150					
Surr: M2PFTeDA			10-150					
Surr: Perfluoro-n-[13C4]butanoic acid (MPFBA)			25-150					
Surr: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)			25-150					
Surr: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)			25-150					
Surr: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)			10-150					
Surr: d3-N-MeFOSAA			25-150					
Surr: d5-N-EtFOSAA			25-150					
Surr: M2-6:2 FTS			25-200					
Surr: M2-8:2 FTS			25-200					
Surr: M9PFNA			25-150					
MPFOA								

ATTACHMENT C

Analytical Methods / Quality Assurance Summary Table

ATTACHMENT C
ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE

Matrix Type	Field Parameters	Laboratory Parameters	Analytical Methods	Sample Preservation	Sample Container Volume and Type	Sample Hold Time	Number of Samples to be Collected	Field Duplicate Samples	Equipment Blank Samples	Trip Blank Samples	Ambient Air Samples	MS/MSD Samples
Soil	Total VOCs via PID	Part 375 + TCL VOCs / CP-51 VOCs	EPA 8260C	Cool to 4°C	Two 40-ml VOC vials with 5ml H_2O, one with MeOH or 3 Encore Samplers (separate container for % solids)	14 days, freeze at lab within 48 hours	14	1 per 20 samples (minimum 1)	1 per 20 samples, if needed (minimum 1, if needed)	1 per shipment of VOC samples	NA	1 per 20 samples (minimum 1)
		Part 375 + TCL SVOCs / CP-51 SVOCs	EPA 8270D	Cool to 4°C	4 oz. jar*	14 days extract, 40 days after extraction to analysis						
		1,4-Dioxane	EPA 8270D	Cool to 4°C	8 oz. jar	14 days extract, 40 days after extraction to analysis						
		Part 375 + TAL Metals	EPA 6010C, EPA 7470, EPA 7196A, EPA 9014/9010C	Cool to 4°C	2 oz. jar*	6 months, except Mercury 28 days						
		Hexavalent Chromium	EPA 7196A	Cool to 4°C	2 oz. jar*	28 days						
		Perfluoroalkyl Substances (PFAs)	EPA 537.1	Cool to 4°C	1/2 filled 250mL HDPE container	14 days extract, 40 days after extraction to analysis						
		Part 375 + TCL Herbicides	EPA 8151A	Cool to 4°C	4 oz. jar*	14 days extract, 40 days after extraction to analysis						
		Part 375 + TCL Pesticides	EPA 8081B	Cool to 4°C	4 oz. jar*	14 days extract, 40 days after extraction to analysis						
		Part 375 + TCL PCBs	EPA 8082A	Cool to 4°C	4 oz. jar*	14 days extract, 40 days after extraction to analysis						
Groundwater	Headspace VOCs via PID, synoptic groundwater level measurement, 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	14 days	0	1 per 20 samples (minimum 1)	1 per 20 samples, if needed (minimum 1, if needed)	1 per shipment of VOC samples	NA	1 per 20 samples (minimum 1)
		Part 375 + TCL SVOCs / CP-51 SVOCs	EPA 8270D	Cool to 4°C	Two 1-Liter Amber Glass	7 days to extract, 40 days after extraction to analysis						
		1,4-Dioxane	EPA 8270D SIM	Cool to 4°C	1-L Amber Glass	7 days to extract, 40 days after extraction to analysis						
		Part 375 + TAL Metals	EPA 6010C, EPA 7470, EPA 7196A, EPA 9014/9010C	Cool to 4°C	Two 1-Liter Amber Glass	6 months, except Mercury 28 days						
		Hexavalent Chromium	EPA 7196A	Cool to 4°C	250 mL Plastic	24 hours						
		Perfluoroalkyl Substances (PFAs)	EPA 537.1	Cool to 4°C	Two 250mL HDPE containers	14 days extract, 40 days after extraction to analysis						
		Part 375 + TCL Herbicides	EPA 8151A	Cool to 4°C	Two 1-Liter Amber Glass	7 days to extraction, 40 days after extraction to analysis						
		Part 375 + TCL Pesticides	EPA 8081B	Cool to 4°C	Two 1-Liter Amber Glass	7 days extract, 40 days after extraction to analysis						
		Part 375 + TCL PCBs	EPA 8082A	Cool to 4°C	Two 1-Liter Amber Glass	7 days extract, 40 days after extraction to analysis						

Notes:
*can be combined in one or more 8 oz. jars
mL = milliliter
VOC = Volatile organic compound
SVOC = Semi-volatile organic compound
PCB = Polychlorinated biphenyls
TAL = Total Analyte List
TCL = Target Criteria List
PID = Photoionization detector
Part 375 = New York State Department of Environmental Conservation (NYSDEC) Title 6 New York City Rules and Regulation (NYCRR) Part 375 List.
ORP = Oxidation reduction potential
EPA = U.S. Environmental Protection Agency
NA = Not applicable
ºC = degree Celsius
The PFAS compounds to be analyzed includes: perfluorobutanesulfonic acid, perfluorohexanesulfonic acid, perfluoroheptanesulfonic acid, perfluorooctanessulfonic acid, perfluorodecanesulfonic acid, perfluorobutanoic acid, perfluoropentanoic acid, perfluorohexanoic acid, perfluoroheptanoic acid, perfluorooctanoic acid, perfluorononanoic acid, perfluorodecanoic acid, perfluoroundecanoic acid, perfluorododecanoic acid, perfluorotridecanoic acid, perfluorotetradecanoic acid, 6:2 fluorotelomer sulfonate, 8:2 fluorotelomer sulfonate, perfluoroctanesulfonamide, n-methyl perfluorooctanesulfonamidoacetic acid, and n-ethyl perfluorooctanesulfonamidoacetic acid.

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

Laboratory Standard Operating Procedures for PFAS Analysis

Standard Operating Procedure

Analysis of Target Per- and Polyfluorinated Alkyl Substances (PFAS) in Potable Water by EPA Method 537.1 using HPLC/MS-MS

Approvals

Laboratory Director 12058 ______________________ Jon Walsh

Corporate Technical Director ______________________ Robert Bradley

Corporate QA/QC Officer ______________________ Sarah Widomski

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Target PFAS in Potable Water Matrices

1. SCOPE AND APPLICATION

This method is used to identify and quantitate specific PFAS compounds in extracts of Potable water samples using HPLC/MS-MS (high pressure liquid chromatography/ tandem mass spectrometry. Currently the compounds (18) that are measured by this methodology by EPA 537.1 are listed in the table below.

Analyte[a]	Acronym *	CAS Number
Hexafluoropropylene oxide dimer acid (GenX)	HFPO-DA	13252-13-6[b]
N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorotetradecanoic acid	PFTA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnA	2058-94-8
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9[c]
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1[d]
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4[e]

[a] Some PFAS are commercially available as ammonium, sodium and potassium salts. This method measures all forms of the analytes as anions while the counterion is inconsequential. Analytes may be purchased as acids or as any of the corresponding salts.
[b] HFPO-DA and the ammonium salt of HFPO-DA are components of the GenX processing aid technology and both are measured as the anion of HFPO-DA by this method.
[c] 11Cl-PF3OUdS is available in salt form (e.g. CASRN of potassium salt is 83329-89-9).
[d] 9Cl-PF3ONS analyte is available in salt form (e.g. CASRN of potassium salt is 73606-19-6)
[e] ADONA is available as the sodium salt (no CASRN) and the ammonium salt (CASRN is 958445-44-8).

* These acronyms are those listed in EPA Method 537.1. The listed acronyms are also those in our LIMS database.

The estimated reporting limit based upon the preparation/analysis parameters herein at the time of this revision are 2.0 ng/L (ppt) for aqueous samples. The linear range for these PFAS can be extended by dilution. This RL is based upopn a minimum volume of 0.125 L extracted.

2. SUMMARY

2.1 This procedure is based upon EPA method 537.1 without modification when used for potable water sample preparation or analysis.

2.2 A 125-290 mL(depending upon the volume submitted by the client sample field preserved with 1.25 g/250 mL Trizma is extracted using automated or manual Solid Phase Extraction (SPE). The compounds are eluted from the solid phase using methanol. The extract is then slowly evaporated to dryness using a nitrogen evaporation system. The resulting extract residue is reconstituted in 95%/5% Methanol/water to a final volume of 1.0 mL.

2.3 A portion of the extract is then used for analysis of PFAS using a C18 LC column using a gradient program with 5mM ammonium acetate/water and methanol to effect separation followed by analysis using AJI-ESI (Electrospray) injection into a triple Quadrupole MS operated in negative ion mode.

2.4 Quantitation is done by internal standard technique and peak response is measured as the area of the peaks from the dynamic MRM (Multiple Reaction Monitoring) run.

3. DEFINITIONS

3.1 ANALYSIS BATCH – A set of samples that is analyzed on the same instrument during a 24-hour period, including no more than 20 Field Samples, that begins and ends with the analysis of the appropriate Continuing Calibration Check (CCC) standards. Additional CCCs may be required depending on the length of the analysis batch and/or the number of Field Samples.

3.2 CALIBRATION STANDARD (CAL) – A solution prepared from the primary dilution standard solution and/or stock standard solution, internal standard(s), and the surrogate(s). The CAL solutions are used to calibrate the instrument response with respect to analyte concentration.

3.3 COLLISIONALLY ACTIVATED DISSOCIATION (CAD) – The process of converting the precursor ion's translational energy into internal energy by collisions with neutral gas molecules to bring about dissociation into product ions.

3.4 CONTINUING CALIBRATION CHECK (CCC) – A calibration standard containing the method analytes, internal standard(s) and surrogate(s). The CCC is analyzed periodically to verify the accuracy of the existing calibration for those analytes.

3.5 DETECTION LIMIT (DL) – The minimum concentration of an analyte that can be identified, measured, and reported with 99% confidence that the analyte concentration is greater than zero. This is a statistical determination of precision (Sect. 9.2.7), and accurate quantitation is not expected at this level.[2]

3.6 EXTRACTION BATCH – A set of up to 20 Field Samples (not including QC samples) extracted together by the same person(s) during a work day using the same lot of SPE devices, solvents, surrogate, internal standard and fortifying solutions. Required QC samples include Laboratory Reagent Blank, Laboratory Fortified Blank, Laboratory Fortified Sample Matrix, and either a Field Duplicate or Laboratory Fortified Sample Matrix Duplicate.

3.7 FIELD DUPLICATES (FD1 and FD2) – Two separate samples collected at the same time and place under identical circumstances, and treated exactly the same throughout field and laboratory procedures. Analyses of FD1 and FD2 give a measure of the precision associated with sample collection, preservation, and storage, as well as lab procedures.

3.8 FIELD REAGENT BLANK (FRB) – An aliquot of reagent water that is placed in a sample container in the laboratory and treated as a sample in all respects, including shipment to the sampling site, exposure to sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the FRB is to determine if method analytes or other interferences are present in the field environment.

3.9 INTERNAL STANDARD (IS) – A pure chemical added to an extract or standard solution in a known amount(s) and used to measure the relative response of other method analytes and surrogates that are components of the same solution. The internal standard must be a chemical that is structurally similar to the method analytes, has no potential to be present in samples, and is not a method analyte.

3.10 LABORATORY FORTIFIED BLANK (LFB) – A volume of reagent water or other blank matrix to which known quantities of the method analytes and all the preservation compounds are added in the laboratory. The LFB is analyzed exactly like a sample, and its purpose is to determine whether the methodology is in control, and whether the laboratory is capable of making accurate and precise measurements.

3.11 LABORATORY FORTIFIED SAMPLE MATRIX (LFSM) – A preserved field sample to which known quantities of the method analytes are added in the laboratory. The LFSM is processed and analyzed exactly like a sample, and its purpose is to determine whether the sample matrix contributes bias to the analytical results. The background concentrations of the analytes in the sample matrix must be determined in a separate sample extraction and the measured values in the LFSM corrected for background concentrations.

3.12 LABORATORY FORTIFIED SAMPLE MATRIX DUPLICATE (LFSMD) – A duplicate of the Field Sample used to prepare the LFSM. The LFSMD is fortified, extracted, and analyzed identically to the LFSM. The LFSMD is used instead of the Field Duplicate to assess method precision when the occurrence of method analytes is low.

3.13 LABORATORY REAGENT BLANK (LRB) – An aliquot of reagent water or other blank matrix that is treated exactly as a sample including exposure to all glassware, equipment, solvents and reagents, sample preservatives, internal standard, and surrogates that are used in the analysis batch. The LRB is used to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

3.14 LOWEST CONCENTRATION MINIMUM REPORTING LEVEL (LCMRL) – The single laboratory LCMRL is the lowest true concentration for which a future recoveryis expected, with 99% confidence, to be between 50 and 150% recovery.[1]

3.15 MINIMUM REPORTING LEVEL (MRL) – The minimum concentration that can be reported as a quantitated value for a method analyte in a sample following analysis. This defined concentration can be no lower than the concentration of the lowest calibration standard for that analyte and can only be used if acceptable QC criteria for this standard are met. A procedure for verifying a laboratory's MRL is provided in Section 9.2.5.

3.16 PRECURSOR ION – For the purpose of this method, the precursor ion is the deprotonated molecule ($[M-H]^-$) of the method analyte. In MS/MS, the precursor ion is mass selected and fragmented by collisionally activated dissociation to produce distinctive product ions of smaller *m/z*.

3.17 PRIMARY DILUTION STANDARD (PDS) SOLUTION – A solution containing the analytes prepared in the laboratory from stock standard solutions and diluted as needed to prepare calibration solutions and other needed analyte solutions.

3.18 PRODUCT ION – For the purpose of this method, a product ion is one of the fragment ions produced in MS/MS by collisionally activated dissociation of the precursor ion.

3.19 QUALITY CONTROL SAMPLE (QCS) – A solution of method analytes of known concentrations that is obtained from a source external to the laboratory and different from the source of calibration standards. The second source SSS is used to fortify the QCS at a known concentration. The QCS is used to check calibration standard integrity.

3.20 STOCK STANDARD SOLUTION (SSS) – A concentrated solution containing one or more method analytes prepared in the laboratory using assayed reference materials or purchased from a reputable commercial source.

3.21 SURROGATE ANALYTE (SUR) – A pure chemical which chemically resembles method analytes and is extremely unlikely to be found in any sample. This chemical is added to a sample aliquot in known amount(s) before processing and is measured with the same procedures used to measure other method analytes. The purpose of the SUR is to monitor method performance with each sample.

4. INTERFERENCES

LC-MS/MS data from blanks, samples, and spikes must be evaluated for interferences. If any interferences are present, take corrective action if necessary. Do not use aluminum foil because PFAAs can be potentially transferred from the aluminum foil to the glassware. Only aluminum foil rinsed with LC/MS grade methanol can be used where necessary.

4.1 PFAS have been used in a wide variety of manufacturing processes, and laboratory supplies should be considered potentially contaminated until they have been tested and shown to be otherwise. The materials and supplies used during the method validation process have been tested and shown to be clean. These items are listed in the Reagents section.

4.2 Method interferences may be caused by contaminants in solvents, reagents (including DI water), sample bottles and caps, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. All items such as these must be routinely demonstrated to be free from interferences (less than 1/2 the Reporting Limit), under the conditions of the analysis by analyzing Method Blanks. Subtracting blank values from sample results is not permitted.

4.3 PTFE products can be a source of PFAS (PFOA) contamination. The use of PTFE in the procedure should be avoided. Polypropylene (PP) or polyethylene (PE, HDPE) products may be used in place of PTFE products to minimize PFOA contamination.

4.3.1 Standards and samples are injected from polypropylene autosampler vials with polypropylene snap caps, once. Multiple injections may be performed on Primers when conditioning the instrument for analysis.

4.3.2 Random evaporation losses have been observed with the polypropylene caps causing high Internal Std. recovery after the vial was punctured and sample re-injected. For this reason, it is best to inject standards and samples once in the analytical sequence.

4.3.2 Teflon-lined screw caps have detected PFAS at low concentrations. Repeated injection from the same teflon-lined screw cap have detected PFNA at increasing concentration as each repeated injection was performed, therefore, it is best to use polypropylene snap caps.

4.4 LC/MS grade methanol must be used for all steps where methanol is used in this method.

4.5 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.

4.6 Solid phase extraction cartridges may 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. The Biotage Isolute 101 500 mg/6mL cartidges (SDVB) brand or Phenomenex SDVB have shown no interfering peaks/ions at the retention times of interest. Each new lot of SPE cartidges must be tested to ensure that contamination does not preclude analyte identification and quantitation.

4.6 Contamination by carryover can occur whenever a high-concentration and low concentration samples are sequentially analyzed. To reduce carryover, the sample syringe in automatically rinsed with solvent between injections. These operations are programmed into the LC multi-sampler system.

4.7 Volumetric glassware and syringes are difficult to clean after being used for solutions containing high levels of PFOA. These items should be labeled for use only with similarly concentrated solutions or verified clean prior to re-use. To the extent possible, disposable labware is used.

4.8 Both branched and linear PFAS isomers can potentially be found in the environment. Linear and branched isomers are known to exist for PFOS, PFOA, PFHxS, PFBS, Et-FOSAA, and MeFOSAA based upon the scientific literature. If multiple isomers are present for one of these PFAS they might be adjacent peaks that completely resolve or not, but usually with a deflection point resolved during peak integration. The later of these peaks matches the retention time of its labeled linear analog. In general, earlier peaks are the branched isomers and are not the result of peak splitting.

Currently, all these species are available as linear isomers. Reference standards of the technical mixtures for these specific PFAS are used to ensure that all appropriate peaks are included during peak integration. <u>These branched isomers elute before the linear isomer and are integrated and reported as total for those species.</u>

4.9 In an attempt to reduce PFOS bias, it is required that *m/z* 499>80 transition be used as the quantitation transition.

5. SAMPLE HANDLING

5.1 Aqueous samples are collected by our clients in 250 mL polypropylene bottles with polypropylene caps. For potable water samples the containers are charged with preservative: TRIZMA PRESET CRYSTALS, pH 7.0 Trizma® functions as a buffer, and removes free chlorine in chlorinated finished waters. Approx. 1.25 g. are added to 250 mL samples (5g/L).

5.2 FIELD REAGENT BLANKS (FRB)
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 preserved 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 PFAAs were not introduced into the sample during sample collection/handling.

5.3 SAMPLE SHIPMENT AND STORAGE – 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.

5.4 SAMPLE AND EXTRACT HOLDING TIMES – Results of the sample storage stability study (Table 10) indicated that all compounds listed in the EPA 537.1 method have adequate stability for 14 days when collected, preserved, shipped and stored as described. Therefore, water samples should be extracted within 14 days of collection. Extracts must be stored at room temperature and analyzed within 28 days after extraction.

6. APPARATUS AND MATERIALS

6.1 250 mL polypropylene bottles with polypropylene caps. VWR Scientific or equivalent: Part no. 414004-125, 12 pk. Alternate: White PP unlined lid L238WH and 8 oz. clarified PP single wall jar 70-400 neck, item J066-Containers and Packaging.com or equivalent.

6.2 Transport Tube: Virgin Polypropylene, White, Plastic, 10 mL Capacity, 16 mm OD, 93 mm Overall Lg, Self-Standing, 250 PK， Item 710Z420, Gamut.com (Grainger), with PP cap or equivalent.

6.3 Graduated cylinders, 50, 100, 250, 500 and 1000mL, Polypropylene, VWR Scientific or equivalent

6.4 Analytical Balance, 0.0001g., checked for accuracy each day of use with Class S weights, certified annually by an outside service

6.5 Extract concentrator: Organomation Model N-EVAP 112, 24 position concentrator with water batch control and nitrogen supply controls.

6.6 Syringes, polypropylene, luer lock, 50-100 mL for filtration of turbid groundwater samples. Merck XX110500 Fisher Scientific or equivalent

6.6 3.1 Micron in-line filters, Promochrom only

6.7 1.0 mL polypropylene snap cap vials, Agilent part no. 5182-0567

6.8 Snap caps, polypropylene, 11 mm, 11/9k, Agilent Part no. 5182-0542

6.9 Solid Phase Extraction Tubes: for EPA 537.1-Potable Water: SDVB- Biotage Isolute 101 500 mg/6mL cartidges (SDVB) part no. 101-0050-C or equivalent

6.10 Syringes, Hamilton or equivalent 5.0 uL, 10 uL 25 uL, 100 uL, 250 uL, 500 uL, teflon free

6.11 Solid Phase Extraction System-automated-Promochrom 8 position autosampler system for 6 mL capacity SPE tubes. System retrofit to remove all PTFE components and replaced with PEEK tubing or PFAS free tubing. Automated bottle rinsing feature required.

6.12 Nitrogen Evaporation System- Organomation Model N-EVAP 112-24 position evaporator with water bath and individual nitrogen delivery control. Water bath capable of ambient temperature to 85 C, but used at 55-60C.

6.13 LC/MS-MS system- Agilent 1260 HPLC system interfaced to an Agilent 6470A Triple Quadrupole system. The instrument control and qualitative/quantitative software is Mass Hunter versions B.8.0 and B.9.0 or later.

6.13.1 HPLC System-Agilent 1260 Infinity II

6.13.1.1 The Agilent 1260 Infinity II HPLC system is configured with temperature controlled column oven compartment. 4 column configuration, temperature controlled (refrigerated) auto sampler compartments, injection valve, proportioning valves, variable flow controls and variable injection capabilities.

