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REMEDIAL INVESTIGATION WORK PLAN

Project Address: 261 Grand Concourse
Bronx, New York 10451

Vektor Project No: 21030009

Report Date: September 7, 2021

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CERTIFICATION

I, Ezgi Karayel, certify that I am currently a Qualified Environmental Professional as defined in 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 and that this Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).



09/07/2021

Ezgi Karayel
Principal

1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) was prepared on behalf of 261 Grand Concourse LLC (the Requestor) for the property located at 261 Grand Concourse in the Mott Haven section of Bronx County, New York (the Site). The Requestor intends to enroll into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a Volunteer. A BCP Application is being submitted concurrently with this RIWP.

The purpose of this RIWP is to investigate the Site in order to characterize the nature and extent of contamination associated with historic operations at the Site. The overall objectives of this project are to remediate and prepare the Site for its proposed residential use. This RIWP was prepared in accordance with the regulations and guidance applicable to the BCP, and DER-10 Technical Guidance for Site Investigation and Remediation dated May 2010, and the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York, with revisions (October 2006).

2.0 SITE BACKGROUND

2.1 Site Location and Description

The Site is located on the west side of Grand Concourse and east side of Walton Avenue between East 138th Street to the south and East 140th Street to the north within the Mott Haven section of Bronx County, New York. The Site consists of one tax lot that is approximately 10,242-square feet (0.235 acres). The legal description of the subject property is Block 2344 and Lot 1. A site location map is provided as Figure 1.

The ownership of the subject property is vested in 261 Grand Concourse LLC since 2020.

The Site is currently developed with a two-story slab on grade building. The two-story building is currently vacant and consists of office space in the southern section of the first floor, warehouse space in the northern portion of the first floor, and former offices on the second floor. The entire site is covered by the concrete building slab with no exposed soil.

The Site is located within a primarily mixed residential, commercial, and industrial area of Bronx County. The Site is zoned as C6-2A, denoting it as a Contextual General Central Commercial Zoning District. C6-2A districts allow for a variety of commercial use buildings, community facilities, and residential buildings and generally consist of large buildings with retail, office, or residential use. Contextual Zoning Districts are required to comply with the Quality Housing Program guidelines when used for residential use.

2.2 Surrounding Property Land Use

North	A one-story commercial use building (270 Walton Avenue)
South	A public park across 138th Street (East 138th Street and Major Deegan Expressway)
West	A gasoline station (109 East 138th Street) and a six-story industrial/manufacturing property (261 Walton Avenue)
East	Under construction for a multi-story residential use building (276 Grand Concourse) and a two-story commercial building (250 Grand Concourse)

The property adjacent to the north of the subject property along Walton Avenue and Grand Concourse consists of a one-story commercial warehouse building; the properties adjacent to the east across Grand Concourse are a construction site for a multi-story residential building and a two-story commercial building; the property adjacent to the south across East 138th Street is Deegan Rock, an NYC public park; and the properties adjacent to the west

across Walton Avenue consist of a gasoline station and a six-story industrial/manufacturing building. The underground tracks for the Metropolitan Transportation Authority (MTA) "4" and "5" lines run below Grand Concourse to the east of the Site. A Site plan showing surrounding land use is provided as Figure 2.

The nearest ecological receptor is the Harlem River located approximately 0.1-miles west of the Site. Other sensitive receptors, as defined in DER-10, within 1,000-feet of the Site include:

- Family Life Academy Charter School III at 370 Gerard Avenue
- Community School for Social Justice at 350 Gerard Avenue
- Health Opportunities High School at 350 Gerard Avenue
- Narco Freedom-Grand Concourse Health Care Facility at 250 Grand Concourse
- Success Academy Charter School at 339 Morris Avenue

2.3 Site Topography, Geology, and Hydrogeology

According to the United States Geological Survey (USGS) Topographic Quadrangle for "*Central Park, New York"* dated 2013, the subject property is located at approximately 18-feet above mean sea level (MSL). The contour lines in the subject property area indicate the area is sloping gently toward the southwest.

According to a limited soil investigation conducted at the subject property in 2019, solid bedrock is present beneath the subject property at depths ranging from 3 feet to 5 feet below grade surface (bgs).

Groundwater flow direction may be impacted by several factors, including surface topography, hydrology, hydrogeology, characteristics of soil, and nearby wells. According to topographic map interpretation, the inferred groundwater flow direction in the vicinity of the subject property is south-southwest towards the Harlem River, located approximately 600-feet to the west of the subject property.

According to a previous investigation conducted on the west adjacent property across Walton Avenue (at 115 East 138th Street) in 2001, the depth of groundwater in the vicinity of the subject property is inferred to be approximately 8 to 15 feet below ground surface (bgs) and flows toward the southwest.

2.4 Site History

Based on the available sources, the subject property was undeveloped as early as 1891; and developed in the southern portion with a two-story commercial building utilized as offices by 1908. The subject property was developed as part of two separate tax lots at the time. The two-story structure was demolished circa 1935, and the southern portion of the subject property was utilized as part of a gasoline station, which occupied the main tax lot. The

subject property was developed into the current tax parcel configuration sometime between 1935 and 1941 as two adjacent tax lots; and redeveloped with a one-story concrete and brick building utilized as a plastic products manufacturing facility in the northern portion in 1947. The use of the subject property building was changed to a warehouse circa 1977. The southern portion of the subject property was utilized as parking between 1996 and 1998; and redeveloped as a one-story commercial building between 1998 and 2001. The two one-story buildings appear to be interconnected by 2004. According to the New York City Department of Building (NYCDOB) records, the building appears to be vertically enlarged to two-story circa 2008.

Tenants on the subject property included a gasoline station in 1935; private residents since at least 1940; Electric Vacuum Co in 1940; plastic products manufacturer between 1947 and at least 1951; Copyrite Plastic Sheets between 1961 and 1965; Teitelbaum & Sons Incorporated between 1961 and 1983; Olympic Sheet Metal, Incorporated between 1993 and 1994; AA Kold Air, Incorporated between 1993 and 2005; MSV Enterprises between 1994 and 2004; Bronx Air Conditioning Center in 1994; GPJ O'Donoghue Contracting Corporation between 2014 and 2017; ESB Electric, Incorporated between 2014 and 2017; and Cayuga Home for Children in 2017.

2.5 Redevelopment Plans

Foundation and redevelopment plans are still in the early stages. However, the proposed redevelopment includes demolition of the existing two-story building and construction of a new 12-story residential building. The entire footprint of the Site is located in an En-Zone (part of the Bronx Census Tract 63), and entry into the BCP would facilitate the remediation and redevelopment into a new residential project. The new building is planned to include affordable housing units.

2.6 Summary of Previous Investigations

Two previous investigations performed at the Site include the following:

Limited Subsurface Investigation by Gallinger Environmental Management Corp., dated December 19, 2019

- Gallinger Environmental Management Corp. (GEM) prepared this report on behalf of NOBR 261 LLC.
- At the time of the GEM investigation, the subject property consisted of the current two-story commercial building with a parking garage, tool storage area, carpenter shop, loading dock, lobby, and offices.

- GEM's limited investigation consisted of a limited geophysical survey, installation of fourteen soil borings, and collection of six soil samples.
- GEM identified a possible underground storage tank (UST) fill pipe in the parking garage. The geophysical scan revealed a strong signal extending approximately six feet off the pipe, indicative of a UST.
- Select soil samples were analyzed for CP-51 list volatile organic compounds (VOCs) via USEPA Method 8260C and semi-volatile organic compounds (SVOCs) via USEPA Method 8270D.
- Shallow bedrock was encountered across the subject property at depths ranging between 3 and 5 feet bgs. Groundwater was not encountered during the investigation.
- Fill material consisting of sand, brick, concrete, and asphalt was encountered from 1-foot bgs to the bedrock surface.
- No VOCs were detected in the soil samples.
- SVOCs, consisting of polycyclic hydrocarbons (PAHs), were detected in all six soil samples. Of these, benzo(a)anthracene (max. of 8.2 mg/kg), benzo(a)pyrene (max. of 6.9 mg/kg), benzo(b)fluoranthene (max. of 6.4 mg/kg), benzo(k)fluoranthene (max. of 5.7 mg/kg), chrysene (max. of 7.4 mg/kg), dibenzo(a,h)anthracene (max. of 2.1 mg/kg) and indeno(1,2,3-cd)pyrene (max. of 3.9 mg/kg) were detected at concentrations exceeding their respective NYSDEC Part 375 Restricted Residential Use Soil Cleanup Objectives (SCOs) in three of the soil samples.

Based on the limited soil investigation, the primary contaminants of concern are SVOCs. Soil samples obtained during the 2019 investigation were compared to 6 NYCRR Part 375 Unrestricted Use SCOs and Restricted Residential Use SCOs based on the anticipated residential use of the Site.