6.13.1.2 The delay column (PFAS and other interference removal) is an Agilent Eclipse Plus C18, 4.6mm x 50 mm, 3.5 um-Part no. 959943-902

6.13.1.3 The analytical column is an Agilent ZORBAX Eclipse Plus C18, 3.0 x 50 mm, 1.8 um- part no. 959757-302

6.13.2 Agilent LC/MS-MS- Agilent 6470AAR

6.14.2.1 Agilent model 6470AAR triple Quadruploe system with Agilent Jet Stream ESI source. UHP nitrogen is used as cell gas and High purity nitrogen is delivered for the sheath gas from a Peak Scientific nitrogen generator system.

6.14 Vortex Mixer- Benchmark Industries or equivalent

6.15 SenSafe Free Chlorine test strips- VWR Scientific or equivalent

7. REAGENTS AND STANDARDS

ALL REAGENTS and STANDARDS MUST BE LOGGED INTO THE ELEMENT LIMS SYSTEM. This includes lot numbers, expiration, open and prepared dates, recipe, Certification/traceability documents from supplier(s) if provided and preparer.

7.1 Methanol, hypergrade for LC/MS. (Merck) from Sigma Aldrich Part no. 1060354000 or equivalent

7.2 Water, hypergrade for LC/MS. (Merck) from Sigma Aldrich Part no. 1153334000 or equivalent

7.3 Isopropanol-for rinsing valve seats, etc.- Sigma Aldrich Part no. 650447-1L

7.4 Ammonium Acetate, LC-MSMS grade. Sigma Aldrich Part no. 73594-100-G-F

7.5 Agilent Tuning Solution-ESI-L-Agilent Part no. G1969-85000

7.5 **Stock Standards**

Stock Standards are purchased in mid to high concentration form from Wellington Laboratories, Inc. Guelph, ONT, CA. Currently, Wellington is the only supplier of these materials. Second source standards to serve as an initial calibration verification are available for some of the target compounds from Absolute Standards, Hamden, CT in a

2000 ng/mL mix of linear isomers. If unavailable, use a separate preparation/lot from Wellington Labs.

7.5.1 Internal Standards used for the method described are M2PFOA, MPFOS and d3-N-MeFOSAA. These are purchased at 50,000 ng/mL levels and mixed for use. These are purchased from Wellington Labs in 1.2 mL volumes with the following part nos.: MPFOA, MPFOS, and d3-N-MeFOSAA.

7.5.2 Surrogate Materials are purchased for the method described from Wellington Labs at 50000 ng/mL levels. The part nos. are MPFHxA, MPFDA, and d5-N-EtFOSAA.

7.5.3 Stock Standard mixtures of both linear and branched plus linear isomers of the EPA 537 mix are purchase from Wellington Labs at 2000 ng/mL concentrations under part nos. EPA537PDS-L and EPA537-PDS.

The summary below details the procurement requirements for this method-All from Wellington Laboratories, Inc.:

Description	Part no.	Comes in
2000 ng/mL EPA 537.1 list targets	EPA 537 PDSL-R1	4 Days – 1.2 mL
1000-4000 ng/mL EPA 537 Surrogates	EPA 537-SS-R1	4 Days – 1.2 mL
1000, 3000, 4000 ug/mL EPA 537 Internal Stds	EPA-537IS	4 Days – 1.2 mL
Individual Standards @ 50 ug/mL for IS and SURR as alternative		4 Days – 1.2 mL
ISTD –MPFOS	MPFOS	
ISTD - M2PFOA	M2PFOA	
ISTD - d3-N-MeFOSAA	d3-N-MeFOSAA	
SURR – MPFHxA	MPFHxA	
SURR - M3HFPO-DA	M3HFPO-DA	
SURR – MPFDA	MPFDA	
SURR - d5-N-EtFOSAA	d5-N-EtFOSAA	

7.6 Preparation of Standards

7.6.1 Preparation of Working Standards and Intermediates from STOCK Materials

All stock standards are prepared by the vendor in methanol containing a bit of sodium hydroxide to prevent losses of target PFAS compounds due to potential esterification in methanolic solution. The stocks come prepared with 4 molar equivalents (a 3x excess) of sodium hydroxide for stocks at the 50 ug/mL levels. This insures their stability with respect to potential loss due to esterification. The basic solution insures that any acidic sites on the glass ampules or acidic impurities in the methanol are neutralized to prevent ester formation and forms the sodium salt of the PFAS to stabilize it.

When preparing any intermediate or working level standards, the dilution must be prepared in alkaline methanol to prevent the above from occurring.

In order to do this, prepare a 5.0 mM NaOH in Hypergrade Methanol (or LC/MSMS grade) by dissolving 0.02 g. of sodium hydroxide into 100 mL of MeOH. This has a 2 week life.

For standards that are made to 10 mL final volume, add 100 uL of 5.0 mM NaOH/MeOH as part of the preparation. This results in a final concentration of NaOH at 0.05 mM.

For Standards prepared to a final volume of 1.0 mL. add 10 uL of the 5.0 mM NaOH/MeOH.

For working calibration standards/CCVB/SVC made to 500 uL final volume, add 5 uL of the 5.0 mM NaOH/MeOH to each.

7.6.2 Storage of Standards

All working standards should be stored at room temperature provided the container are sealed properly.
Stock Standards may be stored at <10 deg. C but before using must sit to allow equilibration to room temperature followed by either vigorous vortex mixing or sonication for 3-5 mins.

7.6.3 Detailed Preparation Procedure-EPA 537.1 R1

7.6.4 Internal Standards

Option 1 -Internal Standards-purchased as a stock mixture at 1000-4000 ng/mL

These as transferred to a snap cap vial that has been pre-rinsed with 5 mM NaOH/MeOH then allowed to dry. Use as is adding 5 uL to 500 uL volumes or 3 uL to 300 uL volumes for samples or calibration.

Option 2- Internal standards-purchased at 50,000 ng/mL individual components

These as transferred to a snap cap vial that has been pre-rinsed with 5 mM NaOH/MeOH then allowed to dry. Then, dilutions are made to yield 1000, 3000 and 4000 ng/mL Levels for use. Dilutions are prepared as directed below.

For 1.0 mL final volume:

ISTD component	uL of 50,000 ng/mL Stock	uLof 5 mM NaOH/MeOH	uL MeOH
MPFOS, 2870 ng/mL	60 uL	10 uL	830 uL
M2PFOA, 1000 ng/mL	20 uL		
d3-N-MeFOSAA , 4000 ng/mL	80 uL		

7.6.5 Surrogates

7.6.5.1 Option 1 -Stock Surrogates purchased as a mixture at 1000-4000 ng/mL. These are transferred to a snap cap vial that has been pre-rinsed with 5 mM NaOH/MeOH then allowed to dry.
Prepare a 15 mL PP screw cap vial by pre-rinsing with 5 mM NaOH/MeOH then allowing to dry.

Prepare 10 mL of a 1:10 dilution to yield 100-400 ng/mL for use as follows:
Take 1.0 mL of the Surrogate Stock, plus 100 uL of 5 mM NaOH/MeOH and 8900 uL MeOH to give 10 mL final volume.

This results in the following concentrations of working surrogate mix which is used for all samples/QC (100 uL added) or used for calibration as directed under the Calibration section.

SURR – MPFHxA – 100 ng/mL
SURR - M3HFPO-DA - 100 ng/mL
SURR – MPFDA - 100 ng/mL
SURR - d5-N-EtFOSAA- 400 ng/mL

2.3.2.2 Option 2 – Stock individual Surrogates purchased at 50,000 ng/mL levels

SURR – MPFHxA – 50,000 ng/mL
SURR - M3HFPO-DA - 50,000 ng/mL
SURR – MPFDA - 50,000 ng/mL
SURR - d5-N-EtFOSAA- 50,000 ng/mL

These are received in glass ampules. The contents are transferred to snap cap vials that have been pre-rinsed with 5 mM NaOH/MeOH then allowed to dry.

The working surrogate mixture at 100-400 ng/mL is prepared in 10.0 mL quantity by diluting as directed below:

Surrogate	Amount	uL- Amount 5 mM NaOH/MeOH	uL MeOH
MFPHxA	20 uL	100	9760
M3HFPO-DA	20		
MPFDA	20		
d5-N-EtFOSAA	80		

7.6.6 Target Analytes- EPA 537.1 R1

The target analytes for this method are purchased commercially from Wellington Labs under part no. EPA 537 PDSL-R1 which contains the method target analytes as linear isomers only at a nominal concentration of 2000 ng/mL. This mixture is transferred from its glass ampule to a snap cap vial that has been pre-rinsed with 5 mM NaOH/MeOH then allowed to dry. Again these are the nominal concentrations and the actual anion concentrations for those present as salts is listed in the documentation and are reflected in both Mass Hunter and Element.

Preparation of a 10.0 mL volume for use at 100 ng/mL for both Laboratory Fortified Blanks (LFB/BS) and Laboratory Fortified Matrix (LFM/MS) and calibration is detailed below.

Rinse a 15 mL PP centrifuge tube with 5 mM NaOH/MeOH. Allow to dry. Add 100 uL of 5 mM NaOH/MeOH and 9400 uL of MeOH to the tube. Mix, then add 500 uL of the 2000 ng/mL EPA 537 PDSL-R1. Mix fully and this results in the 100 ng/mL solution used for BS/MS and Calibration for the analytes.

7.6.7 Calibration

Calibration of the LC-MSMS systems is done by a seven level calibration covering the range 0.25 ng/mL to 20 ng/mL, nominal. Various PFAS species are present as salts and at differing concentrations and these are reflected in Mass Hunter and Element as their actual concentrations. These are the nominal levels prepared: 0.25, 0.5, 1.0, 2.5, 5.0, 10.0, 20.0 ng/mL. These levels are prepared as directed below using the internal standards, surrogates and target analytes from above as directed below.

This is made to a final volume of 500 uL as shown below in 2 mL snap cap vials that have been pre-rinsed with 5 mM NaOH/MeOH then allowed to dry completely.

It is suggested that the stated volumes of methanol, 5mM NaOH/MeOH are mixed first in the snap caps, then the ISTD is added to each. Then the Surrogates added and finally the target analytes.

Based upon a final volume of 500 uL

Calibration Curve Preparation

Calibration Level	uL 100 ng/mL	uL 100 ng/mL Target Linear	uL 5 mM NaOH/	uL Methanol	uL ISTD at 1000-4000

	Surrogate mix	PFAS Analytes	MeOH		ng/mL
1 (0.25 ng/mL)*	1.25 uL	1.25 uL	5 uL	492.5 uL	5 uL
2 (0.50 ng/mL)	2.5	2.5	5	490.0	5
3 (1.0 ng/mL)	5.0	5.0	5	485.0	5
4 (2.5 ng/mL)	12.5	12.5	5	475.0	5
5 (5.0 ng/mL)*	25.0	25.0	5	445.0	5
6 (10.0 ng/mL)	50.0	50.0	5	395.0	5
7 (20.0 ng/mL)*	100.0	100.0	5	295.0	5

*These levels are also used as the LCV, CCV and HCV for each analysis sequence. Multiple vials should be prepared for these 3 levels.

7.6.8 Checking the Efficacy of the Surrogate/Spike Mixes

On a weekly basis the surrogate and spike mixes at 100 ng/mL are assayed to ensure stability. These are prepared for the analysis by taking 30 uL of the surrogate mix and 30 uL of the spike mix for a final volume of 300 uL as shown below. This yields a 1:10 dilution of the material.

Assay Preparation at 10 ng/mL nominal-prepare in PP auto sampler vial-final volume 300 uL + ISTD:

uL Methanol	uL 5 mM NaOH/MeOH	uL Surrogate at 100 ng/mL	uL Spike at 100 ng/mL	uL ISTD @ 1000-4000 ng/mL
237 uL	3 uL	30 uL	30 uL	3.0

7.6.9 Second Source - Initial Calibration Verification
EPA 537 mix at 2000 ng/mL is currently available form Absolute Standards, Hamden, CT , part no. 99206. This is prepared as an ICV as follows:

Initial Calibration Verification Preparation

Source-Absolute Standards EPA 537 Mix @ 2000 ng/mL

Preparation of Intermediate 100 ng/mL
Take 50 uL of Stock up to 1000 uL in MeOH = 100 ng/mL Intermediate

ICV Level @ 5.0 ng/mL
Take 25 uL of 100 ng/mL ICV Intermediate + 475 uL 95/5 MeOH/H2O + 5uL ISTDs-no Surrogates

8. PROCEDURE

8.1 Preventative and Routine Maintenance

HPLC/MS/MS Preventative Maintenance	
As Needed: Change pump seals. Change in-line filters in autosampler (HPLC). Check/replace in-line frit if excessive pressure or poor performance. Replace column if no change following in-line frit change. Clean needle. Replace or clean Capillary Replace fused silica tube in ESI interface. Clean lenses. Clean skimmer. Ballast rough pump 30 minutes. Check Nozzle flow pattern	**Daily (When in use)** Check solvent reservoirs for sufficient level of solvent. Verify that pump is primed, operating pulse free. (ripple < 1%) Check needle wash reservoir for sufficient solvent. Verify capillary heater temperature functioning. Verify vaporizer heater temperature. Verify rough pump oil levels. Verify turbo-pump functioning. Verify nitrogen pressure for auxiliary and sheath gasses. Possible Checktune
Semi-Annually Replace oil mist and odor elements. Replace activated alumina filter if applicable	**Annually** Vacuum system components including fans and fan covers. Clean/replace fan filters, if applicable.

8.2 Sample Preparation (Extraction and Concentration)

8.2.1 To measure sample initial volume mark a line at the meniscus present in the container. For each lab QC sample required, a clean sample bottle with Trizma® preservative should be filled to the near top and marked for initial volume measurement. Trizma is only used for potable water samples. This measurement serves as a backup since the Horizon Smart Prep II automatically measures the amount of aqueous sample processed and details the volume in the run report.

8.2.2 For every 20 field samples, a blank, a blank spike, and a blank spike duplicate must be extracted. (Field blanks are considered field samples in this consideration as they are treated as such) Ideally, if adequate sample volume is available, a duplicate and a matrix spike should be included on every batch.

8.2.3 All polypropylene equipment including graduated cylinders and sample transfer lines/reservoirs should be washed prior to using with extraction solvent (95:5 Methanol:water).

8.2.4 Add 100uL of surrogate to each sample and QC sample, recap and invert to mix well.

8.2.5 Add, 5, 50 or 100uL of spike to all BS (LFB) and 100 uL MS (LFM) samples included in the extraction batch.

8.2.6 Using the Promochrom automated system, run a cleaning run.

Be sure the reservoirs of LC/MS grade methanol and HPLC plus grade water are full. Prime all lines and align all components.

8.2.7. Load in the EPA537 method.

8.2.8 The SPE method parameters are listed in Figure 1.

Figure 1.0- Promochrom 537.1 SPE Parameters

Step	Action	Inlet	Flow (mL/Min)	Volume (mL)	Time (Mins)
1	Elute W2	CH3OH	5	5	
2	Wait (Soak)				1
3	Elute W2	CH3OH	3	5	
4	Wait (Soak)				1
5	Elute W2	CH3OH	3	5	
6	Wait (Soak)				2
7	Elute W1	H2O	5	18	
8	Wait (Soak)				1
9	Elute W1	H2O	5	5	
10	Wait				2
11	Add Sample W1	Sample	10	285*	
12	Rinse W1 (bottle rinse)	H2O	10	7.5	
13	Rinse W1 (bottle rinse)	H2O	10	7.5	
14	Add Sample W1 (line rinse)	Sample	10	4.5	
15	Elute W1 (prime)	CH3OH	10	0.2	
16	Air-Purge1 (dry tube)	Air	10	5	
17	Blow N_2 (dry tube)				5 @ (2.0 L/min)
18	Rinse 1 (Elute PFAS)	CH3OH	5	6	
19	Wait (Soak)				2
20	Rinse 1 (Elute)	CH3OH	5	6	
21	Wait (soak)				2
22	Collect 1 (final Elute step)	Sample	5	6	
23	Air-Purge1 (purge into collect)	Air	5	10	

*Maximum volume is based upon highest volume of sample in extraction batch

8.2.9 Place labeled 15 mL collection vessels in the sample collection tray and use Element labels to identify the vials at this point. Print 2 sets of labels for each since they will be used after the concentration step as well. These are graduated.

8.2.10 For Potable waters, check for free chlorine levels upon receipt using SenSafe free chlorine strips and show to be <0.1 ppm free chlorine before extraction. All samples above this limit should be rejected.

8.2.12 Add 100uL of Surrogate to each sample and QC sample and mix. Add 5 uL, 50 uL and 100 uL of the LFB (BS) depending upon the rotation of low, mid to high LFB. For LFM (MS) add 100 uL as the LFM for the batch.

8.2.13 Connect the bottles to the automated system..

8.2.14 Initiate the EPA537.1 Extraction Program as defined in Figure 1.0. Each run is approximately 1 hour 15 minutes. Draw a mark on each bottle and later measure the volume with a graduated cylinder. The actual sample volume extracted then entered into the Element Bench Sheet.

8.2.14 The resulting 10-14 mL extracts are transferred to the N-EVAP concentrator system operated at 50-55 degrees C (never more than 65C) in their original collection vials. The nitrogen flow is initiated and adjusted on each individual sample to provide a gentle stream causing a slight disturbance at the surface of the methanol extracts.

8.2.15 As this evaporation proceeds the walls of each vessel are rinsed with methanol when the volume is approximately 5 mls and then again when the volume is reduced to just below 1.0 mL. After these rinses, the evaporation is allowed to proceed until near dryness. At that point the walls of each sample vial are rinsed again with LC/MS grade Methanol and concentration allowed to proceed to dryness.

8.2.16 To each vial, add 1000 uL of 96%/4%Methanol/Water mix by swirling and using a disposable polypropylene pipet, vortex to mix, allow to settle then carefully transfer to a 2 mL PP snap cap.

8.2.17 Withdraw an aliquot of 300 uL into a 500 uL autos ampler vial (PP) and add 3.0 uL of ISTD mix. .

8.2.18 Cap with polyolefin flexible caps and vortex to mix.

8.2.19 Store Extracts at room temperature until analysis. If analysis is to proceed the next day or later, refrigerate at <10C.

8.3 Running Samples/QC - Acquisition Method

The acquisition method is detailed in Attachment 1 (HPLC) and Attachment 2 (MS/MS) of this SOP. The method is a HPLC with dynamic MRM method with precursor and

product ions with specific acquisition parameters to maximize sensitivity and specificity. This list may be modified to add other PFAS target analytes as necessary.
The Solid Phase Extraction Method (SPE) is detailed as Attachment 3.

8.3.1 The triple Quadrupole (QQQ) system must be optimized for each target analyte (including surrogates and internal standards) using the Mass Hunter Optimizer program. This program determines the most abundant precursor and product ions for each compound and their abundances. These data are then used to build an MRM (multiple reaction monitor) method for acquisition. This is done initially or after any major maintenance procedures are performed to the triple quadrupole system. A high level standard is used for this in the $[M\text{-}H]^-$ mode.

8.3.2 The QQQ is checked for tuning on a weekly basis before analysis using the Tune context by selecting the CHECKTUNE radio button. This is done only in negative ion mode since that what we are operating under. If the Checktune fails, run the Autotune program-note: this takes approx. 45 mins. in negative mode. This will require a calibration of the instrument.

8.3.3 Before any QC or samples can be run, the HPLC must be allowed to purge for at least thirty minutes. This purge must be done using the initial mobile phase conditions used in the method must be allowed to run for 15 minutes or until pressure has stabilized (ripple must be < 1%)

8.3.4 An instrument sequence (Worklist) is then made. It should begin with two primers (5 ng/mL) followed by a blank.

8.5.5 Those will be followed by the opening Low level CCC then mid level CCV. Then, the worklist can start running. Every 10 field samples (excluding QC and FRBs) a subsequent CCC must be run, alternating between medium and high CCVs (medium = 5 ng/mL, High = 20 ng/mL; Low CCV = 0.25 ng/mL). The sequence must end with a CCC in the rotation.

8.5.6 Following the run, a store column run must be entered, to ensure the column is stored in a high ratio of solvent.

8.5.7 The run can end with a script to put the instrument into standby mode.

8.4 Daily Sample Preparation/Analysis Sequence

- Prepare extracts for analysis by placing a 500 ul aliquot of sample extract containing internal standards into a PP auto-sampler vial. Apply snap cap.
- Confirm that the samples loaded on the auto-sampler were entered correctly in the injection log. Make any necessary corrections.

- Run instrument CCV checks at the RL (0.25 ng/mL), then at a mid level and high level rotating every ten samples (5, 20 ng/mL) and ending with a mid level CCV.
- Prepare samples by placing 100 ul of extract (diluted if necessary) into an auto-sampler vial. Add 2.0 ul 25 ppm Internal Standard to each.
- Enter the Worklist (injection sequence)into the instrument software and load samples onto the auto-sampler in the following order,

    - 2 Primers and a blank with ISTD
    - CCV conditioner @ 5 ng/mL
    - Low Level CCV (0.25 ng/mL)
    - Batch Method Blank
    - LFB
    - Sample Dup/LFM/LFMD
    - Samples to fill the 12-hour clock or 10 sample injections whichever is more frequent
    - CCV (ending or continuing) at 5.0 ng/mL
    - 10 injections
    - Ending CCV -High level, etc.

8.5 Data Review

The Agilent Mass Hunter Quantitation program is used to review all data. All identifications are based upon acceptable ion ratios for the abundance of both precursor and product ions along with retention time information.

8.5.1 Since certain PFAS species are manufactured by different processes the presence of branched as well as linear isomers may be found. In order to properly quantitate these species, the analyst must sum the related branched and linear isomers. This affects the following species: PFOS, PFHxS, N-EtFOSAA and N-MeFOSAA. These should be annotated as total in the quantitation report and subsequent Element outputs. This is accomplished by adding a Qualifier to these specific analytes. The specific qualifier is PFAS-T which says: "For this PFAS compound, the reported result is the Total of the linear and branched isomers".

EPA guidance on this is as follows:

1. Calibrate instrumentation using a certified quantitative standard containing only the linear isomer.

2. Identify the branched isomers by analyzing a "qualitative/semi-quantitative" PFOA mixed standard that includes both linear and branched isomers (Wellington Laboratories, cat#: T-PFOA or equivalent) and compare retention times and tandem mass spectrometry transitions.

3. Quantitate PFOA and the others by integrating the total response (i.e., accounting for peaks that are identified as linear and branched isomers) and relying on the initial calibration with the linear-isomer quantitative standard.

8.5.2 Any detection greater than the upper limit of the calibration curve requires dilution into the upper half of the curve, where possible.

9. CALIBRATION

9.1 Initial Calibration

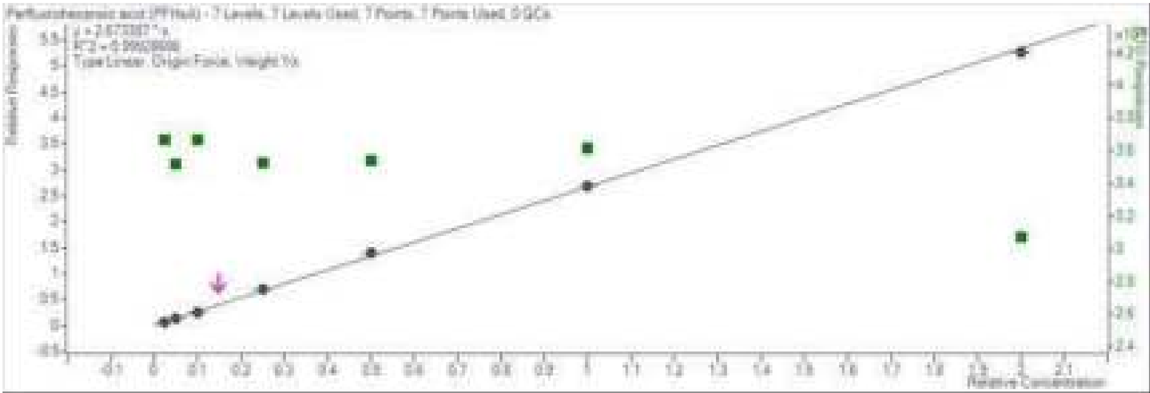
The initial calibration covers the range 0.25 ng/mL to 20 ng/mL or higher depending upon the linearity of the PFAS species. After acquisition, the data are quantitated in Mass Hunter and the default calibration model is generated using Quadratic regression , FORCED through the origin. Depending upon the response and accuracy at each level as shown in the Mass Hunter program, use Linear, Forced, weighted (1/x) or quadratic, Forced, with or without weighting to achieve the best fit which is based upon the best accuracy on a compound by compound basis. In any case, the correlation coefficient must be greater than 0.990.

9.1.1 The calibration levels as shown in Section 7.6.3 use 7 levels. All points are included in the calibration.

9.1.2 A typical calibration for a single compound showing responses and accuracy when quantitated against the curve is shown in Figure 2.0 below.

Figure 2.0 - Typical Calibration Accuracy Report and Curve

Initial Calibration	Perfluorohexanoic acid (PFHxA) Results			MPFOA (ISTD)
Name	RT, mins	Final Conc.	Accuracy	Area
SEQ-CAL1 0.25 ng/mL	10.3302	0.23	90.4	366519
SEQ-CAL2 0.50 ng/mL	10.2801	0.48	95.7	351967
SEQ-CAL3 1.00 ng/mL	10.3886	0.95	95.1	366588
SEQ-CAL4 2.50 ng/mL	10.3886	2.57	102.7	352457
SEQ-CAL5 5.00 ng/mL	10.3886	5.26	105.1	353774
SEQ-CAL6 10.0 ng/mL	10.3886	10.01	100.1	361544
SEQ-CAL7 20.0 ng/mL	10.3552	19.76	98.8	307426
BLANK	ND	ND < 0.25)	NA	365583
SEQ-SCV1 5.0 ng/mL	10.2801	5.12	102.5	360505



9.2 ICV/QCS

A second-source Initial Calibration Verification must be run immediately following initial calibration. The concentration of this standard should be in the middle of the calibration range (e.g. 5.0 ng/mL). Unless project-specific data quality objectives are required, the values from the second-source check should be within 30% of the expected concentration.

Corrective Action: Quantitative sample analyses should not proceed for a failing ICV. Recalibrate and re-run the ICV if necessary.

9.3 Continuing Calibration Verification

The first CCV must be at a level of 0.25 ng/mL (the RL level), followed by rotating mid-level (2.5-5.0 ng/mL) and high-level (10-20 ng/mL) CCVs every 10 client samples including a closing CCV.

The low level (MRL) CCV must be ± 50% of the true value (0.125-0.375 ng/mL). The mid-Level CCV must be ± 30% of the true value.

Corrective Action: If any of the required calibration check criteria fail, the system must be evaluated and any appropriate instrument repair or maintenance must be performed. Sample data are unacceptable and must be rerun. Reinjection the standard may be done. If the calibration check standard still fails, the system must be recalibrated.

10. Quality Control

10.1 Initial Demonstration of Capability (IDOC)

The initial demonstration requirement of EPA 537.1 must be acceptable before analysis of samples may begin. The IDOC includes the following key elements that are detailed in Sections 9.2.1 et seq. for EPA 537.1:

10.1.1 Initial Demonstration of Branched vs. Linear Isomer profile for PFOA

10.1.2 Initial Demonstration of Low system background

10.1.3 Initial Demonstration of Precision

10.1.4 Initial Demonstration of Accuracy

10.1.5 Initial Demonstration of Asymmetry Factor

10.1.6 MRL Confirmation

10.1.7 MDL Determination (initial and on-going). This is detailed in Section 10.1.7.1 below.

10.1.7.1 MDL Determination-Spike at 4 ng/L

MDL Determination –In order to perform the MDL study, 7 total extractions are performed on 3 different days (Extraction day 1= 3 LRBs and 3 LFBs); Extraction day 2 is 2 of each, and Extraction day 3 is also 2 of each). Once extracted, the analyses are conducted on 3 separate days (we use only QQQ1 so all runs are on that system). The MDL is determined according to the EPA MDL protocol defined in Definition and Procedure of the Determination of the Method Detection Limit, Revision 2 Dec. 2016 as detailed below:

Make all computations as specified in the analytical method and express the final results in the method-specified reporting units.

Calculate the sample standard deviation (SD) of the replicate spiked sample measurements and the sample standard deviation of the replicate method blank measurements from all instruments to which the MDL will be applied.

Compute the MDLs (the MDL based on spiked samples) as follows:

MDL_s = 3.143 x SD (for seven replicates; SD = Standard Deviation)

Compute the MDLb (MDL based on method blanks-LRBs) as follows:

- If none of the blanks give numerical results then the MDLb does not apply
- If only some of the blanks (but not all) give a result, set the MDLb to the highest result found
- If ALL method blanks show a detections then use the following calculation to determine MDLb:

MDLb = Average of Blank Detections + (3.143 x Std. Dev.)

Calculate the final MDL by selecting the greater of MDLs or MDLb.

10.2 Batches are defined at the sample preparation step. Batches should be kept together through the whole analytical process as far as possible, but it is not mandatory to analyze prepared extracts on the same instrument or in the same sequence.

10.2.1 The quality control batch is a set of up to 20 samples of the same matrix processed using the same procedure and reagents within the same time period. The quality control batch must contain a matrix spike/matrix spike duplicate (MS/MSD), a laboratory control sample (LCS) and a method blank. Laboratory generated QC samples (Blank, LCS, MS/MSD) do not count toward the maximum 20 samples in a batch. Field QC samples are included in the batch count. In some cases, at client request, the MS/MSD may be replaced with a matrix spike and sample duplicate. If insufficient sample is available for an MS/MSD, an LCSD may be substituted if batch precision is required by the program or client. In the event that multiple MS/MSDs are run with a batch due to client requirements, the additional MS/MSDs do not count toward the maximum 20 samples in a batch.

10.3 METHOD BLANK- One method blank (MB, laboratory reagent blank) must be extracted with every process batch of similar matrix, not to exceed twenty (20) samples. For aqueous samples, the method blank is an aliquot of laboratory reagent water. For solid samples, the method blank is an aliquot of Ottawa sand. The method blank is processed in the same manner and at the

same time as the associated samples. Corrective actions must be documented on a Non-Conformance memo, and then implemented when target analytes are detected in the method blank above the reporting limit or when IDA recoveries are outside of the control limits. Re-extraction of the blank, other batch QC, and the affected samples are required when the method blank is deemed unacceptable.

10.3.1 If the MB produces a peak within the retention time window of any of the analytes, determine the source of the contamination and eliminate the interference before processing samples.

10.3.2 The method blank must not contain any analyte at or above 1/3 the reporting limit- for EPA 537.1 potable waters.

10.3.3 If there is no target analyte greater than the RL in the samples associated with an unacceptable method blank, the data may be reported with qualifiers. Such action should be taken in consultation with the client.

10.3.4 Re-extraction and reanalysis of samples associated with an unacceptable method blank is required when reportable concentrations are determined in the samples.

10.3.5 Results are acceptable if the blank contamination is less than ½ of the reporting limit/LOQ for each analyte, or less than 1/10 of the regulatory limit, or less than 1/10 of the sample result for the same analyte, whichever is greater. If the method blank does not meet the acceptance criteria, the source of contamination must be investigated and measures taken to correct, minimize or eliminate the problem. Reprepare and reanalyze all field and QC samples associated with the contaminated method blank.

10.4 LABORATORY CONTROL SAMPLE (LCS) must be extracted with every process batch of similar matrix, not to exceed twenty (20) samples. The LCS is an aliquot of laboratory matrix (e.g. water for aqueous samples and Ottawa sand for solids) spiked with analytes of known identity and concentration. The LCS must be processed in the same manner and at the same time as the associated samples. Corrective actions must be documented on a Non-Conformance memo, then implemented when recoveries of any spiked analyte is outside of the control limits. Re-extraction of the blank, other batch QC, and all associated samples are required if the LCS is deemed unacceptable. The control limits for the LCS are stored in Element unless the method preempts this (537 limits).

10.5 A matrix spike/matrix spike duplicate (MS/MSD or MS/SD) pair must be extracted with every process batch of similar matrix, not to exceed twenty (20) samples. An MS/MSD pair is aliquots of a selected field sample spiked with analytes of known identity and concentration. The MS/MSD pair must be processed in the same manner and at the same time as the associated samples. Spiked analytes with recoveries or precision outside of the control limits must be within the control limits in the LCS. Corrective actions must be documented on a nonconformance memo, then implemented when recoveries of any spiked analyte are outside of the control limits provided by ELEMENT or by the client. Again if a specific method has required limits, this is preempted. Any outliers must be qualified accordingly.

10.6 A duplicate control sample (LCSD or DCS) may be added when insufficient sample volume is provided to process an MS/MSD pair, or is requested by the client. The LCSD is evaluated in the same manner as the LCS.

10.7 Initial calibration verification (ICV) –A second source standard is analyzed with the initial calibration curve. The concentration should be at the mid range of the curve and must recover within 80-120 % of expected value.

Corrective actions for the ICV include:

- Rerun the ICV.
- Remake or acquire a new ICV.
- Evaluate the instrument conditions.
- Evaluate the initial calibration standards.
- Rerun the initial calibration.

10.8 Internal Standard- The Internal Standard (IS) is added to each field and QC sample prior to analysis. The IS response (peak area) must not deviate by more than 50% from the average response (peak area) of the initial calibration.

10.8.1 Sample IS response (peak area) must be within 70-140% of the response (peak area) in the most recent CCV.

10.9 Specific QC requirements for EPA Method 537.1 are detailed in Table 1.0 as follows.

Table 1.0 QC Criteria-EPA 537.1

Requirement	**Specification and Frequency**	**Acceptance Criteria**
Sample Holding Time	14 days with appropriate preservation and storage as described in Sections 8.1-8.5.	Sample results are valid only if samples are extracted within sample hold time.
Extract Holding Time	28 days when stored room temp. in polypropylene centrifuge tubes	Sample results are valid only if extracts are analyzed within extract hold time.
Laboratory Reagent Blank (LRB)	One MBLK with each extraction batch of up to 20 Field Samples.	Demonstrate that the method analyte concentration < 1/3 the MRL, and confirm that possible interferences do not prevent quantification. If the background concentration exceeds 1/3 the MRL, results for the extraction batch are invalid.
Laboratory Fortified Blank (LFB)	One LFB is required for each extraction batch of up to 20 Field Samples. Rotate between low, mid, high levels	Results of LFB analyses at medium and High fortification for the analyte and SUR. Results of a low-level LFB must be 50-150% of the true value.
Internal Standard (IS)	Compare IS area to the average IS area in the initial calibration and the most recent CCC.	Peak area counts for all injections must be within ± 50% of the average peak area calculated during the initial cal. and 70–140% from the most recent CCC. If the IS does not meet this criterion, target analyte results are invalid.
Surrogate(SUR) Standard	The SUR standard added to all calibration standards and samples, including QC samples. Calculate SUR recoveries.	SUR recovery must be 70-130% of the true value. If a SUR fails this criterion, report all results for sample as suspect/SUR recovery with appropriate qualifier.

Sample Matrix Spike (LFSM)	Analyze one MS per extraction batch (of up to 20 Field Samples) fortified target analytes. Calculate LFSM recoveries.	Recoveries at mid-high levels should be 70-130%. For low level LFSM 50-150% is acceptance range. Qualify any outliers using appropriate flags.
MSD (LFSMD) or Field Duplicates (FD)	Extract at least one FD or LFSMD with each extraction batch of 20 field samples or less. Calculate RPD.	RPD should be ≤30% at mid-high spike levels and at low levels ≤ 50% RPD. If not met, qualify data accordingly.
Field Reagent Blank (FRB)	Required when any target analyte is detected above the MRL. Processed as a sample.	IF any target analyte is detected at > 1/3 the MRL, all samples collected are invalid and must be recollected/reanalyzed.
Peak Asymmetry Factor	Calc. this factor each time a new ICAL is done by evaluating the 1st two chromatographic peaks in the mid point of the curve.	The Peak asymmetry factor must be 0.8-1.5-Agilent Mass Hunter calculates this as a Symmetry Factor
Quality Control Sample (QCS)-SCV	Analyzed Quarterly or when preparing new standards as well as during initial demonstration.	70-130% of true value
Initial Calibration	Use ISTD technique first order or second order FORCED through zero (origin). Use minimum of 5 points or 6 points for 2nd order	When each standard is calculated against the curve, the accuracy should be 70-130%, except for the lowest standard which should be 50-150% of the true value.
Continuing Calibration Check (CCC) (or CCV)	Verify by running low std 1st then after every 10 runs, rotating between mid and high levels	Surrogates and analyte recovery 70-130% except for low level. For low level: 50-150% recovery for analytes and 70-130% recovery for surrogates.

10.10 Initial Demonstration of Capability (IDC)

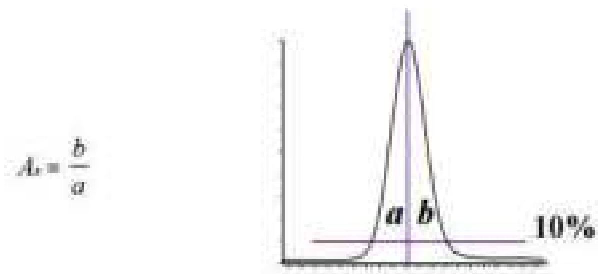
Initial Demonstration of Capability involves the following processes listed ion Table 2.0 as follows.

Table 2.0 - Initial Demonstration of Capability (IDC)

Requirement	**Specification**	**Acceptance Criteria**
Initial Demonstration of Low System Background *See EPA 537.1 Section 9.2.1*	Analyze LRB prior to any Other IDC steps	Demonstrate that all method analytes are < 1/3 MRL and possible interferences form extraction media do not prevent identification and quantification of method analytes.
Initial Demonstration of Precision (IDP) *See Section 9.2.2-*	Analyze 4-7 replicate LFBs at mid-cal level	%RSD must be < 20%
Initial Demonstration of Accuracy (IDA) *See Section 9.2.3-537.1*	Using the IDP runs above, Calc. average % Recovery	Mean Recovery ± 30% of true value

Initial Demonstration of Peak Asymmetry Factor	Calc. by evaluating the 1st two chromatographic peaks in the mid point of the curve. Equation in *Section 9.3.9 of EPA 537.1*	The Peak asymmetry factor must be 0.8-1.5 SEE FIGURE 3.0
Minimum Reporting Limit (MRL) Confirmation *See Section 9.2.5-537.1*	Fortify, extract and analyze seven replicates at the proposed MRL level. Calc. mean and the half range (HR). Confirm that the upper and lower limits for the prediction interval of result (Upper PIR and Lower PIR) meet recovery criteria.	Upper PIR $\leq$ 150% Lower PIR $\geq$ 50% SEE BELOW section 10.10.1 FOR CALCULATIONS

Figure 3.0 Peak Asymmetry Factor Determination



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.

Agilent Mass Hunter performs this calculation automatically as shown below:

			Perfluorobutanesulfonic acid (PFBS) Results				MPFOS (ISTD)		MPFHxA Results			
Acq. Date-Time	Dil.	Pos.	RT	Final Conc.	Accuracy	Symmetry	RT	Area	RT	Final Conc.	Accuracy	Symmetry
3/31/2021 7:06 PM	1.0	Vial 2	8.715	4.7070		1.17	13.954	96562	10.318	6.3196		1.40

10.10.1 <u>MINIMUM REPORTING LEVEL (MRL) CONFIRMATION</u> – Establish a target concentration for the MRL (0.25-0.5 ng/mL in extract- 1.0-2.0 ng/L in sample)for PFAS based on the intended use of the method. Fortify, extract, and analyze seven replicate LFBs at the proposed MRL concentration. Calculate the mean (*Mean*) and standard deviation for these replicates. Determine the Half Range for the prediction interval of results (*HRPIR*) using the equation below

$HR_{PIR} = 3.963S$

where *S* is the standard deviation, and 3.963 is the constant value for seven replicates.

NOTE: The mass spectrum (either SIM or full scan) for the method analyte in the LFBs must meet all the analyte identification criteria the MRL verification may not be performed on LFBs where only the base peak is observed. If during MRL confirmation all identification ions are not observed, the MRL selected is too low.

Confirm that the upper and lower limits for the Prediction Interval of Result (*PIR = Mean + HRPIR*) meet the upper and lower recovery limits as shown below.

The Upper PIR Limit must be ≤ 150% recovery.

$$\text{Upper PIR Limit} = \frac{\text{Mean} + \text{HRPIR}}{\text{Fortified Concentration}} \times 100\%$$

The Lower PIR Limit must be ≥ 50% recovery.

$$\text{Lower PIR Limit} = \frac{\text{Mean} - \text{HRPIR}}{\text{Fortified Concentration}} \times 100\%$$

The MRL is validated if both the Upper and Lower PIR Limits meet the criteria described above. If these criteria are not met, the MRL for PFAS has been set too low and must be re-evaluated at a higher concentration.

11.0 DATA REVIEW, CALCULATIONS AND REPORTING

Samples concentrations are determined using either or linear regression or quadratic regression FORCED through the origin. Weighted (1/x or $1/x^2$) may assist with low level accuracy and is recommended where necessary. All calibration curves have greater than 6 points and no points can be removed. Any target analyte exceeding the calibration range will require dilution.

11.1 Data interpretation

All sample data calculations are performed by the Agilent Mass Hunter software in ng/mL and then final data are calculated taking into account final extract volumes and the initial sample volumes extracted which are entered into the Element bench sheet.

11.2 Linear and Branched Isomers are addressed in Section 8.5 and are reported for the noted species as Total which is a sum of the linear and branched isomers for affected species.

12. HEALTH AND SAFETY

12.1 General safety considerations and requirements are detailed in the York Laboratory Safety and Health Standard Operating Procedure No. Safety011600.

Specific safety rules applying to the conduct of this analysis requiring the following:

- When handling standards and samples, latex gloves are required.
- Also, when handling neat materials, a fume hood and safety glasses are required.
- When handling samples, gloves and glasses are required.
- Highly odorous samples must be handled in a fume hood.
- Refer to SDSs for specific safety/health information.

12.2 The analysts must exercise normal care and be supervised and trained to work in an analytical chemistry laboratory. The analysts will be handling fragile glassware, needles, syringes, volatile and flammable chemicals, toxic chemicals and corrosive chemicals.

- No smoking or open flames are allowed.
- No food or food products may be brought into the laboratory.

Solvents should not be left uncovered on the laboratory benches.
All solvent transfers should be done in the hoods.

Hood doors must be kept in the position which yields approx. 100 fpm face velocity.
Solvent evaporation must be done in the hood with exhaust elevated and in the rear.

Waste containers that had solvents must be vented to a hood until all solvents have evaporated.

Safety glasses are provided and must be worn at all times in the laboratory.
Gloves are provided and must be worn when working with chemicals.
Laboratory coats are provided and should be worn to protect the analysts' clothes.
Syringes and needles must be kept in their original cases when not in use.
Care must be exercised in using and handling syringes to avoid injury.
Report any sticking with a needle immediately to your supervisor.

12.3 Specific Safety Concerns

12.3.1 Preliminary toxicity studies indicate that PFAS could have significant toxic effects. In the interest of keeping exposure levels as low as reasonably achievable, PFAS must be handled in the laboratory as hazardous and toxic chemicals.