Phase I Environmental Site Assessment by Vektor Consultants, dated July 9, 2021

- Vektor conducted a Phase I Environmental Site Assessment (ESA) on behalf of the Requestor in accordance with ASTM E1527-13.
- At the time of the site reconnaissance on July 1, 2021, the Site consisted of one irregular-shaped lot that is approximately 10,242-square feet in area and was developed with a two-story slab on grade building. The two-story building was vacant and consisted of an office space in the southern section of the first floor, warehouse space in the northern portion of the first floor, and former offices on the second floor.

The Phase I ESA has revealed the following recognized environmental conditions (RECs) in connection with the subject property:

- Based on the available review of available Fire Insurance Maps and City Directory listings, the subject property was utilized as part of a gasoline station in 1935, as a plastic products manufacturing facility from 1947 until at least 1951, and as various commercial and industrial uses at least until 2017.
- Presence of SVOCs at concentrations exceeding their respective Unrestricted Use SCOs and Restricted Residential Use SCOs in soil beneath the Site that were identified during the 2019 GEM limited investigation.

This Phase I ESA revealed the following environmental issues in connection with the subject property:

- Listing on the New York E-Designation database (E-227) for hazardous materials, noise, and air quality as a result of rezoning of the general surrounding area (Lower Concourse Rezoning and Related Actions (CEQR # 08DCP071X)).
- Adjacent properties of environmental concern were identified as follows: the west adjacent properties across Walton Avenue were used as a piano factory and lumber storage facility (1908-1935), auto wrecking yard (1944-1951), cleansers manufacturer (1947), a service center (1956), and a gasoline station (1951-Present); the east adjacent property across Grand Concourse was used as a gasoline station (1935), and auto repair facilities (1944-2017); and the south adjacent property across East 138th Street was used as gasoline stations and auto repairs (1935).

Copies of these previous reports are provided as Appendix A.

3.0 REMEDIAL INVESTIGATION

A Remedial Investigation (RI) proposed herein will supplement the prior assessments to characterize the nature and extent of contamination at the Site. The supplemental data will be analyzed to characterize the nature and extent of contamination at the Site and to evaluate remedial action alternatives.

The remedial investigation will consist of the following scope of work:

- Geophysical survey to locate unidentified underground storage tanks (USTs) and identify utilities in the vicinity of the proposed boring locations,
- Installation of six soil borings to refusal/bedrock (assumed at a maximum of 5 feet bgs) across the Site and collection of twelve soil samples and additional quality assurance /quality control (QA/QC) samples,
- Installation of three monitoring wells and collection of three groundwater samples and additional QA/QC samples,
- Installation of five soil vapor points and collection of five soil vapor samples and one ambient air sample as a QA/QC.

Table 1 provides a summary of the sampling protocol and rationale.

If modifications to the scope of work are required due to site conditions, the NYSDEC and NYSDOH project managers will be notified. All deviations will be reported in the Remedial Investigation Report (RIR).

3.1 Geophysical Survey

A Ground Penetrating Radar (GPR) Survey will be conducted by a licensed geophysical surveyor to determine the locations of any potential USTs at the Site and to clear out the boring locations prior to drilling. A grid of north-south traverses will be established across the Site at five-foot intervals. The data will be processed on-site and used to create a contour map.

3.2 Soil Investigation

Total of six soil borings (SB-1 trough SB-6) will be installed to investigate potential impacts from the former uses of the Site. A direct push drill-rig operated by a licensed driller subcontractor will be utilized for the installation of soil borings at the Site. The soil borings will be advanced continuously to refusal/bedrock, or to groundwater, whichever is encountered first (the “boring termination depth”). Based on the prior limited soil investigation conducted at the Site, bedrock is expected at a maximum depth of 5 feet bgs. Soil samples will be retrieved using 1.5-inch diameters, 5-foot-long core sampler with disposable acetate liners. A Geologist will be on Site to log the soils, visually characterize

them, and field screen them with a photo ionization detector (PID) for the presence of petroleum contamination.

From each boring location, a minimum of two soil samples (total of 12 samples) will be collected for laboratory analysis. At these borings, one soil sample will be collected from the shallow soils (i.e.: historic fill layer) at 0 to 2 feet bgs interval and one soil sample will be collected from above the groundwater interface, if encountered. If groundwater is not encountered, the sample will be collected from the interval immediately above refusal/bedrock. An additional sample will be collected from any interval exhibiting evidence of contamination (i.e., staining, odors, elevated PID readings).

Representative soil samples will immediately be containerized in pre-cleaned laboratory supplied glassware, stored in a chilled cooler (4°C), and submitted to a New York State Department of Health certified laboratory.