12.3.2 Exercise caution when using syringes with attached filter disc assemblies. Application of excessive force has, upon occasion, caused a filter disc to burst during the process.

12.3.3 Laboratory procedures such as repetitive use of pipets, repetitive transferring of extracts and manipulation of filled separatory funnels and other glassware represent a significant potential for repetitive motion or other ergonomic injuries. Laboratory associates performing these procedures are in the best position to realize when they are at risk for these types of injuries.

12.3.4 Eye protection, laboratory coat, and nitrile gloves must be worn while handling samples, standards, solvents, and reagents. Disposable gloves that have been contaminated will be removed and discarded; other gloves will be cleaned immediately.

12.3.5 Perfluorocarboxylic acids are acids and are not compatible with strong bases.

12.3.6 Primary Materials Used- The following is a list of the materials used in this method, which have a serious or significant hazard rating. NOTE: This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table. A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Methanol (2-3-0)	Flammable Poison Irritant	200 ppm (TWA)	A slight irritant to the mucous membranes. Toxic effects exerted upon nervous system, particularly the optic nerve. Symptoms of overexposure may include headache, drowsiness and dizziness. Methyl alcohol is a defatting agent and may cause skin to become dry and cracked. Skin absorption can occur; symptoms may parallel inhalation exposure. Irritant to the eyes.

13. WASTE MANAGEMENT/POLLUTION PREVENTION

Neat Materials

Waste management procedures require the prudent use of neat materials. The ordering of neat standards and materials must be done to minimize unused material which would result in storage or handling of excess material. Quantities ordered should be sufficient to provide for necessary standards with consideration to shelf life. When ordering a unique material for a standard, be sure to order the smallest practical quantity.

Solvents

The solvents used at York for this procedure include isopropanol and Methanol. These solvents are used for sample extraction or LC cleanup, All amounts are either consumed during concentration or placed in one liter amber jars in the hood areas for evaporation. Any remaining solvent/water is transferred to a drum designated for solvent waste.

Samples
Unused or remaining soil and water samples are returned to the sample control room for continued storage for proper disposal by the sample control group.

14. REFERENCES

1. US EPA, "Method 537.1 - Determination of Selected Per- and Polyfluorinated alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometery (LC/MS/MS)", Version 1.0, November 2018, J.A. Shoemaker, P.E. Grimmett, B.K. Boutin, EPA Document #: EPA/600/R-18/352, and Version 2.0, March 2020 (the only updates were editorial and did not include any technical revisions).

2. Method ISO 25101:2009, "Determination of perfluorooctanesulfonate (PFOS) and perfluorooctanoate (PFOA) – Method for unfiltered samples using solid phase extraction and liquid chromatography/mass spectrometry", April 30, 2009.

3. EPA Technical Advisory-Laboratory Analysis of Drinking Water Samples for Perfluorooctanoic Acid (PFOA) using EPA Method 537 Rev. 1.1 EPA 815-B-16-021 September 2016

15. REVISION HISTORY

Revision 1.0	11/25/2018	First issue.
Revision 1.1	01/09/2019	Modified Cover page
Revision 1.2	03/30/2021	Modified Stds prep. Section 7 to reflect updated procedures
Revision 1.3	04/22/2021	Modified Reference 1 to reflect EPA 537.1

Attachment 1 -HPLC Method Parameters

Acquisition Method Report

	Channel	Name 1	Name 2	Selected	Used	Percent
1	A	Water 5mM ammonium acetate		Ch. 1	Yes	10.0 %
2	B	95% MeOH 5mM ammonium acetate		Ch. 1	Yes	90.0 %

Timetable

	Time	A	B	Flow
1	0.50 min	90.0 %	10.0 %	--- mL/min
2	2.00 min	70.0 %	30.0 %	--- mL/min
3	14.00 min	5.0 %	95.0 %	--- mL/min
4	14.50 min	0.0 %	100.0 %	--- mL/min

Name: Column Comp. **Module:** G7116A

Left Temperature Control

Temperature Control Mode	Temperature Set
Temperature	50.0 °C
Enable Analysis Left Temperature	
Enable Analysis Left Temperature On	Yes
Enable Analysis Left Temperature Value	0.8 °C
Left Temp. Equilibration Time	1.0 min
Right Temperature Control	
Right temperature Control Mode	Temperature Set
Right temperature	50.0 °C
Enable Analysis Right Temperature	
Enable Analysis Right Temperature On	Yes
Enable Analysis Right Temperature Value	0.8 °C
Right Temp. Equilibration Time	1.0 min
Enforce column for run	
Enforce column for run enabled	No
Stop Time	
Stoptime Mode	As pump/injector
Post Time	
Posttime Mode	Off
Timetable	
Valve Position	Position 1 (Port 1 -> 1')
Position Switch After Run	Do not switch

Attachment 2 - Triple Quadrupole Acquisition Method

Acquisition Method Report

YORK

Acquisition Method Info

Method Name	EPA537.1_041720_ACQ.m
Method Path	D:\MassHunter\Methods\EPA537.1_041720_ACQ.m
Method Description	Target PFAS Acquisition EPA537.1 PW

Device List

- Multisampler
- Binary Pump
- Column Comp.
- QQQ

MS QQQ Mass Spectrometer

Ion Source	AJS ESI	**Tune File**	D:\MassHunter\Tune\QQQ\G6470A \Autotune_20210106_152512\atunes_20210106_154847.TUNE.XML
Stop Mode	No Limit/As Pump	**Stop Time (min)**	1
Time Filter	On	**Time Filter Width (min)**	0.07
LC->Waste Pre Row	N/A	**LC->Waste Post Row**	N/A

Time Segments

Index	Start Time (min)	Scan Type	Ion Mode	Div Valve	Delta EMV	Store	Cycle Time (ms)	Triggered?	MRM Repeats
1	0	DynamicMRM	ESI+Agilent Jet Stream	To MS	325	Yes	500	No	1

Time Segment 1

Scan Segments

Cpd Name	ISTD?	Prec Ion	MS1 Res	Prod Ion	MS2 Res	Frag (V)	CE (V)	Cell Acc (V)	Ret Time (min)	Ret Window	Polarity
11CL-PF3OUdS	No	630.89	Unit/Enh (6490)	450.7	Unit/Enh (6490)	170	33	4	15.711	3	Negative
9CL-PF3ONS	No	530.89	Unit/Enh (6490)	350.7	Unit/Enh (6490)	175	29	4	14.471	3	Negative
ADONA	No	376.97	Unit/Enh (6490)	250.8	Unit/Enh (6490)	103	9	4	12.108	3	Negative
ADONA	No	376.97	Unit/Enh (6490)	84.9	Unit/Enh (6490)	103	37	4	12.108	3	Negative
d3-N-MeFOSAA	Yes	572.99	Unit/Enh (6490)	418.7	Unit/Enh (6490)	149	21	4	15.092	3	Negative
d5-N-EtFOSAA	No	589.02	Unit/Enh (6490)	530.8	Unit/Enh (6490)	156	21	4	15.427	3	Negative
d5-N-EtFOSAA	No	588.99	Unit/Enh (6490)	418.8	Unit/Enh (6490)	156	21	4	15.427	3	Negative
HFPO-DA (GenX)	No	285	Unit/Enh (6490)	169	Unit/Enh (6490)	100	20	4	11.076	3	Negative
M2PFOA	Yes	414.99	Unit/Enh (6490)	369.8	Unit/Enh (6490)	84	9	4	13.067	3	Negative
M3HFPO-DA	No	287	Unit/Enh (6490)	169	Unit/Enh (6490)	100	20	4	11.075	3	Negative
MPFDA	No	514.99	Unit/Enh (6490)	469.8	Unit/Enh (6490)	78	9	4	14.774	3	Negative
MPFHxA	No	314.99	Unit/Enh (6490)	269.8	Unit/Enh (6490)	89	5	4	10.601	3	Negative
MPFOS	Yes	502.99	Unit/Enh (6490)	79.8	Unit/Enh (6490)	180	40	4	14.009	2	Negative
N-EtFOSAA	No	584	Unit/Enh (6490)	525.9	Unit/Enh (6490)	130	20	4	15.436	3	Negative
N-EtFOSAA	No	584	Unit/Enh (6490)	418.8	Unit/Enh (6490)	130	20	4	15.436	3	Negative
N-MeFOSAA	No	570	Unit/Enh (6490)	511.9	Unit/Enh (6490)	150	20	4	15.101	3	Negative
N-MeFOSAA	No	570	Unit/Enh (6490)	418.9	Unit/Enh (6490)	150	20	4	15.101	3	Negative
Perfluorobutanesulfonic acid (PFBS)	No	298.9	Unit/Enh (6490)	79.9	Unit/Enh (6490)	150	38	4	9.091	3	Negative
Perfluorodecanoic acid (PFDA)	No	513	Unit/Enh (6490)	468.8	Unit/Enh (6490)	90	8	4	14.775	3	Negative
Perfluorodecanoic acid (PFDA)	No	513	Unit/Enh (6490)	268.8	Unit/Enh (6490)	90	16	4	14.775	3	Negative

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Acquisition Method Report

Cpd Name	ISTD?	Prec Ion	MS1 Res	Prod Ion	MS2 Res	Frag (V)	CE (V)	Cell Acc (V)	Ret Time (min)	Ret Window	Polarity
Perfluorododecanoic acid (PFDoA)	No	613	Unit/Enh (6490)	568.6	Unit/Enh (6490)	90	12	4	15.984	3	Negative
Perfluorododecanoic acid (PFDoA)	No	613	Unit/Enh (6490)	168.7	Unit/Enh (6490)	90	28	4	15.984	3	Negative
Perfluoroheptanoic acid (PFHpA)	No	363	Unit/Enh (6490)	318.8	Unit/Enh (6490)	90	8	4	11.968	3	Negative
Perfluoroheptanoic acid (PFHpA)	No	363	Unit/Enh (6490)	168.9	Unit/Enh (6490)	90	16	4	11.968	3	Negative
Perfluorohexanesulfonic acid (PFHxS)	No	398.9	Unit/Enh (6490)	98.8	Unit/Enh (6490)	150	40	4	12.015	3	Negative
Perfluorohexanesulfonic acid (PFHxS)	No	398.9	Unit/Enh (6490)	79.9	Unit/Enh (6490)	150	44	4	12.015	3	Negative
Perfluorohexanoic acid (PFHxA)	No	313	Unit/Enh (6490)	268.9	Unit/Enh (6490)	70	4	4	10.595	3	Negative
Perfluorohexanoic acid (PFHxA)	No	313	Unit/Enh (6490)	119	Unit/Enh (6490)	70	20	4	10.595	3	Negative
Perfluorononanoic acid (PFNA)	No	463	Unit/Enh (6490)	418.8	Unit/Enh (6490)	90	8	4	14.002	3	Negative
Perfluorononanoic acid (PFNA)	No	463	Unit/Enh (6490)	218.8	Unit/Enh (6490)	90	16	4	14.002	3	Negative
Perfluorooctanesulfonic acid (PFOS)	No	498.9	Unit/Enh (6490)	98.9	Unit/Enh (6490)	150	44	4	14.01	3	Negative
Perfluorooctanesulfonic acid (PFOS)	No	498.9	Unit/Enh (6490)	79.9	Unit/Enh (6490)	150	84	4	14.01	3	Negative
Perfluorooctanoic acid (PFOA)	No	413	Unit/Enh (6490)	368.8	Unit/Enh (6490)	90	8	4	13.087	3	Negative
Perfluorooctanoic acid (PFOA)	No	413	Unit/Enh (6490)	168.9	Unit/Enh (6490)	90	16	4	13.087	3	Negative
Perfluorotetradecanoic acid (PFTA)	No	713	Unit/Enh (6490)	669	Unit/Enh (6490)	110	12	4	16.843	3	Negative
Perfluorotetradecanoic acid (PFTA)	No	713	Unit/Enh (6490)	168.8	Unit/Enh (6490)	110	28	4	16.843	3	Negative
Perfluorotridecanoic acid (PFTrDA)	No	663	Unit/Enh (6490)	618.8	Unit/Enh (6490)	90	12	4	16.433	3	Negative
Perfluoroundecanoic acid (PFUnA)	No	563	Unit/Enh (6490)	519	Unit/Enh (6490)	90	8	4	15.421	3	Negative
Perfluoroundecanoic acid (PFUnA)	No	563	Unit/Enh (6490)	169	Unit/Enh (6490)	90	24	4	15.421	3	Negative

Scan Parameters

Data Stg	Threshold
Centroid	0

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Acquisition Method Report

Source Parameters

Parameter	Value (+)	Value (-)
Gas Temp (°C)	230	230
Gas Flow (l/min)	5	5
Nebulizer (psi)	35	35
SheathGasHeater	350	350
SheathGasFlow	12	12
Capillary (V)	3500	2500
VCharging	500	0

Chromatograms

Chrom Type	Label	Offset	Y-Range
TIC	TIC	0	10000000

Instrument Curves

Actual

Name: Multisampler	Module: G7167A
Sampling Speed	
Draw Speed	100.0 µL/min
Eject Speed	400.0 µL/min
Wait Time After Drawing	1.2 s
Injection	
Needle Wash Mode	Standard Wash
Injection Volume	5.00 µL
Standard Needle Wash	
Needle Wash Mode	Flush Port
Duration	10 s
High Throughput	
Injection Valve to Bypass for Delay Volume Reduction	No
Sample Flush-Out Factor	5.0
Overlapped Injection	
Overlap Injection Enabled	No
Needle Height Position	
Draw Position Offset	1.5 mm
Use Vial/Well Bottom Sensing	Yes
Stop Time	
Stoptime Mode	No Limit
Post Time	
Posttime Mode	Off

Name: Binary Pump	Module: G7112B
Flow	0.400 mL/min
Use Solvent Types	No
Low Pressure Limit	0.00 bar
High Pressure Limit	600.00 bar
Maximum Flow Gradient	100.000 mL/min²
Stroke A	
Automatic Stroke Calculation A	Yes
Stroke B	
Automatic Stroke Calculation B	Yes
Compress A	
Compressibility Mode A	Compressibility Value Set
Compressibility A	70 10e-6/bar
Compress B	
Compressibility Mode B	Compressibility Value Set
Compressibility B	90 10e-6/bar
Stop Time	
Stoptime Mode	Time set

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ATTACHMENT F

ELAP Certification
(York Analytical Laboratories, Inc.)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
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Revised April 04, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved analytes are listed below:

Acrylates	
Acrolein (Propenal)	EPA 8260D
	EPA 8260C
	EPA 624.1
Acrylonitrile	EPA 8260D
	EPA 8260C
	EPA 624.1
Methyl methacrylate	EPA 8260D
	EPA 8260C
Amines	
1,2-Diphenylhydrazine	EPA 8270D
	EPA 8270E
2-Nitroaniline	EPA 8270D
	EPA 8270E
3-Nitroaniline	EPA 8270D
	EPA 8270E
4-Chloroaniline	EPA 8270D
	EPA 8270E
4-Nitroaniline	EPA 8270D
	EPA 8270E
Aniline	EPA 625.1
	EPA 8270D
	EPA 8270E

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Amines	
Carbazole	EPA 625.1
	EPA 8270D
	EPA 8270E
Diphenylamine	EPA 8270D
	EPA 8270E
Pyridine	EPA 625.1
	EPA 8270D
	EPA 8270E
Benzidines	
3,3'-Dichlorobenzidine	EPA 625.1
	EPA 8270D
	EPA 8270E
Benzidine	EPA 625.1
	EPA 8270D
	EPA 8270E
Chlorinated Hydrocarbon Pesticides	
4,4'-DDD	EPA 8081B
	EPA 608.3
4,4'-DDE	EPA 8081B
	EPA 608.3
4,4'-DDT	EPA 8081B
	EPA 608.3

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Chlorinated Hydrocarbon Pesticides

Aldrin	EPA 8081B
	EPA 608.3
alpha-BHC	EPA 8081B
	EPA 608.3
alpha-Chlordane	EPA 8081B
beta-BHC	EPA 8081B
	EPA 608.3
Chlordane Total	EPA 8081B
	EPA 608.3
delta-BHC	EPA 8081B
	EPA 608.3
Dieldrin	EPA 8081B
	EPA 608.3
Endosulfan I	EPA 8081B
	EPA 608.3
Endosulfan II	EPA 8081B
	EPA 608.3
Endosulfan sulfate	EPA 8081B
	EPA 608.3
Endrin	EPA 8081B
	EPA 608.3
Endrin aldehyde	EPA 8081B
	EPA 608.3

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Chlorinated Hydrocarbon Pesticides

Endrin Ketone	EPA 8081B
gamma-Chlordane	EPA 8081B
Heptachlor	EPA 8081B
	EPA 608.3
Heptachlor epoxide	EPA 8081B
	EPA 608.3
Lindane	EPA 8081B
	EPA 608.3
Methoxychlor	EPA 8081B
	EPA 608.3
Mirex	EPA 8081B
Toxaphene	EPA 8081B
	EPA 608.3

Chlorinated Hydrocarbons

1,2,3-Trichlorobenzene	EPA 8260D
	EPA 8260C
1,2,4,5-Tetrachlorobenzene	EPA 8270D
	EPA 8270E
1,2,4-Trichlorobenzene	EPA 625.1
	EPA 8270D
	EPA 8270E
2-Chloronaphthalene	EPA 625.1

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Chlorinated Hydrocarbons

2-Chloronaphthalene	EPA 8270D
	EPA 8270E
Hexachlorobenzene	EPA 625.1
	EPA 8270D
	EPA 8270E
Hexachlorobutadiene	EPA 625.1
	EPA 8270D
	EPA 8270E
Hexachlorocyclopentadiene	EPA 625.1
	EPA 8270D
	EPA 8270E
Hexachloroethane	EPA 625.1
	EPA 8270D
	EPA 8270E
Pentachlorobenzene	EPA 8270D
	EPA 8270E

Chlorophenoxy Acid Pesticides

2,4,5-T	EPA 8151A
2,4,5-TP (Silvex)	EPA 8151A
	SM 6640B-2006
2,4-D	EPA 8151A
Dicamba	EPA 8151A

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Demand

Biochemical Oxygen Demand	SM 5210B-2016
Carbonaceous BOD	SM 5210B-2016
Chemical Oxygen Demand	SM 5220D-2011

Fuel Oxygenates

Di-isopropyl ether	EPA 8260D
	EPA 8260C
Ethanol	EPA 8260D
	EPA 8260C
Methyl tert-butyl ether	EPA 8260D
	EPA 8260C
tert-amyl alcohol	EPA 8260D
	EPA 8260C
tert-amyl methyl ether (TAME)	EPA 8260D
	EPA 8260C
tert-butyl alcohol	EPA 8260D
	EPA 8260C
tert-butyl ethyl ether (ETBE)	EPA 8260D
	EPA 8260C

Haloethers

2,2'-Oxybis(1-chloropropane)	EPA 625.1
	EPA 8270D
	EPA 8270E

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Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

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Haloethers	
4-Bromophenylphenyl ether	EPA 625.1
	EPA 8270D
	EPA 8270E
4-Chlorophenylphenyl ether	EPA 625.1
	EPA 8270D
	EPA 8270E
Bis(2-chloroethoxy)methane	EPA 625.1
	EPA 8270D
	EPA 8270E
Bis(2-chloroethyl)ether	EPA 625.1
	EPA 8270D
	EPA 8270E
Low Level Halocarbons	
1,2,3-Trichloropropane, Low Level	EPA 8011
1,2-Dibromo-3-chloropropane, Low Level	EPA 8011
1,2-Dibromoethane, Low Level	EPA 8011
Low Level Polynuclear Aromatics	
Acenaphthene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Acenaphthylene Low Level	EPA 8270D
	EPA 8270E

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Low Level Polynuclear Aromatics

Acenaphthylene Low Level	EPA 8270E SIM
Anthracene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Benzo(a)anthracene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Benzo(a)pyrene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Benzo(b)fluoranthene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Benzo(g,h,i)perylene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Benzo(k)fluoranthene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Chrysene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Dibenzo(a,h)anthracene Low Level	EPA 8270D

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Low Level Polynuclear Aromatics

Dibenzo(a,h)anthracene Low Level	EPA 8270E
	EPA 8270E SIM
Fluoranthene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Fluorene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Indeno(1,2,3-cd)pyrene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Naphthalene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Phenanthrene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM
Pyrene Low Level	EPA 8270D
	EPA 8270E
	EPA 8270E SIM

Metals I

Barium, Total	EPA 200.7, Rev. 4.4 (1994)

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Metals I

Barium, Total	EPA 6010C
	EPA 6010D
Cadmium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Calcium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
Chromium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Copper, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)

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Metals I

Iron, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Lead, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Magnesium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
Manganese, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Nickel, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C

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Metals I

Nickel, Total	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Potassium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
Silver, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Sodium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D

Metals II

Aluminum, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B

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Metals II

Aluminum, Total	EPA 200.8, Rev. 5.4 (1994)
Antimony, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Arsenic, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Beryllium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Chromium VI	EPA 7196A
	SM 3500-Cr B-2011
Mercury, Total	EPA 245.1, Rev. 3.0 (1994)
	EPA 245.2 (Issued 1974, Rev. 1983)

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CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved analytes are listed below:

Metals II

Mercury, Total	EPA 7470A
	EPA 7473
Selenium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
Vanadium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Zinc, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D

Metals III

Cobalt, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Molybdenum, Total	EPA 6020A

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Metals III	
Molybdenum, Total	EPA 200.8, Rev. 5.4 (1994)
Thallium, Total	EPA 200.7, Rev. 4.4 (1994)
	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
	EPA 200.8, Rev. 5.4 (1994)
Tin, Total	EPA 6020A
	EPA 200.8, Rev. 5.4 (1994)
Titanium, Total	EPA 6020A
	EPA 200.8, Rev. 5.4 (1994)
Mineral	
Alkalinity	SM 2320B-2011
Calcium Hardness	EPA 200.7, Rev. 4.4 (1994)
Chloride	EPA 300.0, Rev. 2.1 (1993)
Fluoride, Total	EPA 300.0, Rev. 2.1 (1993)
Hardness, Total	SM 2340B-2011
Sulfate (as SO4)	EPA 300.0, Rev. 2.1 (1993)
Miscellaneous	
Boron, Total	EPA 6020A
	EPA 200.8, Rev. 5.4 (1994)
Bromide	EPA 300.0, Rev. 2.1 (1993)

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Miscellaneous	
Color	SM 2120B-2011
Cyanide, Total	SM 4500-CN E-2016
Organic Carbon, Total	SM 5310C-2014
Phenols	EPA 420.1 (Rev. 1978)
Specific Conductance	EPA 120.1 (Rev. 1982)
Sulfide (as S)	SM 4500-S2- F-2011
Surfactant (MBAS)	SM 5540C-2011
Turbidity	EPA 180.1, Rev. 2.0 (1993)
Nitroaromatics and Isophorone	
2,4-Dinitrotoluene	EPA 625.1
	EPA 8270D
	EPA 8270E
2,6-Dinitrotoluene	EPA 625.1
	EPA 8270D
	EPA 8270E
Isophorone	EPA 625.1
	EPA 8270D
	EPA 8270E
Nitrobenzene	EPA 625.1
	EPA 8270D
	EPA 8270E

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Nitrosoamines	
N-Nitrosodimethylamine	EPA 625.1
	EPA 8270D
	EPA 8270E
N-Nitrosodi-n-propylamine	EPA 625.1
	EPA 8270D
	EPA 8270E
N-Nitrosodiphenylamine	EPA 625.1
	EPA 8270D
	EPA 8270E
Nutrient	
Ammonia (as N)	SM 4500-NH3 D-2011 or E-2011
Kjeldahl Nitrogen, Total	SM 4500-N Org D-2011
	SM 4500-NH3 D-2011 or E-2011
Nitrate (as N)	EPA 300.0, Rev. 2.1 (1993)
Nitrate-Nitrite (as N)	EPA 300.0, Rev. 2.1 (1993)
Nitrite (as N)	EPA 300.0, Rev. 2.1 (1993)
Orthophosphate (as P)	EPA 300.0, Rev. 2.1 (1993)
	SM 4500-P E-2011
Phosphorus, Total	SM 4500-P E-2011
Organophosphate Pesticides	
Atrazine	EPA 8270D
	EPA 8270E

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Organophosphate Pesticides	
Parathion ethyl	EPA 8270D
	EPA 8270E
Petroleum Hydrocarbons	
Diesel Range Organics	EPA 8015D
Gasoline Range Organics	EPA 8015D
Phthalate Esters	
Benzyl butyl phthalate	EPA 625.1
	EPA 8270D
	EPA 8270E
Bis(2-ethylhexyl) phthalate	EPA 625.1
	EPA 8270D
	EPA 8270E
Diethyl phthalate	EPA 625.1
	EPA 8270D
	EPA 8270E
Dimethyl phthalate	EPA 625.1
	EPA 8270D
	EPA 8270E
Di-n-butyl phthalate	EPA 625.1
	EPA 8270D
	EPA 8270E
Di-n-octyl phthalate	EPA 625.1

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Phthalate Esters	
Di-n-octyl phthalate	EPA 8270D
	EPA 8270E
Polychlorinated Biphenyls	
Aroclor 1016 (PCB-1016)	EPA 8082A
	EPA 608.3
Aroclor 1221 (PCB-1221)	EPA 8082A
	EPA 608.3
Aroclor 1232 (PCB-1232)	EPA 8082A
	EPA 608.3
Aroclor 1242 (PCB-1242)	EPA 8082A
	EPA 608.3
Aroclor 1248 (PCB-1248)	EPA 8082A
	EPA 608.3
Aroclor 1254 (PCB-1254)	EPA 8082A
	EPA 608.3
Aroclor 1260 (PCB-1260)	EPA 8082A
	EPA 608.3
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Polynuclear Aromatics	
Acenaphthene	EPA 625.1
	EPA 8270D

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Polynuclear Aromatics

Acenaphthene	EPA 8270E
Acenaphthylene	EPA 625.1
	EPA 8270D
	EPA 8270E
Anthracene	EPA 625.1
	EPA 8270D
	EPA 8270E
Benzo(a)anthracene	EPA 625.1
	EPA 8270D
	EPA 8270E
Benzo(a)pyrene	EPA 625.1
	EPA 8270D
	EPA 8270E
Benzo(b)fluoranthene	EPA 625.1
	EPA 8270D
	EPA 8270E
Benzo(g,h,i)perylene	EPA 625.1
	EPA 8270D
	EPA 8270E
Benzo(k)fluoranthene	EPA 625.1
	EPA 8270D
	EPA 8270E
Chrysene	EPA 625.1

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Polynuclear Aromatics

Chrysene	EPA 8270D
	EPA 8270E
Dibenzo(a,h)anthracene	EPA 625.1
	EPA 8270D
	EPA 8270E
Fluoranthene	EPA 625.1
	EPA 8270D
	EPA 8270E
Fluorene	EPA 625.1
	EPA 8270D
	EPA 8270E
Indeno(1,2,3-cd)pyrene	EPA 625.1
	EPA 8270D
	EPA 8270E
Naphthalene	EPA 625.1
	EPA 8270D
	EPA 8270E
Phenanthrene	EPA 625.1
	EPA 8270D
	EPA 8270E
Pyrene	EPA 625.1
	EPA 8270D
	EPA 8270E

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Priority Pollutant Phenols

2,3,4,6 Tetrachlorophenol	EPA 8270D
	EPA 8270E
2,4,5-Trichlorophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
2,4,6-Trichlorophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
2,4-Dichlorophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
2,4-Dimethylphenol	EPA 625.1
	EPA 8270D
	EPA 8270E
2,4-Dinitrophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
2-Chlorophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
2-Methyl-4,6-dinitrophenol	EPA 625.1
	EPA 8270D
	EPA 8270E

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Priority Pollutant Phenols

2-Methylphenol	EPA 625.1
	EPA 8270D
	EPA 8270E
2-Nitrophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
4-Chloro-3-methylphenol	EPA 625.1
	EPA 8270D
	EPA 8270E
4-Methylphenol	EPA 625.1
	EPA 8270D
	EPA 8270E
4-Nitrophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
Cresols, Total	EPA 8270D
	EPA 8270E
Pentachlorophenol	EPA 625.1
	EPA 8270D
	EPA 8270E
Phenol	EPA 625.1
	EPA 8270D
	EPA 8270E

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Residue	
Settleable Solids	SM 2540 F-2015
Solids, Total	SM 2540 B-2015
Solids, Total Dissolved	SM 2540 C-2015
Solids, Total Suspended	SM 2540 D-2015
Semi-Volatile Organics	
1,1'-Biphenyl	EPA 8270D
	EPA 8270E
1,2-Dichlorobenzene, Semi-volatile	EPA 8270D
	EPA 8270E
1,3-Dichlorobenzene, Semi-volatile	EPA 8270D
	EPA 8270E
1,4-Dichlorobenzene, Semi-volatile	EPA 8270D
	EPA 8270E
2-Methylnaphthalene	EPA 8270D
	EPA 8270E
Acetophenone	EPA 8270D
	EPA 8270E
alpha-Terpineol	EPA 625.1
	EPA 8270E
Benzaldehyde	EPA 8270D
	EPA 8270E
Benzoic Acid	EPA 8270D

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Semi-Volatile Organics

Benzoic Acid	EPA 8270E
Benzyl alcohol	EPA 8270D
	EPA 8270E
Caprolactam	EPA 8270D
	EPA 8270E
Dibenzofuran	EPA 8270D
	EPA 8270E

Volatile Aromatics

1,2,4-Trichlorobenzene, Volatile	EPA 8260D
	EPA 8260C
1,2,4-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,2-Dichlorobenzene	EPA 8260D
	EPA 8260C
	EPA 624.1
1,3,5-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,3-Dichlorobenzene	EPA 8260D
	EPA 8260C
	EPA 624.1
1,4-Dichlorobenzene	EPA 8260D
	EPA 8260C

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Volatile Aromatics

1,4-Dichlorobenzene	EPA 624.1
2-Chlorotoluene	EPA 8260D
	EPA 8260C
4-Chlorotoluene	EPA 8260D
	EPA 8260C
Benzene	EPA 8260D
	EPA 8260C
	EPA 624.1
Bromobenzene	EPA 8260D
	EPA 8260C
Chlorobenzene	EPA 8260D
	EPA 8260C
	EPA 624.1
Ethyl benzene	EPA 8260D
	EPA 8260C
	EPA 624.1
Isopropylbenzene	EPA 8260D
	EPA 8260C
m/p-Xylenes	EPA 8260D
	EPA 8260C
	EPA 624.1
Naphthalene, Volatile	EPA 8260D
	EPA 8260C

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Volatile Aromatics

n-Butylbenzene	EPA 8260D
	EPA 8260C
n-Propylbenzene	EPA 8260D
	EPA 8260C
o-Xylene	EPA 8260D
	EPA 8260C
	EPA 624.1
p-Isopropyltoluene (P-Cymene)	EPA 8260D
	EPA 8260C
sec-Butylbenzene	EPA 8260D
	EPA 8260C
Styrene	EPA 8260D
	EPA 8260C
	EPA 624.1
tert-Butylbenzene	EPA 8260D
	EPA 8260C
Toluene	EPA 8260D
	EPA 8260C
	EPA 624.1
Total Xylenes	EPA 8260D
	EPA 8260C
	EPA 624.1

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Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 8260D
	EPA 8260C
1,1,1-Trichloroethane	EPA 8260D
	EPA 8260C
	EPA 624.1
1,1,2,2-Tetrachloroethane	EPA 8260D
	EPA 8260C
	EPA 624.1
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA 8260D
	EPA 8260C
1,1,2-Trichloroethane	EPA 8260D
	EPA 8260C
	EPA 624.1
1,1-Dichloroethane	EPA 8260D
	EPA 8260C
	EPA 624.1
1,1-Dichloroethene	EPA 8260D
	EPA 8260C
	EPA 624.1
1,1-Dichloropropene	EPA 8260D
	EPA 8260C
1,2,3-Trichloropropane	EPA 8260D
	EPA 8260C

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Volatile Halocarbons

1,2-Dibromo-3-chloropropane	EPA 8260D
	EPA 8260C
1,2-Dibromoethane	EPA 8260D
	EPA 8260C
1,2-Dichloroethane	EPA 8260D
	EPA 8260C
	EPA 624.1
1,2-Dichloropropane	EPA 8260D
	EPA 8260C
	EPA 624.1
1,3-Dichloropropane	EPA 8260D
	EPA 8260C
2,2-Dichloropropane	EPA 8260D
	EPA 8260C
2-Chloroethylvinyl ether	EPA 8260D
	EPA 8260C
	EPA 624.1
Bromochloromethane	EPA 8260D
	EPA 8260C
Bromodichloromethane	EPA 8260D
	EPA 8260C
	EPA 624.1
Bromoform	EPA 8260D

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Volatile Halocarbons

Bromoform	EPA 8260C
	EPA 624.1
Bromomethane	EPA 8260D
	EPA 8260C
	EPA 624.1
Carbon tetrachloride	EPA 8260D
	EPA 8260C
	EPA 624.1
Chloroethane	EPA 8260D
	EPA 8260C
	EPA 624.1
Chloroform	EPA 8260D
	EPA 8260C
	EPA 624.1
Chloromethane	EPA 8260D
	EPA 8260C
	EPA 624.1
cis-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
	EPA 624.1
cis-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
	EPA 624.1

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120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES NON POTABLE WATER All approved analytes are listed below:

Volatile Halocarbons

Dibromochloromethane	EPA 8260D
	EPA 8260C
	EPA 624.1
Dibromomethane	EPA 8260D
	EPA 8260C
Dichlorodifluoromethane	EPA 8260D
	EPA 8260C
	EPA 624.1
Hexachlorobutadiene, Volatile	EPA 8260D
	EPA 8260C
Methylene chloride	EPA 8260D
	EPA 8260C
	EPA 624.1
Tetrachloroethene	EPA 8260D
	EPA 8260C
	EPA 624.1
trans-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
	EPA 624.1
trans-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
	EPA 624.1
trans-1,4-Dichloro-2-butene	EPA 8260D

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NEW YORK STATE DEPARTMENT OF HEALTH
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Volatile Halocarbons	
trans-1,4-Dichloro-2-butene	EPA 8260C
Trichloroethene	EPA 8260D
	EPA 8260C
	EPA 624.1
Trichlorofluoromethane	EPA 8260D
	EPA 8260C
	EPA 624.1
Vinyl chloride	EPA 8260D
	EPA 8260C
	EPA 624.1
Volatiles Organics	
1,4-Dioxane	EPA 8260D
	EPA 8260C
	EPA 8270D SIM
	EPA 8270E
	EPA 8270E SIM
2-Butanone (Methylethyl ketone)	EPA 8260D
	EPA 8260C
2-Hexanone	EPA 8260D
	EPA 8260C
4-Methyl-2-Pentanone	EPA 8260D
	EPA 8260C

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Volatiles Organics

Acetone	EPA 8260D
	EPA 8260C
Carbon Disulfide	EPA 8260D
	EPA 8260C
Cyclohexane	EPA 8260D
	EPA 8260C
Methyl acetate	EPA 8260D
	EPA 8260C
Methyl cyclohexane	EPA 8260D
	EPA 8260C
Vinyl acetate	EPA 8260D
	EPA 8260C

Sample Preparation Methods

	SM 4500-P B(5)-2011
	EPA 5030C
	SM 4500-CN B-2016 and C-2016
	EPA 3015A
	EPA 3010A
	EPA 3005A
	EPA 3510C
	SM 4500-N Org B-2011 or C-2011

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Fuel Additives	
Methyl tert-butyl ether	EPA 524.2
Naphthalene	EPA 524.2
Metals I	
Arsenic, Total	EPA 200.8 Rev. 5.4
Barium, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Cadmium, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Chromium, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Copper, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Iron, Total	EPA 200.7 Rev. 4.4
Lead, Total	EPA 200.8 Rev. 5.4
Manganese, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Mercury, Total	EPA 245.1 Rev. 3.0
Selenium, Total	EPA 200.8 Rev. 5.4
Silver, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Zinc, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4

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All approved analytes are listed below:

Metals II

Aluminum, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Antimony, Total	EPA 200.8 Rev. 5.4
Beryllium, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Molybdenum, Total	EPA 200.8 Rev. 5.4
Nickel, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4
Thallium, Total	EPA 200.8 Rev. 5.4
Vanadium, Total	EPA 200.7 Rev. 4.4
	EPA 200.8 Rev. 5.4

Metals III

Calcium, Total	EPA 200.7 Rev. 4.4
Magnesium, Total	EPA 200.7 Rev. 4.4
Potassium, Total	EPA 200.7 Rev. 4.4
Sodium, Total	EPA 200.7 Rev. 4.4

Miscellaneous

1,4-Dioxane	EPA 522
Turbidity	EPA 180.1 Rev. 2.0

Non-Metals

Alkalinity	SM 21-23 2320B (-97)
Calcium Hardness	EPA 200.7 Rev. 4.4

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Non-Metals	
Chloride	EPA 300.0 Rev. 2.1
Color	SM 21-23 2120B (-01)
Fluoride, Total	EPA 300.0 Rev. 2.1
Orthophosphate (as P)	EPA 300.0 Rev. 2.1
	SM 19, 21-23 4500-P E (-99)
Solids, Total Dissolved	SM 21-23 2540C (-97)
Specific Conductance	EPA 120.1 Rev. 1982
Sulfate (as SO4)	EPA 300.0 Rev. 2.1
Trihalomethanes	
Bromodichloromethane	EPA 524.2
Bromoform	EPA 524.2
Chloroform	EPA 524.2
Dibromochloromethane	EPA 524.2
Volatile Aromatics	
1,2,3-Trichlorobenzene	EPA 524.2
1,2,4-Trichlorobenzene	EPA 524.2
1,2,4-Trimethylbenzene	EPA 524.2
1,2-Dichlorobenzene	EPA 524.2
1,3,5-Trimethylbenzene	EPA 524.2
1,3-Dichlorobenzene	EPA 524.2
1,4-Dichlorobenzene	EPA 524.2
2-Chlorotoluene	EPA 524.2

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Volatile Aromatics

4-Chlorotoluene	EPA 524.2
Benzene	EPA 524.2
Bromobenzene	EPA 524.2
Chlorobenzene	EPA 524.2
Ethyl benzene	EPA 524.2
Hexachlorobutadiene	EPA 524.2
Isopropylbenzene	EPA 524.2
n-Butylbenzene	EPA 524.2
n-Propylbenzene	EPA 524.2
p-Isopropyltoluene (P-Cymene)	EPA 524.2
sec-Butylbenzene	EPA 524.2
Styrene	EPA 524.2
tert-Butylbenzene	EPA 524.2
Toluene	EPA 524.2
Total Xylenes	EPA 524.2

Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 524.2
1,1,1-Trichloroethane	EPA 524.2
1,1,2,2-Tetrachloroethane	EPA 524.2
1,1,2-Trichloroethane	EPA 524.2
1,1-Dichloroethane	EPA 524.2
1,1-Dichloroethene	EPA 524.2

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Volatile Halocarbons

1,1-Dichloropropene	EPA 524.2
1,2,3-Trichloropropane	EPA 524.2
1,2-Dichloroethane	EPA 524.2
1,2-Dichloropropane	EPA 524.2
1,3-Dichloropropane	EPA 524.2
2,2-Dichloropropane	EPA 524.2
Bromochloromethane	EPA 524.2
Bromomethane	EPA 524.2
Carbon tetrachloride	EPA 524.2
Chloroethane	EPA 524.2
Chloromethane	EPA 524.2
cis-1,2-Dichloroethene	EPA 524.2
cis-1,3-Dichloropropene	EPA 524.2
Dibromomethane	EPA 524.2
Dichlorodifluoromethane	EPA 524.2
Methylene chloride	EPA 524.2
Tetrachloroethene	EPA 524.2
trans-1,2-Dichloroethene	EPA 524.2
trans-1,3-Dichloropropene	EPA 524.2
Trichloroethene	EPA 524.2
Trichlorofluoromethane	EPA 524.2
Vinyl chloride	EPA 524.2

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All approved analytes are listed below:

Acrylates

Acrolein (Propenal)	EPA 8260D
	EPA 8260C
Acrylonitrile	EPA 8260D
	EPA 8260C
Methyl methacrylate	EPA 8260D
	EPA 8260C

Amines

1,2-Diphenylhydrazine	EPA 8270D
	EPA 8270E
2-Nitroaniline	EPA 8270D
	EPA 8270E
3-Nitroaniline	EPA 8270D
	EPA 8270E
4-Chloroaniline	EPA 8270D
	EPA 8270E
4-Nitroaniline	EPA 8270D
	EPA 8270E
Aniline	EPA 8270D
	EPA 8270E
Carbazole	EPA 8270D
	EPA 8270E
Diphenylamine	EPA 8270D

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Amines	
Diphenylamine	EPA 8270E
Benzidines	
3,3'-Dichlorobenzidine	EPA 8270D
	EPA 8270E
Benzidine	EPA 8270D
	EPA 8270E
Characteristic Testing	
Corrosivity (pH)	EPA 9045D
Free Liquids	EPA 9095B
Ignitability	EPA 1010A
Synthetic Precipitation Leaching Proc.	EPA 1312
TCLP	EPA 1311
Chlorinated Hydrocarbon Pesticides	
4,4'-DDD	EPA 8081B
4,4'-DDE	EPA 8081B
4,4'-DDT	EPA 8081B
Aldrin	EPA 8081B
alpha-BHC	EPA 8081B
alpha-Chlordane	EPA 8081B
Atrazine	EPA 8270D
	EPA 8270E
beta-BHC	EPA 8081B

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Chlorinated Hydrocarbon Pesticides

Chlordane Total	EPA 8081B
delta-BHC	EPA 8081B
Dieldrin	EPA 8081B
Endosulfan I	EPA 8081B
Endosulfan II	EPA 8081B
Endosulfan sulfate	EPA 8081B
Endrin	EPA 8081B
Endrin aldehyde	EPA 8081B
Endrin Ketone	EPA 8081B
gamma-Chlordane	EPA 8081B
Heptachlor	EPA 8081B
Heptachlor epoxide	EPA 8081B
Lindane	EPA 8081B
Methoxychlor	EPA 8081B
Mirex	EPA 8081B
Toxaphene	EPA 8081B

Chlorinated Hydrocarbons

1,2,3-Trichlorobenzene	EPA 8260D
	EPA 8260C
1,2,4,5-Tetrachlorobenzene	EPA 8270D
	EPA 8270E
1,2,4-Trichlorobenzene	EPA 8270D

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Chlorinated Hydrocarbons

1,2,4-Trichlorobenzene	EPA 8270E
2-Chloronaphthalene	EPA 8270D
	EPA 8270E
Hexachlorobenzene	EPA 8270D
	EPA 8270E
Hexachlorobutadiene	EPA 8270D
	EPA 8270E
Hexachlorocyclopentadiene	EPA 8270D
	EPA 8270E
Hexachloroethane	EPA 8270D
	EPA 8270E