The soil samples will be analyzed for:

- Target Compound List (TCL) volatile organic compounds (VOCs) via Environmental Protection Agency (EPA) Method 8260C/5035
- TCL semi-volatile organic compounds (SVOCs) via EPA Method 8270D
- Total analyte list (TAL) metals via EPA Method 6010D/7471B
- Polychlorinated biphenyls (PCBs) via EPA Method 8082A
- TLC pesticides via EPA Method 8081B
- NYSDEC list per and polyfluoroalkyl substances (PFAS) via EPA Method 537.1
- 1,4-dioxane via EPA Method 8270 SIM.

Table 1 provides a sampling matrix, and Figure 3 shows the proposed soil boring locations.

3.3 Groundwater Investigation

Three of the proposed soil borings (SB-1, SB-2, and SB-3) will be converted into permanent groundwater monitoring wells upon completion of soil sampling. MW-1 through MW-3 will be installed to determine the groundwater flow direction and to evaluate the groundwater quality beneath the Site.

The proposed monitoring wells will be constructed of 2-inch diameter PVC casing and 0.010-inch slotted PVC well screen. The 10 feet screen will be set 5 feet below the groundwater table. Morrie No. 1 or equivalent clean sand will be used to fill the annular gap around the screen and above the top of the screened interval. A bentonite seal will be installed above the sand and the remainder of the borehole will be backfilled to grade with non-petroleum impacted drill cuttings and/or clean sand. The monitoring wells will be flush-mounted metal manhole covers set in concrete.

Monitoring wells will then be developed by surging a pump, bailer, or surge block inside the wells. The method will be repeated until sediment free water is produced, or water turbidity is 50 nephelometric turbidity units (NTU) or less.

All monitoring wells will be surveyed by a New York State licensed surveyor in order to determine the actual direction of groundwater beneath the Site.

Approximately one week after well development, one groundwater sample will be collected from each of the monitoring wells (total of three groundwater samples). Prior to sampling, each monitoring well will be gauged and purged until groundwater quality parameters such as temperature, dissolved oxygen, oxidation-reduction potential, pH and turbidity stabilize. Samples will then be collected using a peristaltic pump and dedicated tubing in accordance with low-flow sampling procedures. The pump will be decontaminated with Alconox® and water between each monitoring well.

Groundwater samples will be containerized in pre-cleaned laboratory-supplied glassware, stored in a chilled cooler (4°C), and submitted to a New York State Department of Health certified laboratory.

The groundwater samples will be analyzed for:

- Target Compound List (TCL) volatile organic compounds (VOCs) via Environmental Protection Agency (EPA) Method 8260C
- TCL semi-volatile organic compounds (SVOCs) via EPA Method 8270D
- Total analyte list (TAL) metals (filtered and unfiltered) via EPA Method 6010D/7470
- Polychlorinated biphenyls (PCBs) via EPA Method 8082A
- TLC pesticides via EPA Method 8081B
- NYSDEC list per and polyfluoroalkyl substances (PFAS) via EPA Method 537.1
- 1,4-dioxane via EPA Method 8270D SIM.

Table 1 provides a sampling matrix, and Figure 3 shows the proposed monitoring well locations.

3.4 Soil Vapor Investigation

Five soil vapor points (SV-1 through SV-5) will be installed using the same direct-push drill rig mentioned above. Soil vapor points will be installed and sampled in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). Soil vapor points will be installed approximately 2 feet above the groundwater. If groundwater is no encountered, soil vapor points will be installed immediately above the

bedrock. Sample points will be constructed of a dedicated stainless-steel screen fitted with ¼-inch outer diameter inert polyethylene, teflon lined, tubing which will be extended above ground surface to allow for purging and sampling. The points will be backfilled using glass beads followed by environmental grade silica sand and topped with a bentonite layer to seal the tubing in the hole.

Prior to testing, a tracer gas will be used in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) technique to verify the integrity of the soil vapor point seal. The integrity of vapor points will be tested by placing a plastic shroud over the vapor points to isolate them from ambient air. Then, a helium tracer gas will be applied into the shroud and will be screened utilizing a helium detector for presence of helium. If no helium is detected in any of the vapor points, then sampling will occur. If helium is detected, then the points will be resealed properly prior to sampling.