Chlorophenoxy Acid Pesticides

2,4,5-T	EPA 8151A
2,4,5-TP (Silvex)	EPA 8151A
2,4-D	EPA 8151A
Dicamba	EPA 8151A

Haloethers

2,2'-Oxybis(1-chloropropane)	EPA 8270D
	EPA 8270E
4-Bromophenylphenyl ether	EPA 8270D
	EPA 8270E
4-Chlorophenylphenyl ether	EPA 8270D

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Haloethers

4-Chlorophenylphenyl ether	EPA 8270E
Bis(2-chloroethoxy)methane	EPA 8270D
	EPA 8270E
Bis(2-chloroethyl)ether	EPA 8270D
	EPA 8270E

Metals I

Barium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Cadmium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Calcium, Total	EPA 6010C
	EPA 6010D
Chromium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Copper, Total	EPA 6010C
	EPA 6010D

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Metals I

Copper, Total	EPA 6020A
	EPA 6020B
Iron, Total	EPA 6010C
	EPA 6010D
Lead, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Magnesium, Total	EPA 6010C
	EPA 6010D
Manganese, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Nickel, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Potassium, Total	EPA 6010C
	EPA 6010D
Silver, Total	EPA 6010C
	EPA 6010D
	EPA 6020A

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Metals I

Silver, Total	EPA 6020B
Sodium, Total	EPA 6010C
	EPA 6010D

Metals II

Aluminum, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Antimony, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Arsenic, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Beryllium, Total	EPA 6010C
	EPA 6010D
Chromium VI	EPA 7196A
Mercury, Total	EPA 7471B
	EPA 7473
Selenium, Total	EPA 6010C

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Metals II

Selenium, Total	EPA 6010D
	EPA 6020A
	EPA 6020B
Vanadium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Zinc, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B

Metals III

Cobalt, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Molybdenum, Total	EPA 6020A
Thallium, Total	EPA 6010C
	EPA 6010D
	EPA 6020A
	EPA 6020B
Tin, Total	EPA 6020A

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Metals III	
Tin, Total	EPA 6020B
Titanium, Total	EPA 6020A
Miscellaneous	
Boron, Total	EPA 6020A
	EPA 6020B
Cyanide, Total	EPA 9014
Extractable Organic Halides	EPA 9023
Nitroaromatics and Isophorone	
2,4-Dinitrotoluene	EPA 8270D
	EPA 8270E
2,6-Dinitrotoluene	EPA 8270D
	EPA 8270E
Isophorone	EPA 8270D
	EPA 8270E
Nitrobenzene	EPA 8270D
	EPA 8270E
Pyridine	EPA 8270D
	EPA 8270E
Nitrosoamines	
N-Nitrosodimethylamine	EPA 8270D
	EPA 8270E
N-Nitrosodi-n-propylamine	EPA 8270D

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All approved analytes are listed below:

Nitrosoamines	
N-Nitrosodi-n-propylamine	EPA 8270E
N-Nitrosodiphenylamine	EPA 8270D
	EPA 8270E
Organophosphate Pesticides	
Parathion ethyl	EPA 8270D
	EPA 8270E
Petroleum Hydrocarbons	
Diesel Range Organics	EPA 8015D
Gasoline Range Organics	EPA 8015D
Phthalate Esters	
Benzyl butyl phthalate	EPA 8270D
	EPA 8270E
Bis(2-ethylhexyl) phthalate	EPA 8270D
	EPA 8270E
Diethyl phthalate	EPA 8270D
	EPA 8270E
Dimethyl phthalate	EPA 8270D
	EPA 8270E
Di-n-butyl phthalate	EPA 8270D
	EPA 8270E
Di-n-octyl phthalate	EPA 8270D
	EPA 8270E

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

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CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1016 (PCB-1016) in Oil	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1221 (PCB-1221) in Oil	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1232 (PCB-1232) in Oil	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1242 (PCB-1242) in Oil	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1248 (PCB-1248) in Oil	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1254 (PCB-1254) in Oil	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1260 (PCB-1260) in Oil	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1262 (PCB-1262) in Oil	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Aroclor 1268 (PCB-1268) in Oil	EPA 8082A

Polynuclear Aromatic Hydrocarbons

Acenaphthene	EPA 8270D
	EPA 8270E
Acenaphthylene	EPA 8270D

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Polynuclear Aromatic Hydrocarbons

Acenaphthylene	EPA 8270E
Anthracene	EPA 8270D
	EPA 8270E
Benzo(a)anthracene	EPA 8270D
	EPA 8270E
Benzo(a)pyrene	EPA 8270D
	EPA 8270E
Benzo(b)fluoranthene	EPA 8270D
	EPA 8270E
Benzo(g,h,i)perylene	EPA 8270D
	EPA 8270E
Benzo(k)fluoranthene	EPA 8270D
	EPA 8270E
Chrysene	EPA 8270D
	EPA 8270E
Dibenzo(a,h)anthracene	EPA 8270D
	EPA 8270E
Fluoranthene	EPA 8270D
	EPA 8270E
Fluorene	EPA 8270D
	EPA 8270E
Indeno(1,2,3-cd)pyrene	EPA 8270D
	EPA 8270E

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Polynuclear Aromatic Hydrocarbons

Naphthalene	EPA 8270D
	EPA 8270E
Phenanthrene	EPA 8270D
	EPA 8270E
Pyrene	EPA 8270D
	EPA 8270E

Priority Pollutant Phenols

2,3,4,6 Tetrachlorophenol	EPA 8270D
	EPA 8270E
2,4,5-Trichlorophenol	EPA 8270D
	EPA 8270E
2,4,6-Trichlorophenol	EPA 8270D
	EPA 8270E
2,4-Dichlorophenol	EPA 8270D
	EPA 8270E
2,4-Dimethylphenol	EPA 8270D
	EPA 8270E
2,4-Dinitrophenol	EPA 8270D
	EPA 8270E
2-Chlorophenol	EPA 8270D
	EPA 8270E
2-Methyl-4,6-dinitrophenol	EPA 8270D

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Priority Pollutant Phenols

2-Methyl-4,6-dinitrophenol	EPA 8270E
2-Methylphenol	EPA 8270D
	EPA 8270E
2-Nitrophenol	EPA 8270D
	EPA 8270E
4-Chloro-3-methylphenol	EPA 8270D
	EPA 8270E
4-Methylphenol	EPA 8270D
	EPA 8270E
4-Nitrophenol	EPA 8270D
	EPA 8270E
Pentachlorophenol	EPA 8270D
	EPA 8270E
Phenol	EPA 8270D
	EPA 8270E

Semi-Volatile Organics

1,1'-Biphenyl	EPA 8270D
	EPA 8270E
1,2-Dichlorobenzene, Semi-volatile	EPA 8270D
	EPA 8270E
1,3-Dichlorobenzene, Semi-volatile	EPA 8270D
	EPA 8270E

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Semi-Volatile Organics

1,4-Dichlorobenzene, Semi-volatile	EPA 8270D
	EPA 8270E
2-Methylnaphthalene	EPA 8270D
	EPA 8270E
Acetophenone	EPA 8270D
	EPA 8270E
Benzaldehyde	EPA 8270D
	EPA 8270E
Benzoic Acid	EPA 8270D
	EPA 8270E
Benzyl alcohol	EPA 8270D
	EPA 8270E
Caprolactam	EPA 8270D
	EPA 8270E
Dibenzofuran	EPA 8270D
	EPA 8270E

Volatile Aromatics

1,2,4-Trichlorobenzene, Volatile	EPA 8260D
	EPA 8260C
1,2,4-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,2-Dichlorobenzene	EPA 8260D

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Volatile Aromatics

1,2-Dichlorobenzene	EPA 8260C
1,3,5-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,3-Dichlorobenzene	EPA 8260D
	EPA 8260C
1,4-Dichlorobenzene	EPA 8260D
	EPA 8260C
2-Chlorotoluene	EPA 8260D
	EPA 8260C
4-Chlorotoluene	EPA 8260D
	EPA 8260C
Benzene	EPA 8260D
	EPA 8260C
Bromobenzene	EPA 8260D
	EPA 8260C
Chlorobenzene	EPA 8260D
	EPA 8260C
Ethyl benzene	EPA 8260D
	EPA 8260C
Isopropylbenzene	EPA 8260D
	EPA 8260C
m/p-Xylenes	EPA 8260D
	EPA 8260C

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Volatile Aromatics

Naphthalene, Volatile	EPA 8260D
	EPA 8260C
n-Butylbenzene	EPA 8260D
	EPA 8260C
n-Propylbenzene	EPA 8260D
	EPA 8260C
o-Xylene	EPA 8260D
	EPA 8260C
p-Isopropyltoluene (P-Cymene)	EPA 8260D
	EPA 8260C
sec-Butylbenzene	EPA 8260D
	EPA 8260C
Styrene	EPA 8260D
	EPA 8260C
tert-Butylbenzene	EPA 8260D
	EPA 8260C
Toluene	EPA 8260D
	EPA 8260C
Total Xylenes	EPA 8260D
	EPA 8260C

Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 8260D

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Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 8260C
1,1,1-Trichloroethane	EPA 8260D
	EPA 8260C
1,1,2,2-Tetrachloroethane	EPA 8260D
	EPA 8260C
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA 8260D
	EPA 8260C
1,1,2-Trichloroethane	EPA 8260D
	EPA 8260C
1,1-Dichloroethane	EPA 8260D
	EPA 8260C
1,1-Dichloroethene	EPA 8260D
	EPA 8260C
1,1-Dichloropropene	EPA 8260D
	EPA 8260C
1,2,3-Trichloropropane	EPA 8260D
	EPA 8260C
1,2-Dibromo-3-chloropropane	EPA 8260D
	EPA 8260C
1,2-Dibromoethane	EPA 8260D
	EPA 8260C
1,2-Dichloroethane	EPA 8260D
	EPA 8260C

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Volatile Halocarbons

1,2-Dichloropropane	EPA 8260D
	EPA 8260C
1,3-Dichloropropane	EPA 8260D
	EPA 8260C
2,2-Dichloropropane	EPA 8260D
	EPA 8260C
2-Chloroethylvinyl ether	EPA 8260D
	EPA 8260C
Bromochloromethane	EPA 8260D
	EPA 8260C
Bromodichloromethane	EPA 8260D
	EPA 8260C
Bromoform	EPA 8260D
	EPA 8260C
Bromomethane	EPA 8260D
	EPA 8260C
Carbon tetrachloride	EPA 8260D
	EPA 8260C
Chloroethane	EPA 8260D
	EPA 8260C
Chloroform	EPA 8260D
	EPA 8260C
Chloromethane	EPA 8260D

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Volatile Halocarbons

Chloromethane	EPA 8260C
cis-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
cis-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
Dibromochloromethane	EPA 8260D
	EPA 8260C
Dibromomethane	EPA 8260D
	EPA 8260C
Dichlorodifluoromethane	EPA 8260D
	EPA 8260C
Hexachlorobutadiene, Volatile	EPA 8260D
	EPA 8260C
Tetrachloroethene	EPA 8260D
	EPA 8260C
trans-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
trans-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
Trichloroethene	EPA 8260D
	EPA 8260C
Trichlorofluoromethane	EPA 8260D
	EPA 8260C

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Volatile Halocarbons	
Vinyl chloride	EPA 8260D
	EPA 8260C
Volatile Organics	
1,4-Dioxane	EPA 8260D
	EPA 8260C
	EPA 8270D SIM
	EPA 8270E
	EPA 8270E SIM
2-Butanone (Methylethyl ketone)	EPA 8260D
	EPA 8260C
2-Hexanone	EPA 8260D
	EPA 8260C
4-Methyl-2-Pentanone	EPA 8260D
	EPA 8260C
Acetone	EPA 8260D
	EPA 8260C
Carbon Disulfide	EPA 8260D
	EPA 8260C
Cyclohexane	EPA 8260D
	EPA 8260C
Methyl acetate	EPA 8260D
	EPA 8260C

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Volatile Organics

Methyl cyclohexane	EPA 8260D
	EPA 8260C
Methyl tert-butyl ether	EPA 8260D
	EPA 8260C
tert-butyl alcohol	EPA 8260D
	EPA 8260C
Vinyl acetate	EPA 8260D
	EPA 8260C

Sample Preparation Methods

	EPA 5035A-L
	EPA 5035A-H
	EPA 3580A
	EPA 3010A
	EPA 3050B
	EPA 3550C
	EPA 3546
	EPA 3545A
	EPA 3060A
	EPA 9010C

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ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Lead in Paint	EPA 6010C

Sample Preparation Methods

EPA 3050B

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MR. JON WALSH
YORK ANALYTICAL LABORATORIES, INC. (II)
132-02 89TH AVENUE SUITE 217
RICHMOND HILL, NY 11418

NY Lab Id No: 12058

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES AIR AND EMISSIONS All approved analytes are listed below:

Acrylates	
Acrylonitrile	EPA TO-15
Methyl methacrylate	EPA TO-15
Chlorinated Hydrocarbons	
1,2,4-Trichlorobenzene	EPA TO-15
Hexachlorobutadiene	EPA TO-15
Hexachloroethane	EPA TO-15
Purgeable Aromatics	
1,2,4-Trimethylbenzene	EPA TO-15
1,2-Dichlorobenzene	EPA TO-15
1,3,5-Trimethylbenzene	EPA TO-15
1,3-Dichlorobenzene	EPA TO-15
1,4-Dichlorobenzene	EPA TO-15
Benzene	EPA TO-15
Chlorobenzene	EPA TO-15
Ethyl benzene	EPA TO-15
Isopropylbenzene	EPA TO-15
m/p-Xylenes	EPA TO-15
o-Xylene	EPA TO-15
Styrene	EPA TO-15
Toluene	EPA TO-15
Total Xylenes	EPA TO-15

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Purgeable Halocarbons

1,1,1-Trichloroethane	EPA TO-15
1,1,2,2-Tetrachloroethane	EPA TO-15
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA TO-15
1,1,2-Trichloroethane	EPA TO-15
1,1-Dichloroethane	EPA TO-15
1,1-Dichloroethene	EPA TO-15
1,2-Dibromoethane	EPA TO-15
1,2-Dichloroethane	EPA TO-15
1,2-Dichloropropane	EPA TO-15
3-Chloropropene (Allyl chloride)	EPA TO-15
Bromodichloromethane	EPA TO-15
Bromoform	EPA TO-15
Bromomethane	EPA TO-15
Carbon tetrachloride	EPA TO-15
Chloroethane	EPA TO-15
Chloroform	EPA TO-15
Chloromethane	EPA TO-15
cis-1,2-Dichloroethene	EPA TO-15
cis-1,3-Dichloropropene	EPA TO-15
Dibromochloromethane	EPA TO-15
Dichlorodifluoromethane	EPA TO-15
Methylene chloride	EPA TO-15
Tetrachloroethene	EPA TO-15

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All approved analytes are listed below:

Purgeable Halocarbons	
trans-1,2-Dichloroethene	EPA TO-15
trans-1,3-Dichloropropene	EPA TO-15
Trichloroethene	EPA TO-15
Trichlorofluoromethane	EPA TO-15
Vinyl bromide	EPA TO-15
Vinyl chloride	EPA TO-15
Volatile Chlorinated Organics	
Benzyl chloride	EPA TO-15
Volatile Organics	
1,2-Dichlorotetrafluoroethane	EPA TO-15
1,3-Butadiene	EPA TO-15
1,4-Dioxane	EPA TO-15
2-Butanone (Methylethyl ketone)	EPA TO-15
4-Methyl-2-Pentanone	EPA TO-15
Acetone	EPA TO-15
Carbon Disulfide	EPA TO-15
Cyclohexane	EPA TO-15
Hexane	EPA TO-15
Isopropanol	EPA TO-15
Methyl tert-butyl ether	EPA TO-15
n-Heptane	EPA TO-15
Vinyl acetate	EPA TO-15

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132-02 89TH AVENUE SUITE 217
RICHMOND HILL, NY 11418

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All approved analytes are listed below:

Acrylates	
Acrolein (Propenal)	EPA 8260D
	EPA 8260C
Acrylonitrile	EPA 8260D
	EPA 8260C
Methyl methacrylate	EPA 8260D
	EPA 8260C
Chlorinated Hydrocarbons	
1,2,3-Trichlorobenzene	EPA 8260D
	EPA 8260C
Fuel Oxygenates	
Di-isopropyl ether	EPA 8260D
	EPA 8260C
Ethanol	EPA 8260D
	EPA 8260C
Methyl tert-butyl ether	EPA 8260D
	EPA 8260C
tert-amyl alcohol	EPA 8260D
	EPA 8260C
tert-amyl methyl ether (TAME)	EPA 8260D
	EPA 8260C
tert-butyl alcohol	EPA 8260D
	EPA 8260C

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WADSWORTH CENTER

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MR. JON WALSH
YORK ANALYTICAL LABORATORIES, INC. (II)
132-02 89TH AVENUE SUITE 217
RICHMOND HILL, NY 11418

NY Lab Id No: 12058

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved analytes are listed below:

Fuel Oxygenates

tert-butyl ethyl ether (ETBE)	EPA 8260D
	EPA 8260C

Volatile Aromatics

1,2,4-Trichlorobenzene, Volatile	EPA 8260D
	EPA 8260C
1,2,4-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,2-Dichlorobenzene	EPA 8260D
	EPA 8260C
1,3,5-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,3-Dichlorobenzene	EPA 8260D
	EPA 8260C
1,4-Dichlorobenzene	EPA 8260D
	EPA 8260C
2-Chlorotoluene	EPA 8260D
	EPA 8260C
4-Chlorotoluene	EPA 8260D
	EPA 8260C
Benzene	EPA 8260D
	EPA 8260C
Bromobenzene	EPA 8260D

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All approved analytes are listed below:

Volatile Aromatics

Bromobenzene	EPA 8260C
Chlorobenzene	EPA 8260D
	EPA 8260C
Ethyl benzene	EPA 8260D
	EPA 8260C
Isopropylbenzene	EPA 8260D
	EPA 8260C
m/p-Xylenes	EPA 8260D
	EPA 8260C
Naphthalene, Volatile	EPA 8260D
	EPA 8260C
n-Butylbenzene	EPA 8260D
	EPA 8260C
n-Propylbenzene	EPA 8260D
	EPA 8260C
o-Xylene	EPA 8260D
	EPA 8260C
p-Isopropyltoluene (P-Cymene)	EPA 8260D
	EPA 8260C
sec-Butylbenzene	EPA 8260D
	EPA 8260C
Styrene	EPA 8260D
	EPA 8260C

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Volatile Aromatics

tert-Butylbenzene	EPA 8260D
	EPA 8260C
Toluene	EPA 8260D
	EPA 8260C
Total Xylenes	EPA 8260D
	EPA 8260C

Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 8260D
	EPA 8260C
1,1,1-Trichloroethane	EPA 8260D
	EPA 8260C
1,1,2,2-Tetrachloroethane	EPA 8260D
	EPA 8260C
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA 8260D
	EPA 8260C
1,1,2-Trichloroethane	EPA 8260D
	EPA 8260C
1,1-Dichloroethane	EPA 8260D
	EPA 8260C
1,1-Dichloroethene	EPA 8260D
	EPA 8260C
1,1-Dichloropropene	EPA 8260D

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Volatile Halocarbons

1,1-Dichloropropene	EPA 8260C
1,2,3-Trichloropropane	EPA 8260D
	EPA 8260C
1,2-Dibromo-3-chloropropane	EPA 8260D
	EPA 8260C
1,2-Dibromoethane	EPA 8260D
	EPA 8260C
1,2-Dichloroethane	EPA 8260D
	EPA 8260C
1,2-Dichloropropane	EPA 8260D
	EPA 8260C
1,3-Dichloropropane	EPA 8260D
	EPA 8260C
2,2-Dichloropropane	EPA 8260D
	EPA 8260C
2-Chloroethylvinyl ether	EPA 8260D
	EPA 8260C
Bromochloromethane	EPA 8260D
	EPA 8260C
Bromodichloromethane	EPA 8260D
	EPA 8260C
Bromoform	EPA 8260D
	EPA 8260C

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Volatile Halocarbons

Bromomethane	EPA 8260D
	EPA 8260C
Carbon tetrachloride	EPA 8260D
	EPA 8260C
Chloroethane	EPA 8260D
	EPA 8260C
Chloroform	EPA 8260D
	EPA 8260C
Chloromethane	EPA 8260D
	EPA 8260C
cis-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
cis-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
Dibromochloromethane	EPA 8260D
	EPA 8260C
Dibromomethane	EPA 8260D
	EPA 8260C
Dichlorodifluoromethane	EPA 8260D
	EPA 8260C
Hexachlorobutadiene, Volatile	EPA 8260D
	EPA 8260C
Methylene chloride	EPA 8260D

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Volatile Halocarbons

Methylene chloride	EPA 8260C
Tetrachloroethene	EPA 8260D
	EPA 8260C
trans-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
trans-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
trans-1,4-Dichloro-2-butene	EPA 8260D
	EPA 8260C
Trichloroethene	EPA 8260D
	EPA 8260C
Trichlorofluoromethane	EPA 8260D
	EPA 8260C
Vinyl chloride	EPA 8260D
	EPA 8260C

Volatiles Organics

1,4-Dioxane	EPA 8260D
	EPA 8260C
2-Butanone (Methylethyl ketone)	EPA 8260D
	EPA 8260C
2-Hexanone	EPA 8260D
	EPA 8260C

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All approved analytes are listed below:

Volatiles Organics

4-Methyl-2-Pentanone	EPA 8260D
	EPA 8260C
Carbon Disulfide	EPA 8260D
	EPA 8260C
Cyclohexane	EPA 8260D
	EPA 8260C
Methyl acetate	EPA 8260D
	EPA 8260C
Methyl cyclohexane	EPA 8260D
	EPA 8260C
Vinyl acetate	EPA 8260D
	EPA 8260C

Sample Preparation Methods

	EPA 5030C

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Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

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All approved analytes are listed below:

Perfluorinated Alkyl Acids

Perfluorooctanesulfonic Acid (PFOS)	EPA 537
	EPA 537.1
Perfluorooctanoic Acid (PFOA)	EPA 537
	EPA 537.1

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All approved analytes are listed below:

Acrylates	
Acrolein (Propenal)	EPA 8260D
	EPA 8260C
Acrylonitrile	EPA 8260D
	EPA 8260C
Methyl methacrylate	EPA 8260D
	EPA 8260C
Chlorinated Hydrocarbons	
1,2,3-Trichlorobenzene	EPA 8260D
	EPA 8260C
Volatile Aromatics	
1,2,4-Trichlorobenzene, Volatile	EPA 8260D
	EPA 8260C
1,2,4-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,2-Dichlorobenzene	EPA 8260D
	EPA 8260C
1,3,5-Trimethylbenzene	EPA 8260D
	EPA 8260C
1,3-Dichlorobenzene	EPA 8260D
	EPA 8260C
1,4-Dichlorobenzene	EPA 8260D
	EPA 8260C

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All approved analytes are listed below:

Volatile Aromatics

2-Chlorotoluene	EPA 8260D
	EPA 8260C
4-Chlorotoluene	EPA 8260D
	EPA 8260C
Benzene	EPA 8260D
	EPA 8260C
Bromobenzene	EPA 8260D
	EPA 8260C
Chlorobenzene	EPA 8260D
	EPA 8260C
Ethyl benzene	EPA 8260D
	EPA 8260C
Isopropylbenzene	EPA 8260D
	EPA 8260C
m/p-Xylenes	EPA 8260D
	EPA 8260C
Naphthalene, Volatile	EPA 8260D
	EPA 8260C
n-Butylbenzene	EPA 8260D
	EPA 8260C
n-Propylbenzene	EPA 8260D
	EPA 8260C
o-Xylene	EPA 8260D

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Volatile Aromatics

o-Xylene	EPA 8260C
p-Isopropyltoluene (P-Cymene)	EPA 8260D
	EPA 8260C
sec-Butylbenzene	EPA 8260D
	EPA 8260C
Styrene	EPA 8260D
	EPA 8260C
tert-Butylbenzene	EPA 8260D
	EPA 8260C
Toluene	EPA 8260D
	EPA 8260C
Total Xylenes	EPA 8260D
	EPA 8260C

Volatile Halocarbons

1,1,1,2-Tetrachloroethane	EPA 8260D
	EPA 8260C
1,1,1-Trichloroethane	EPA 8260D
	EPA 8260C
1,1,2,2-Tetrachloroethane	EPA 8260D
	EPA 8260C
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA 8260D
	EPA 8260C

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Volatile Halocarbons

1,1,2-Trichloroethane	EPA 8260D
	EPA 8260C
1,1-Dichloroethane	EPA 8260D
	EPA 8260C
1,1-Dichloroethene	EPA 8260D
	EPA 8260C
1,1-Dichloropropene	EPA 8260D
	EPA 8260C
1,2,3-Trichloropropane	EPA 8260D
	EPA 8260C
1,2-Dibromo-3-chloropropane	EPA 8260D
	EPA 8260C
1,2-Dibromoethane	EPA 8260D
	EPA 8260C
1,2-Dichloroethane	EPA 8260D
	EPA 8260C
1,2-Dichloropropane	EPA 8260D
	EPA 8260C
1,3-Dichloropropane	EPA 8260D
	EPA 8260C
2,2-Dichloropropane	EPA 8260D
	EPA 8260C
2-Chloroethylvinyl ether	EPA 8260D

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All approved analytes are listed below:

Volatile Halocarbons

2-Chloroethylvinyl ether	EPA 8260C
Bromochloromethane	EPA 8260D
	EPA 8260C
Bromodichloromethane	EPA 8260D
	EPA 8260C
Bromoform	EPA 8260D
	EPA 8260C
Bromomethane	EPA 8260D
	EPA 8260C
Carbon tetrachloride	EPA 8260D
	EPA 8260C
Chloroethane	EPA 8260D
	EPA 8260C
Chloroform	EPA 8260D
	EPA 8260C
Chloromethane	EPA 8260D
	EPA 8260C
cis-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
cis-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
Dibromochloromethane	EPA 8260D
	EPA 8260C

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Volatile Halocarbons

Dibromomethane	EPA 8260D
	EPA 8260C
Dichlorodifluoromethane	EPA 8260D
	EPA 8260C
Hexachlorobutadiene, Volatile	EPA 8260D
	EPA 8260C
Methylene chloride	EPA 8260D
	EPA 8260C
Tetrachloroethene	EPA 8260D
	EPA 8260C
trans-1,2-Dichloroethene	EPA 8260D
	EPA 8260C
trans-1,3-Dichloropropene	EPA 8260D
	EPA 8260C
Trichloroethene	EPA 8260D
	EPA 8260C
Trichlorofluoromethane	EPA 8260D
	EPA 8260C
Vinyl chloride	EPA 8260D
	EPA 8260C

Volatile Organics

1,4-Dioxane	EPA 8260D

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Volatile Organics

1,4-Dioxane	EPA 8260C
2-Butanone (Methylethyl ketone)	EPA 8260D
	EPA 8260C
2-Hexanone	EPA 8260D
	EPA 8260C
4-Methyl-2-Pentanone	EPA 8260D
	EPA 8260C
Acetone	EPA 8260D
	EPA 8260C
Carbon Disulfide	EPA 8260D
	EPA 8260C
Cyclohexane	EPA 8260D
	EPA 8260C
Methyl acetate	EPA 8260D
	EPA 8260C
Methyl cyclohexane	EPA 8260D
	EPA 8260C
Methyl tert-butyl ether	EPA 8260D
	EPA 8260C
tert-butyl alcohol	EPA 8260D
	EPA 8260C
Vinyl acetate	EPA 8260D
	EPA 8260C

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All approved analytes are listed below:

Sample Preparation Methods

EPA 5035A-L
EPA 5035A-H

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APPENDIX F

Project Personnel Resumes

RONALD D. BOYER, PE

PRINCIPAL/VICE PRESIDENT

GEOTECHNICAL ENGINEERING

Mr. Boyer is an experienced geotechnical engineer whose practice involves coordination and supervision of subsurface investigations; establishment and monitoring of geotechnical instrumentation; design of shallow and deep foundation systems; evaluation of earth slope stability; design and inspection of subgrade improvement applications; preparation of geotechnical engineering reports and construction specifications; performance of pre-construction conditions documentation; coordination and supervision of construction inspection services; and monitoring of adjacent structures during demolition and construction.

SELECTED PROJECTS

- 11 Hubert Street, New York, NY
- 110 University Place, New York, NY
- 111 Murray Street Development, New York, NY
- 120 Neptune Avenue, Brooklyn, NY
- 125 Greenwich Street Development, New York, NY
- 150 Amsterdam Avenue, New York, NY
- 22 Thames Street, New York, NY
- 225 East 39th Street Development, New York, NY
- 2329 Nostrand Avenue, Brooklyn, NY
- 259 West 10th Street, New York, NY
- 315 East 46th Street, New York, NY
- 414 West 15thh Street, New York, NY
- 485 Fifth Avenue, New York, NY
- 510 West 22nd Street, New York, NY
- 57 Reade Street Development, New York, NY
- 92 Fulton Street, New York, NY
- American Dream Meadowlands, East Rutherford, NJ
- Avalon Bay, Boonton, NJ
- Bank Street Commons, White Plains, NY
- Brooklyn Law School Dormitory, Brooklyn, NY
- Cape Liberty Cruise Port, Bayonne, NJ
- CarMax - Waterbury, CT
- Christian Cultural Center, Brooklyn, NY
- Christiana Phase 2 Retail Development, Christiana, DE
- Circuit City Store, Wayne, NJ
- Clifton Commons, Clifton, NJ
- Colgate-Palmolive Waterfront Development, Various Locations
- Daily News Printing Press Facility, Jersey City, NJ
- DDC Rikers Island, New York, NY
- Essex Street Roadway Improvements, Hackensack, NJ
- Fifth Avenue Presbyterian Church, New York, NY
- General Motors - Lighthouse Landing, Sleepy Hollow, NY
- Giants Training Facility, East Rutherford, NJ
- Golden Orchards Geotechnical Support, Washington Township, NJ

EDUCATION

M.S., Civil Engineering (Geotechnical) Virginia Tech

B.S., Civil Engineering Virginia Tech

PROFESSIONAL REGISTRATION

Professional Engineer (PE) in NJ, NY

AFFILIATIONS

Deep Foundations Institute (DFI)

American Institute of Architects

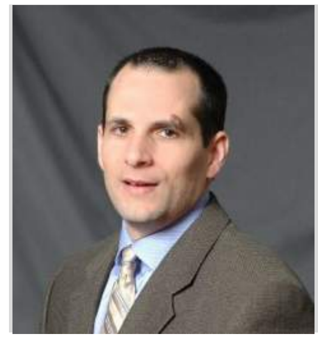
Associated General Contractors of NJ

- Greenwich School, Greenwich, NJ
- Hudson County Courthouse, Jersey City, NJ
- K. Hovnanian at Bedminster Stormwater Detention System, Bedminster, NJ
- Kinko's, Norwalk, CT
- Kohl's Distribution Center, Mamakating, NY
- Lehman Brothers Data Center, Cranford, NJ
- Lehman Brothers Data Center, Piscataway, NJ
- Lowe's Norwalk, CT
- MetLife Stadium, East Rutherford, NJ
- Metropolitan Executive Towers, East Rutherford, NJ
- Morgan Stanley Data Center, Somerset, NJ
- Morristown Airport Hanger, Morristown, NJ
- MOMA West, New York, NY
- Newark International Airport, CONRac, Newark, NJ
- Newark International Airport, AirTrain Replacement, Newark, NJ
- New Britain Retail Center, New Britain, CT
- Northwest Airlines Cargo Facility, JFK International Airport, Queens, NY
- Norwalk Retail Development, Norwalk, CT
- One Bridge Plaza, Fort Lee, NJ
- PRBC - Medical Office Building, East Stroudsburg, PA
- Prospect Plaza, Brooklyn, NY
- PSEG Overhead Transmission, Throughout NJ
- River Bend at Port Imperial, West New York, NJ
- River Street Redevelopment, Hackensack, NJ
- Riverfront Stadium Redevelopment, Newark, NJ
- Riverside Square Mall Expansion, Hackensack, NJ
- Roosevelt Island DEP Seawall, New York, NY
- Roosevelt Island Park, Esplanade and Seawall, New York, NY
- Route 209 Expansion, Mamakating, NY
- Route 3 Flyover Bridge, Meadowlands, East Rutherford, NJ
- St Barnabas Hospital, Livingston, NJ
- Stevens Institute of Technology, Student Housing and University Center, Hoboken, NJ
- Stop & Shop, Various Locations
- T172 & S171N Transmission Lines, North Smithfield, RI
- Target Development, Bethel, CT
- Target Store, Horn Lake, MS
- Temporary Office Trailer Complex, East Rutherford, NJ
- The Standard, New York, NY
- The Venetian, Brooklyn, NY
- Westlakes Office Complex, Berwyn, PA
- Yonkers Avenue Bridge, Westchester County, NY

ANTHONY MOFFA, JR., ASP, CHMM, COSS, CSP

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 nearly 20 years of 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. His 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)

Certified Safety Professional (CSP)

AFFILIATIONS

Pennsylvania Chamber of Business & Industry

Chemical Council of New Jersey

New Jersey Business & Industry Association

Geoprofessional Business Association

American Society of Safety Professionals

AMANDA FORSBURG, CHMM

SENIOR PROJECT SCIENTIST

BROWNFIELD REDEVELOPMENT, DUE DILIGENCE AND SITE INVESTIGATION, REMEDIAL ACTIONS

Ms. Forsburg has 14 years of experience primarily focused on providing environmental support to redevelopment sites within the metropolitan New York area. She has experience with projects in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) and Spill Programs, New York City Office of Environmental Remediation (NYCOER) E-Designated and New York City Voluntary Cleanup Program (VCP) sites, and New York City Department of Environmental Protection (NYCDEP) remediation sites. Her field experience includes implementation and management of all phases of environmental projects involving soil, groundwater, and soil vapor contamination including Phase I inspections, Phase II site investigations, Remedial Investigations, and Remedial Actions.

During her tenure at Langan, Ms. Forsburg's experience has included schematic-, design-, and construction-phase project team involvement on numerous large scale construction projects requiring multi-disciplinary coordination and collaboration across different Langan teams and offices.

SELECTED PROJECTS

- 101 Murray Street, New York, NY (NYSDEC Spill Site, Multi-discipline)
- 110 University Place, New York, NY (NYSDEC Spill Site, Multi-discipline)
- 138 Willoughby Street, Brooklyn, NY (NYCOER E-Designation Site, Multi-discipline)
- 180 East 125th Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 1905 Surf Avenue, Brooklyn, NY (NYCOER E-Designation Site, Multi-discipline)
- 1921 Atlantic Avenue, Brooklyn, NY (NYSDEC BCP Site)
- 225 East 39th Street, New York, NY (NYCDEP Remediation Site, Multi-Discipline)
- 23-30 Borden Avenue, Queens, NY (NYSDEC BCP Site, Multi-discipline)
- 28-90 Review Avenue, Queens, NY (NYSDEC BCP Site, Multi-discipline)
- 280 West 155th Street, New York, NY (NYSDEC BCP Site, Multi-discipline)
- 311 West 42nd Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 363 and 365 Bond Street, Brooklyn, NY (NYSDEC BCP Site, Multi-discipline)
- 400 Park Avenue South, New York, NY (NYCOER E-Designation and VCP Site)
- 412 Greenwich Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)

EDUCATION

B.A., Environmental Studies
Bucknell University

B.A., Environmental Geology
Bucknell University

PROFESSIONAL REGISTRATION

Certified Hazardous Materials Manager (CHMM)

OSHA 29 CFR 1910.120 Certification (HAZWOPER)

AFFILIATIONS

New Jersey Society of Women Environmental Professionals (NJSWEP) - MetroNet Committee

Association of Environmental and Engineering Geologists

Professional Women in Construction

Urban Land Institute, Norther New Jersey Chapter - Women's Leadership Initiative Co-Chair

- 42-50 24th Street, Queens, NY (NYSDEC Spill Site, Multi-discipline)
- 460 West 41st Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 505 West 19th Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 508 West 24th Street, New York, NY (NYCOER E-Designation and VCP Site, Multi-discipline)
- 525 West 52nd Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 53 West 53rd Street (MoMA Expansion), New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 54 Crown Street, Brooklyn, NY (NYCOER E-Designation and VCP Site, Multi-discipline)
- 540 West 26th Street, New York, NY (NYSDEC Spill Site, Multi-discipline)
- 550 Tenth Avenue, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- 68 Charlton Street, New York, NY (NYCOER E-Designation Site, Multi-discipline)
- Broome Street Parking Lot Site, New York, NY (NYSDEC BCP Site, Multi-discipline)
- Marble Collegiate Church Office Building, New York, NY (Multi-discipline)
- Norfolk Street Site, New York, NY (NYCOER E-Designation Site, Multi-discipline)

Steven Ciambruschini, PG, LEP

Principal/Vice President

Environmental Site Assessments/Investigations, Brownfield Remediation, UST Management

33 years in the industry ~ 28 years with Langan

Mr. Ciambruschini has over 30 years of experience in hydrogeologic and environmental investigations including management of environmental and geotechnical investigations relating to petroleum and chlorinated solvent spill sites, underground storage tank sites, manufactured gas plant sites, landfills, wastewater treatment facilities and industrial/commercial sites. His experience includes managing environmental compliance audits, remedial investigation, pre-acquisition due diligence and permitting assessment, feasibility studies and design, construction and operation of complex innovative remediation systems to treat, contain and recover contaminated soil and groundwater. These projects are managed under various NJDEP, PADEP, NYDEC, NYCDEP and CTDEP programs. Mr. Ciambruschini provides consultation to a diverse group of clients including private developers, utilities, retail and industrial facilities and is expert in assessing remediation options and funding options under various state and federal grant, loan and tax reimbursement programs including Brownfield programs.

Selected Projects

- Brodson Property, Montville NJ, (RCRA, NJDEP ACO Cleanup)
- Carroll Gardens, Brooklyn, NY (NY Brownfield, EPA Superfund, OER E-designated Site)
- Con Edison Appendix B Spill Sites - Various Locations, NY
- Former MGP Site, Brooklyn, NY (VCP Site)
- Extell Development, Hudson Yards, New York, NY (NYC E-designated, NYS Brownfield Site)
- Pan Graphics, Bergen County, NJ (ISRA, LSRP)
- New Jersey Turnpike General Environmental Services Contract, Various Sites, NJ
- Liberty Science Center, Jersey City, NJ (EO 215)
- Blue Back Square, West Hartford, CT (UST, Transfer Act, Brownfield)
- Hershey, Act II Investigation (PA VCP)
- Hershey, Naugatuck, CT (CT Transfer Act)
- Halby Chemical Sites, Various Sites, DE (CERCLA)
- Unisys, Middletown CT, (CT Transfer Act, Brownfield)
- Ryder Rental, Various Sites in CT (CT Transfer Act)
- St. Marks Avenue, Brooklyn, NY (Vapor Mitigation)
- Pan Graphics, Lodi, NJ (Eco Risk Assessment, LSRP)

Education

M.S., Geology
Montclair State University

M.A., Environmental Science
Montclair University

B.S., Environmental Science
Cook College, Rutgers University

Professional Registration

Professional Geologist (PG) in NY, DE, KY

Licensed Environmental Professional (LEP) in CT

Underground Storage Tank License in NJ

Affiliations

National Ground Water Association

Association of Ground Water Scientists and Engineers

American Association of Petroleum Geologists

Environmental Professionals of Connecticut

American Bar Association (ABA)

LANGAN

LAUREN KOTT, PE

SENIOR STAFF ENGINEER

ENVIRONMENTAL ENGINEERING, REMEDIAL INVESTIGATION

Ms. Kott has 9 years of experience working on environmental projects, particularly investigation and remediation of environmental contamination. She has participated in multiple phases of site remediation including site investigation, remedial investigation, and remedial action. Her experience includes sample collection and characterization of various environmental media, and preparing reports and other environmental regulatory documents.

SELECTED PROJECTS

- Passaic Gifted and Talented Academy School No 20, Passaic, NJ*
- Former GM Plant and Redevelopment, Ewing, NJ*
- The Chelsea at Greenburgh, White Plains, NY*
- Brightview Devon, Wayne, PA*
- Residential Property, New Paltz, NY*
- Former Industrial Property, Bayonne, NJ*
- Childcare Facility, Jersey City, NJ*
- Allied Concrete, Rockaway, NJ*
- Mountain Creek, Vernon, NJ*
- Frankford Firehouse, Branchville, NJ*
- Venue at Longview, Plumsted Township, NJ*
- Venue at Smithville Greene, Eastampton, NJ*
- The Collection at Morristown, Morris Plains, NJ*
- Gables at Woodcliff Lake, Woodcliff Lake, NJ*
- Mountain Ridge Development, Mt. Olive, NJ*
- Brightview Port Jefferson, Port Jefferson, NY*
- Brightview Paramus, Paramus, NJ*
- Proposed Senior Living Facility, Rockville Centre, NY*

EDUCATION

B.E., Environmental Engineering
University of Delaware

PROFESSIONAL REGISTRATION

Professional Engineer (PE) in NJ

10-Hour Construction Safety

40-Hour HAZWOPER

** Denotes experience with previous firm*

MARLENA JEWETT

DATA ANALYST

CAD/GIS

1 year in the industry

Proposed Title: Field Technician

Ms. Jewett is a data analyst with experience in database design, management and visualization using EarthSoft's EQuIS™ database in support of environmental site characterizations for sites regulated under federal and state compliance programs. Her expertise includes integration of analytical databases and coordination with GIS users.

In her current role Marlena assists project teams with planning and implementation of project databases and data visualization. This includes coordinating with field staff and laboratories to define, workflows, SOPs and ensure the receipt of the proper deliverables for field and lab data; reviewing and managing project data and information using EQuIS™, Microsoft® Access, and Excel; generating data reports including tables, graphs, charts, and GIS compatible files; and generating and reviewing electronic data deliverables following project or agency specific formats.

Education

B.A., Environmental Economics
Colgate University

Work History

Equitable Advisors
Financial Advisor
9/7/2020-4/23/2021

Langan
Data Analyst
5/10/2021 – Present

SELECTED PROJECTS

EQuIS Management and NYSDEC deliverables – Data Analyst. Loaded and maintained soil, groundwater, and soil vapor data in an EQuIS database for a remedial investigation and waste characterizations of New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), NYC Office of Environmental Remediation (OER), and due diligence sites. Provided final report deliverables including sample summaries; tags; and exceedance summary exports from EQuIS. Completed this work for the following projects:

- **2-8 Main Street**
- **28-90 Review Avenue**
- **34-15 10th Street**
- **37-11 30th Street**
- **44-01 Northern Boulevard**
- **45 Commercial Avenue**
- **50 Jersey Avenue**
- **111 Willow Street**
- **118 West 13th Street**
- **122 Fifth Avenue**
- **155 Third Street**
- **160 East 125th Street**
- **210 Clarkson Avenue**
- **241 West 28th Street**
- **266 West 96th Street**
- **445 Gerard Avenue**
- **475 Bay Street and 31 Wave Street**

- **495 Peninsula Boulevard**
- **561 Greenwich Street**
- **563 Sackett Street**
- **805-825 Atlantic Avenue**
- **1525 Bedford Avenue**
- **2455 Third Avenue**
- **4650 Broadway**
- **ABC Block 27**
- **Bay Crane**
- **Broome Street**
- **Former Grant Hardware**
- **Forsyth and Delancy Street**
- **Gowanus Canal Northside**
- **Greenpoint Landing E1**
- **Greenpoint Landing Parcel H3**
- **John Evans**
- **Kissena Boulevard**
- **NYCHA Farragut**
- **Remeeder**

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.