After purging approximately three volumes of air from each vapor point at a flow rate less than 200 milliliters per minute, representative samples will be collected for laboratory analysis utilizing 6-liter SUMMA canisters fitted with 2-hour flow controllers set not to exceed 0.2 liters per minute, as established by the NYSDOH Guidance document. Upon completion of the vapor sampling, all canisters will be labeled properly with the sample ID numbers, and vacuum pressure readings in the canisters before and after the sample collection. The vapor samples will then be submitted to a NYSDOH ELAP-certified laboratory under proper chain of custody procedures to be analyzed for VOCs by EPA Method TO-15.

One ambient air sample will be collected at a breathing height as a background sample. The outdoor air sample will be collected over a 2-hour sampling period concurrently with the soil vapor samples and analyzed for VOCs via EPA Method TO-15.

Table 1 provides a sampling matrix, and Figure 3 shows the proposed monitoring well locations.

3.5 Management of Investigation Derived Waste

As per the DER-10, soil cuttings and other soil generated on-site during remedial investigation will be returned to the borehole, unless:

- Free product, NAPL, or grossly contaminated soil, are present in the cuttings,
- The boreholes will be used for installation of a monitoring well,
- The borehole has an aquitard, or other confining later,
- Backfilling the borehole with cuttings will create a significant path for vertical movement of contaminant
- Soil cannot fit into the borehole

Those soil cuttings needing to be managed on-site will be containerized in properly labeled Department of Transportation (DOT) approved 55-gallon drums for future off-site disposal at a permitted facility. All boreholes which require soil cuttings disposal would ultimately be filled with hydrated bentonite chips and asphalt/concrete capping.

Groundwater purged from the monitoring wells during development and sampling will be placed into DOT approved 55-gallon drums for future off-site disposal.

4.0 STANDARDS, CRITERIA, AND GUIDANCE (SCGS)

Based on the prior investigation findings, the primary chemical of concern at the Site is SVOCs.

The results of the soil samples will be compared to 6 NYCRR Part 375 Unrestricted Use SCOs and Restricted Residential Use SCOs based on the anticipated residential use of the Site.

The results of the groundwater samples will be compared to the NYSDEC Class GA Ambient Water Quality Standards (AWQS), or Guidance Values (GVs) as specified in the Technical Operation and Guidance Series (TOGS 1.1.1) Ambient Water Quality Standards and Guidance Values.

Soil vapor results will be evaluated to determine the type and concentration of VOCs present and to determine if engineering controls are required to prevent future exposure of these chemicals to future occupants of the new building.

5.0 QUALITY CONTROL/QUALITY ASSURANCE (QA/QC)

The QA/QC samples for soil and groundwater will include one matrix spike/matrix spike duplicate (MS/MSD), and one blind duplicate sample at a frequency of at least one sample per 20 field samples per media. One trip blank per cooler and one field blank per day per matrix collected will also be included. The field blank, blind duplicate, and MS/MSD samples will be analyzed for:

- TCL VOCs EPA Method 8260C/5035
- TCL SVOCs via EPA Method 8270D
- TAL metals via EPA Method 6010D/7471B
- PCBs via EPA Method 8082A
- TLC pesticides via EPA Method 8081B
- NYSDEC list PFAS via EPA Method 537.1
- 1,4-dioxane via EPA Method 8270 SIM.

Laboratory prepared trip blanks will be submitted for analysis of VOCs via EPA Method 8260.

Table 1 provides a sampling matrix with estimated QA/QC samples. A Quality Assurance Project Plan that describes how QA/QC procedures will be implemented during the RI is provided as Appendix B.

5.1 Data Submittal

Analytical results will be provided by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory. Data will be supplied in Analytical Services Protocol (ASP) Category B Data Packages, and all results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format (EQuIS).

5.2 Data Validation

Data validation will be performed in accordance with the EPA validation guidelines for organic and inorganic data review. A Data Usability Summary Report (DUSR) will be prepared by a third-party contractor upon receipt of the analytical laboratory reports. The DUSR will present the results of the 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 of each analytical method.

6.0 HEALTH AND SAFETY PLAN (HASP)

A site-specific Health and Safety Plan (HASP) is prepared for this project. All field personnel involved in investigation activities will participate in training required under 29 CFR 1910.120, such as 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records. The Site Safety Coordinator will be Matthew Brown. An emergency contact sheet is included in the site-specific HASP.

All investigative work performed under this RIWP will comply with all applicable health and safety laws and regulations, including OSHA worker safety requirements and HAZWOPER requirements. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Sub-contractors may choose to utilize their own site-specific HASP or adopt this HASP.

A copy of the site-specific Health and Safety Plan is provided as Appendix C.

7.0 COMMUNITY AIR MONITORING PLAN (CAMP)

Community air monitoring will be performed during this RI as required by the DER-10 (Appendix 1A, NYSDOH, Generic CAMP). Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels will be performed during intrusive activities such as soil boring and monitoring well installation. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities.

A detailed Community Air Monitoring Plan is provided as Appendix D.

8.0 REMEDIAL INVESTIGATION REPORT (RIR)

Upon receipt of the analytical results, Vektor will prepare a Remedial Investigation Report (RIR) in accordance with DER-10. The RIR will include the following sections:

- Introduction,
- Summary of site history,
- Summary of previous environmental investigation,
- Field methods and observations,
- Laboratory results section,
- Conclusions, and recommendations, where necessary.

The report will also include scaled sampling plans showing all sample locations and exceedances, field logs, soil borings logs, monitoring well construction logs, summary tables with comparison to respective standards, laboratory results, and a Qualitative Human Health Exposure Assessment in accordance with DER-10 (Appendix 3B) as appendices. All results will be provided in accordance with the NYSDEC EIMS EDD format (EQuIS).

9.0 SCHEDULE

The RI will be implemented upon approval of this RIWP by the NYSDEC and completion of the 30-day public comment period. The table below shows the anticipated schedule for completing the RI:

Task	Estimated Date (weeks from NYSDEC RIWP approval)	Duration (weeks)
Mobilization & RI Field Work	2	2
Laboratory Analysis	4	2
Laboratory Deliverables	6	2
Data Validation	8	3
Remedial Investigation Report	11	2-3