APPENDIX G

Citizen Participation Plan

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
12096 Flatlands Avenue

September 2019

C224290
12096 Flatlands Avenue
Brooklyn
Kings County, NY 11236

Contents

* * * * *

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

Applicant: **Innovative Urban Living, LLC**
Site Name: **12096 Flatlands Avenue**
Site Address: **12096 Flatlands Avenue, Brooklyn, NY**
Site County: **Kings County**
Site Number: **C224290**

1. What is New York's Brownfield Cleanup Program?

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

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

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

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

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

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

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

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

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

Project Contacts

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

Locations of Reports and Information

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

Site Contact List

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

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

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

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

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

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

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

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

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, it has been determined that the site does not pose a significant threat.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

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

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.

Citizen Participation Activities	Timing of CP Activity(ies)
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process. Other issues of concern, could be related to truck traffic, odor or noise issues.

There will be areas on the Site where soil excavation is necessary. Therefore, once the remediation commences, there may be concerns regarding odors, noise or truck traffic coming from the Site. However, these impacts will be mitigated through implementation of a Health and Safety Plan (HASP) and Soil Management Plan approved by the Department, which will be designed to minimize these impacts. A Community Air Monitoring Plan (CAMP) will also be implemented to monitor dust and vapors to ensure the community is not impacted.

The Site is located in an Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

The site is located in an area with a large African-American population nearby. No need to translate into another language. For additional information, visit: https://statisticalatlas.com/tract/New-York/Kings-County/105804/Race-and-Ethnicity

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

- **location – 12096 Flatlands Avenue, Brooklyn, Kings County**
- **setting - urban, suburban or rural**
- **site size – 1.5716 Acres**
- **adjacent properties – residential, commercial**

History of Site Use, Investigation, and Cleanup

Historic landfilling operations occurred on the site, which reportedly included the use of waste and ash from a city incinerator in the early 1900s. In addition, a gasoline station and auto dismantling facility were present. Although no subsurface impacts were identified to date associated with the former gasoline station use, subsurface soil and groundwater impacts have been identified from the landfilling operations, including the present of semi-volatile organic compounds ("SVOCs") and heavy metals. This contamination was identified during the limited initial investigation performed to date, which included five test pits, six soil borings, and one groundwater monitoring well. Based on the historical use of the Site as a gasoline station, auto dismantling facility and incinerator ash waste disposal site, additional contamination is likely to be found during the upcoming remedial investigation that will performed shortly, and which is described below.

5. Investigation and Cleanup Process

Application

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

The Applicant in its Application proposes that the site will be used for restricted residential purposes.

To achieve this goal, the Applicant will conduct investigation activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and
4) Provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft "Remedial Investigation Work Plan" to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

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

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC

would then issue a “Certificate of Completion” (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”. The Remedial Work Plan describes the Applicant’s proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

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

Certificate of Completion

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

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

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

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

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

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

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

New York State Department of Environmental Conservation (NYSDEC):

Steven Wu
Project Manager
NYSDEC Region 2
Division of Environmental Remediation
47-40 21st Street
Long Island City, NY 11101-5401
Steven.wu@dec.ny.gov

New York State Department of Health (NYSDOH):

Steven Karpinski
Public Health Specialist
NYSDOH
Empire State Plaza
Room 1787
Albany, New York 12237
Steven.karpinski@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Spring Creek Library
Brooklyn, NY 11207
Attn: Benita McCray
Phone: 718-257-6571
Hours: Mon, Tues, Fri 10am-6pm
Wed 1pm-8pm
Thurs 10am-8pm
Sat 10am-5pm

Brooklyn Community Board No: 5
404 Pine Street, 3rd Floor
Brooklyn, NY 11208
Attn: Andre T. MitchellPhone: 929-221-8261
Hours: Call for appointment

Appendix B - Site Contact List

Hon. Charles Schumer U.S. Senator 780 Third Ave., Suite 2301 New York, NY 10017	Hon. Kirsten Gillibrand U.S. Senator 780 Third Ave., Suite 2601 New York, NY 10017
Hon. Hakeem Jeffries U.S. House of Representatives 55 Hanson Place, Suite 603 Brooklyn, NY 11217	Hon. Roxanne Persaud New York State Senate - 25th District 1222 East 96th Street Brooklyn, NY 11236
Hon. Jumaane Williams Public Advocate 1 Centre Street, 15th Floor New York, NY 10007	Hon Charles Barron NYS Assemblyman 669 Vermont Street Brooklyn, NY 11207
Hon. Inez Barron NYC Councilwoman 718 Pennsylvannia Avenue Brooklyn, NY 11207	Mark McIntyre, Director NYC Office of Environmental Remediation 100 Gold Street - 2nd Floor New York, NY 10038
Julie Stein Office of Environmental Assessment & Planning NYC Dept. of Environmental Protection 96-05 Horace Harding Expressway Flushing, NY 11373	Nancy T. Sunshine Kings County Clerk 360 Adams Street, Room 189 Brooklyn, NY 11201
Hon. Eric Adams Kings County Executive (Borough President) Borough Hall 209 Joralemon Street Brooklyn, NY 11201	Marisa Lago - Commissioner NYC Planning 120 Broadway, 31st FloorNew York, NY 10271
Vincent Sapienza New York City Public Water Supply System Department Commissioner 59-17 Junction Blvd. Flushing, NY 11373	Bill de Blasio Mayor of New York City City Hall New York, NY 10007
Andrea Hagelgans	Eric L. Adams

Strategic Planning Advisor, New York City City Hall New York, NY 10007	Brooklyn Borough President Brooklyn Borough Hall, 209 Jorakemon Street Brooklyn, NY 11201
David Kirschner Brooklyn Media Outlet - News 12 Woodbury, NY 11791	Park Slope Courier Media Outlet 1 Metrotech Center North Brooklyn, NY 11201
Christian Cultural Center, Inc. Adjacent Property Owner of 12120 Flatlands Avenue 12020 Flatlands Avenue Brooklyn, NY 11207	Nationwide Money Services, Inc. Adjacent Property Operator of 12120 Flatlands Avenue 12120 Flatlands Avenue Brooklyn, NY 11207
Christian Cultural Center, Inc. Adjacent Property Owner of 152-50 Flatlands Avenue 12020 Flatlands Avenue Brooklyn, NY 11207	Council Towers III Housing Development Fund Corporation Adjacent Property Owner of 1180 Pennsylvania Avenue c/o Metropolitan New York Coordinating Counsel on Jewish Property 9 Murray New York, NY 10007
Council Towers III Housing Development Fund Corporation Adjacent Property Owner of 1170 Pennsylvania Avenue c/o Metropolitan New York Coordinating Counsel on Jewish Property 9 Murray New York, NY 10007	Jewish Community Council Adjacent Property Operator of 1170 Pennsylvania Avenue 1170 Pennsylvania Avenue #1B Brooklyn, NY 11239
Starrett City, Inc. Adjacent Property Owner of 1155 Pennsylvania Avenue 150 East 58th Street, 23rd FL New York, NY 10155	Who's Next Barbershop Adjacent Property Operator of 1155 Pennsylvania Avenue 1155 Pennsylvania Avenue Brooklyn, NY 11239
Spring Creek Recreational Fund Adjacent Property Owner of Pennsylvania Avenue 150 East 58th Street, 23rd FL New York , NY 10155	1121 Pennsylvania Avenue Adjacent Property Owner of 1121 Pennsylvania Avenue 1144 Atlantic Avenue Baldwin, NY 11510
CONOCO Adjacent Property Operator of 1121 Pennsylvania Avenue 1121 Pennsylvania Avenue Brooklyn, NY 11207	12049 Flatlands Ave. Corp. Adjacent Property Owner of 12049 Flatlands Avenue 4854 E. Speedway Blvd. Tucson, AZ 85712

Ultimate Used Auto Parts Adjacent Property Operator of 12049 Flatlands Avenue 12049 Flatlands Avenue Brooklyn, NY 11207	Ultimate Used Auto Parts Adjacent Property Operator of 12049 Flatlands Avenue 12049 Flatlands Avenue Brooklyn, NY 11207
Peter Bill Stathakos Adjacent Property Owner of 12079 Flatlands Avenue 36 94th Street Brooklyn, NY 11209	Self-help Community Guardian Program Adjacent Property Owner of 1036 Sheffield Avenue 520 8th Avenue, 5th Floor New York, NY 10018
Spartan Petroleum Corp. Adjacent Property Owner of 12099 Flatlands Avenue 3333 New Hyde Park Rd., Suite 201 New Hyde Park, NY 11042	Spartan Petroleum Corp. Adjacent Property Owner of 12113 Flatlands Avenue 3333 New Hyde Park Rd., Suite 201 New Hyde Park, NY 11042

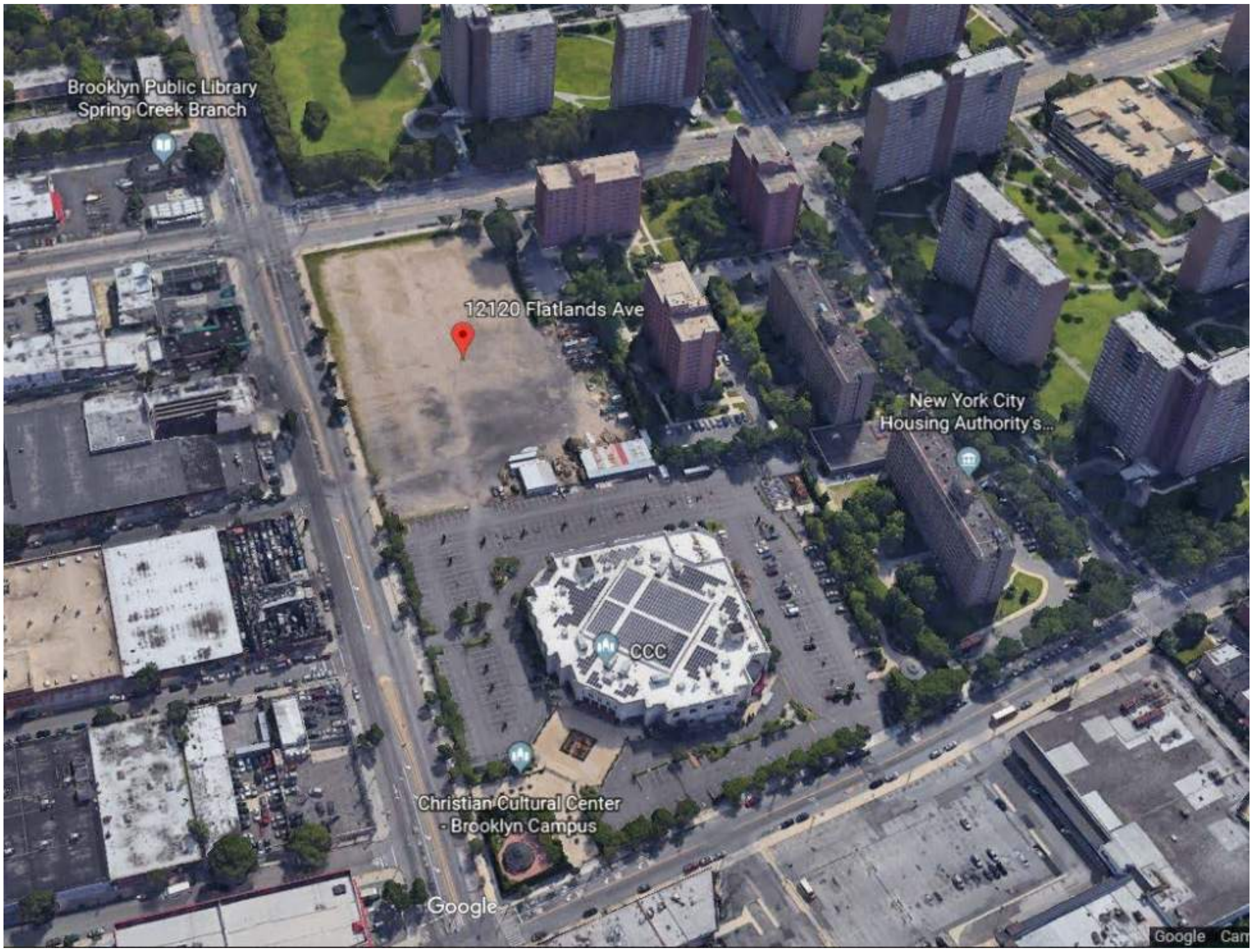
Local Schools and Daycare Centers	
P.S. 306 Ethan Allen School Attn: Principal 970 Vermont Street Brooklyn, NY 11207	P.S. 260 Breuckelen Attn: Principal 875 Williams Avenue Brooklyn, NY 11207

Community, Civic, Religious and Other Environmental Organizations:	
Vandalia Senior Center 47 Vandalia Avenue Brooklyn, NY 11239	Vandalia Houses – NYCHA Management Development Office 17 Vandalia Avenue Brooklyn, NY 11239
Vandalia Houses – NYCHA President – Resident Association 17 Vandalia Avenue Brooklyn, NY 11239 Breukelen Day Care Center 717 East 105th Street Brooklyn, NY 11236	Breukelen Community Center 715 E 105th St Brooklyn, NY 11236

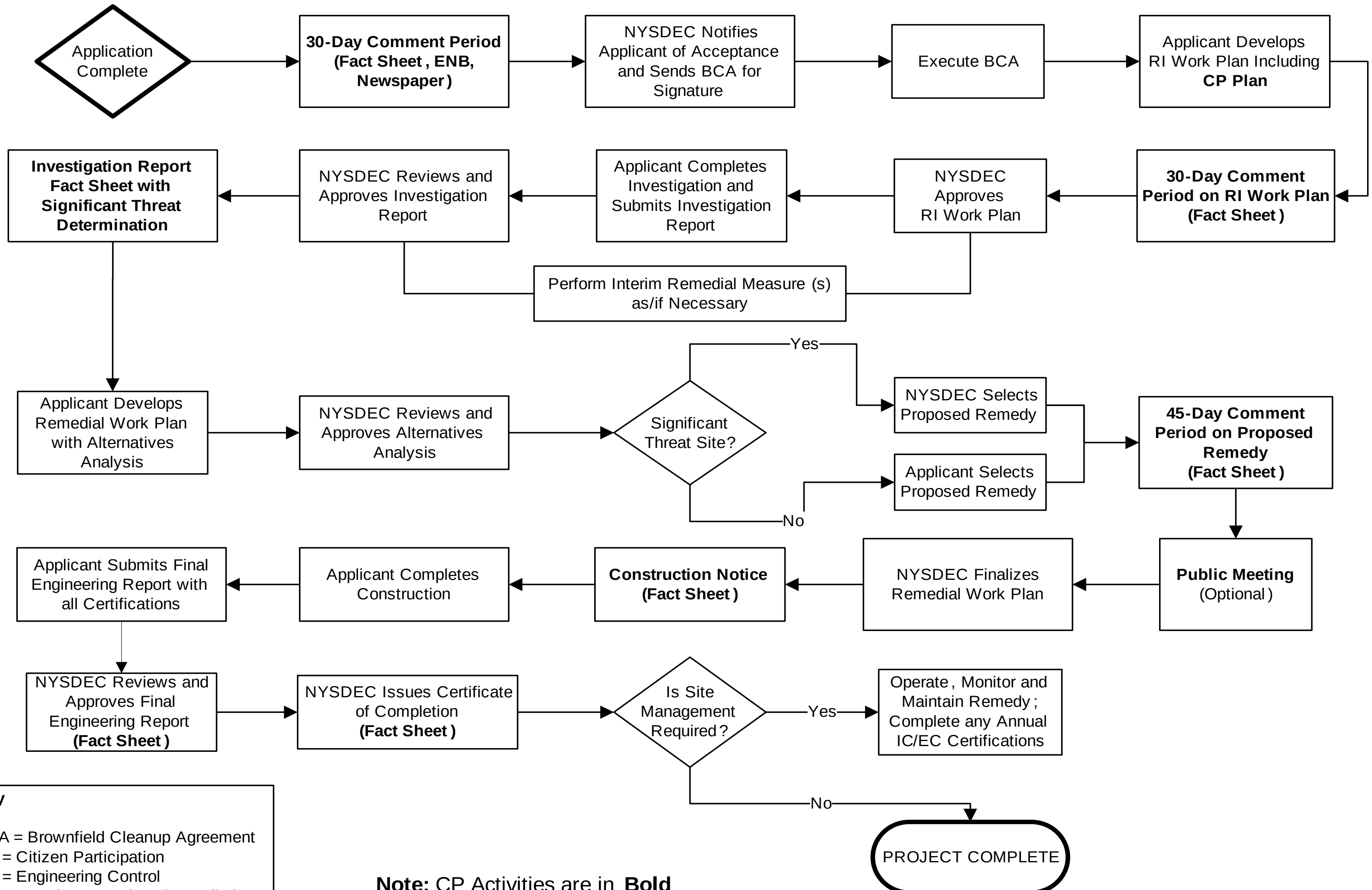
Breukelen Houses – NYCHA Management Development Office 618 East 108th Street Brooklyn, NY 11236	Breukelen Houses – NYCHA President – Resident Association 618 East 108th Street Brooklyn, NY 11236
Wortman Community Center 895 Pennsylvania Avenue Brooklyn, NY 11207	Wortman – NYCHA Management Development Office 895 Pennsylvania Avenue Brooklyn, NY 11207
Wortman – NYCHA President – Resident Association 895 Pennsylvania Avenue Brooklyn, NY 11207	St Laurence Church 12265 Flatlands Ave Brooklyn, NY 11207
Italian American Civil Rights League 1460 Pennsylvania Ave #1B Brooklyn, NY 11239	

Local Media Outlets	
Spectrum NY 1 News 75 Ninth Avenue New York, NY 10011	Courier-Life Publications 1 Metrotech Center #10T Brooklyn, NY 11201
Brooklyn Daily Eagle 16 Court Street, Suite 1208 Brooklyn, NY 11241	The Brooklyn Papers 1 Metrotech Center, Suite 1001 Brooklyn, NY 11201
New York Daily News 4 New York Plaza New York, NY 10004	New York Post 1211 Avenue of the Americas New York, NY 10036

Appendix C - Site Location Map



Appendix D– Brownfield Cleanup Program Process



Note: CP Activities are in **Bold**

Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern

Site Name: 12096 Flatlands Avenue

Site Number: C224290

Site Address and County: 12096 Flatlands Avenue, Brooklyn, NY Kings County

Remedial Party(ies): Innovative Urban Living, LLC

Note: For Parts 1. – 3. the individuals, groups, organizations, businesses and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and information needs. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**

How were these issues and/or information needs identified?

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.

How were these information needs identified? The volunteer has been in negotiations with the site owner, which operates a very active community church facility adjacent to this brownfield site. This parcel was essentially an excess former parking lot for the church. Community participation will likely continue through the reverend for this church and his parishioners.

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.

As stated in the attached CPP, once remediation is commenced, there will likely be a need to inform the community of the remediation activities.

How were these issues and/or information needs identified? See response to Part 2 above in relation to the local community church leader.

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning at and around site:
☒ **Residential** ☐ **Agricultural** ☒ **Recreational** ☒ **Commercial** ☐ **Industrial**

b. Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

c. Population density around site:
☒ **High** ☒ **Medium** ☐ **Low**

d. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

e. Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:

f. Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:

g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☒ **Yes** ☐ **No**

h. Special considerations:
Language ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h: large African-American population**

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in Part 2. of the Citizen Participation Plan under 'Site Contact List'. Are *other* individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☐ **Non-Adjacent Residents/Property Owners:**

☒ **Local Officials:**

☒ **Media:**

☒ **Business/Commercial Interests:**

☐ **Labor Group(s)/Employees:**

☐ **Indian Nation:**

☒ **Citizens/Community Group(s):**

☐ **Environmental Justice Group(s):**

☐ **Environmental Group(s):**

☐ **Civic Group(s):**

☒ **Recreational Group(s):**

☐ **Other(s):**

Prepared/Updated By: Linda Shaw, Esq. **Date: June 8, 2019**

Reviewed/Approved By: Thomas V. Panzone **Date:** 7/1/19

APPENDIX H

Remediation Schedule

Appendix H
Remedial Action Work Plan
Remedial Action Construction Schedule
12096 Flatlands Avenue
Brooklyn, New York

Estimated Project Schedule

Item	Action	2023												2024											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	Implementation of RAWP with Engineering Oversight																								
2	Preparation of an Environmental Easement, FER, and SMP																								
3	NYSDEC & NYSDOH Review of FER (and SMP)																								
4	NYSDEC Issues COC																								

Notes:

a) This is an estimated schedule; all items are subject to change.
b) Completion of Item 1 refers to the completion of remediation and not the end of overall construction.
c) NYSDEC = New York State Department of Environmental Conservation
d) NYSDOH = New York State Department of Health
e) RAWP = Remedial Action Work Plan
f) FER = Final Engineering Report
g) SMP = Site Management Plan
h) COC = Certificate of Completion