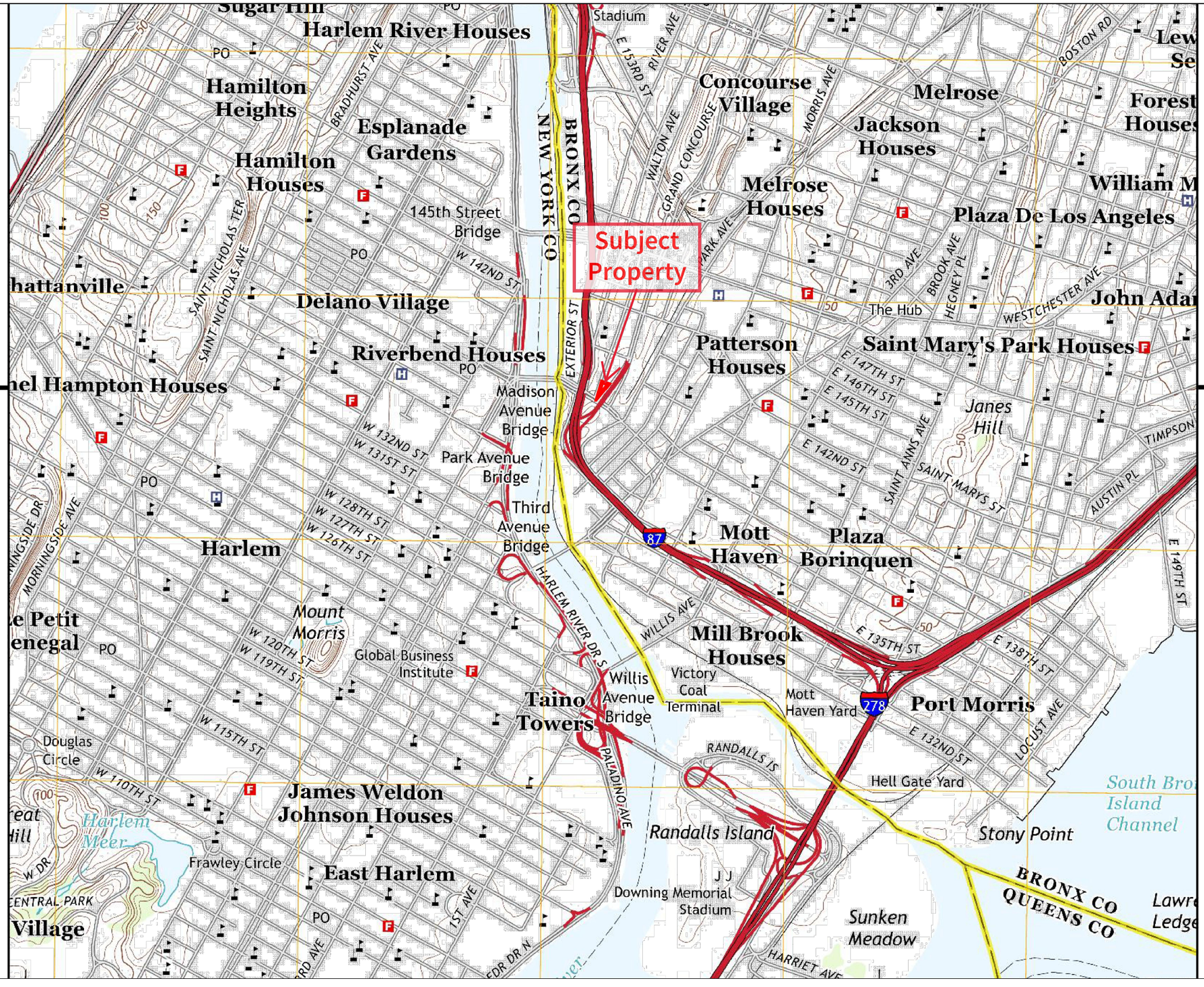
TABLES

Table 1
Sampling Rationale and Summary
261 Grand Concourse, Bronx, New York

Sample Matrix	Sample ID	Sample Interval (feet below surface grade)	Rationale	Estimated Number of Samples	Analysis
SOIL	SB-1 (Depth)	0'-2' (historic fill)	To assess the extent of historic fill and overall soil quality beneath the Site	1	Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), Pesticides, Total Analyte List (TAL) Metals, hexavalent chromium, trivalent chromium, per- and poly-fluoroalkyl substances (PFAS), and 1,4-dioxane
	SB-1 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-2 (Depth)	0'-2' (historic fill)		1	
	SB-2 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-3 (Depth)	0'-2' (historic fill)		1	
	SB-3 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-4 (Depth)	0'-2' (historic fill)		1	
	SB-4 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-5 (Depth)	0'-2' (historic fill)		1	
	SB-5 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-6 (Depth)	0'-2' (historic fill)		1	
	SB-6 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-DUP-1 (Depth)	Blind Duplicate: One per 20 soil samples	QA/QC	1	
	SB-MS/MSD (Depth)	One per 20 soil samples	QA/QC	1	
	FB-1	Field Blank	QA/QC	1	
	TB-1	Trip Blank: 1 per cooler per day (Lab-prepared)	QA/QC	1	TCL VOCs
			Total Quantity	16	
GROUNDWATER	MW-1	To be determined in the field based on groundwater depth	To assess groundwater quality beneath the Site	1	TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals (filtered and unfiltered), hexavalent chromium, trivalent chromium, PFAS, and 1,4-dioxane
	MW-2	To be determined in the field based on groundwater depth		1	
	MW-3	To be determined in the field based on groundwater depth		1	
	MW-DUP-1	Blind Duplicate: One per 20 groundwater samples	QA/QC	1	
	MW-MS/MSD	One per 20 groundwater samples	QA/QC	1	
	FB-2	Field Blank	QA/QC	1	
	TB-2	Trip Blank: 1 per cooler per day (Lab-prepared)	QA/QC	1	TCL VOCs
			Total Quantity	7	
SOIL VAPOR	SV-1	Immediately below proposed excavation depth or 2 feet above groundwater	To evaluate soil vapor conditions beneath the Site	1	VOCs (TO-15)
	SV-2	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	SV-3	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	SV-4	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	SV-5	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	AO-1	Field Blank	QA/QC	1	
			Total Quantity	6	

* Additional soil samples may be collected based on field conditions (i.e: elevated PID readings, odor, sheen, etc.)

FIGURES



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Legend:

Approximate Site Location

Base Map provided by Environmental Data Resources - United Geological Survey 7.5 Minute Series Central Park Quadrangle 2013

Scale:	
Figure No.	1
Figure Name:	Site Location Map
Report:	RIWP
Date:	09/07/21
Drawn By:	EK
Site Address:	261 Grand Concourse Bronx, New York



Legend:

Subject Property

Notes:

1. Drawing not to scale
2. All feature locations are approximate
3. Based Map provided by Google



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Legend:

	Site Boundary
SB-X/MW-X	Proposed Soil Boring and Monitoring Well Location and Designated ID
SB-X	Proposed Soil Boring Location and Designated ID
W-X	Prior Soil Boring Location (2019 GEM Inv.) and Designated ID
SV-X	Proposed Soil Vapor Point Location and Designated ID
OA-1	Potential Ambient Air Sample and Designated ID

Notes:

1. All feature locations are approximate

Scale: 0 50' 100'

Figure No.	3
Figure Name:	Proposed Sampling Plan
Report:	RIWP
Date:	09/07/2021
Drawn By:	EK
Site Address:	261 Grand Concourse Bronx, New York

APPENDICES

APPENDIX A

PREVIOUS ENVIRONMENTAL REPORTS

(See pdf Attachments)

APPENDIX B

QUALITY ASSURANCE PROJECT PLAN (QAPP)

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QUALITY ASSURANCE PROJECT PLAN

Prepared For: 261 Grand Concourse LLC

Project Name: Copyrite Plastic Sheets

Project Location: 261 Grand Concourse, Bronx, New York

Date: September 7, 2021

37 West 37th Street, 6th Floor, New York, NY 10018

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1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared on behalf of 261 Grand Concourse LLC (the Requestor) for the implementation of a remedial investigation (RI) by Vektor Consultants, LLC (Vektor) and its subcontractors at the property located at 261 Grand Concourse, Bronx, New York (the Site). The Site is identified by the City of New York as Borough of Bronx, Block 2344 and Lot 1.

The Requestor is in the process of applying as a Volunteer in the Brownfield Cleanup Program (BCP). The RI activities will be conducted in accordance with a New York State Department of Environmental Conservation (NYSDEC) approved Remedial Investigation Work Plan (RIWP).

This QAPP describes the protocols and procedures to be followed during the implementation of the NYSDEC approved RIWP. This QAPP was prepared in accordance with the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and the NYSDEC BCP Guide.

1.1 Scope of Work

A Remedial Investigation (RI) proposed herein will supplement the prior assessments to characterize the nature and extent of contamination at the Site. The supplemental data will be analyzed to characterize the nature and extent of contamination at the Site and to evaluate remedial action alternatives.

The proposed remedial investigation will consist of the following scope of work:

- Geophysical survey to locate unidentified underground storage tanks (USTs) and identify utilities in the vicinity of the proposed boring locations,
- Installation of six soil borings to refusal/bedrock (assumed at a maximum of 5 feet bgs) across the Site and collection of twelve soil samples and additional quality assurance /quality control (QA/QC) samples,
- Installation of three monitoring wells and collection of three groundwater samples and additional QA/QC samples,
- Installation of five soil vapor points and collection of five soil vapor samples and one ambient air sample as a QA/QC,
- Air monitoring during the RI, and
- Monitoring well survey.

A direct push drill-rig operated by a licensed driller subcontractor will be utilized for the installation of soil borings, monitoring wells, and soil vapor points at the Site.

2.0 PROJECT TEAM

Vektor's team of trained and experienced environmental scientists, geologists, and engineers along with Vektor's licensed subcontractors will perform the below-listed tasks in a manner consistent with DER-10 Technical Guidance for Site Investigation and Remediation (DER-10).

Project Director, QEP	Ezgi Karayel	Vektor Consultants
Project Manager	John Driscoll	Vektor Consultants
Field Leader	Matthew Brown	Vektor Consultants
Laboratory QA/QC Officer	Benjamin	York Analytical Laboratories, Inc.
Third-party Data Validator	Don Anne	Alpha Geoscience

2.1 Project Director

Ezgi Karayel, Qualified Environmental Professional, will act as the Project Director and Quality Assurance/Quality Control (QA/QC) officer and will ensure the successful completion of the remedial investigation. She will have the direct responsibility of preparation and certification of the Remedial Investigation Repot (RIR).

2.2 Project Manager

John Driscoll of Vektor will act as the Project Manager. He will oversee the field activities and coordinate for all elements of the RIWP. He will be responsible for coordinating with the field leader and other field crew as necessary.

2.3 Field Leader

Matthew Brown of Vektor will lead the field activities and ensure implementation of Health and Safety Plan (HASP) during all field work. He has the authority to stop all work if unsafe conditions are observed. He will be responsible for coordinating with all subcontractors. He will oversee the subcontractors in the field and collect samples outlined in the RIWP and in this QAPP.

2.4 Laboratory Quality Assurance/Quality Control Officer

Laboratory analysis will be completed by York Analytical Laboratories (York) of Stratford, CT. York is a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory (NY Cert. Numbers 10854 and 12058). Kriston Simmons is the Client Manager who will ensure that all glassware including

laboratory prepared trip blanks and chain of custodies are properly packaged and shipped. QA/QC Officer is Sarah Widomski who will ensure that quality assurance procedures are followed. Quality Assurance requirements for analytical laboratory data include accuracy, precision, sensitivity, representativeness, and completeness. Data will be supplied in Analytical Services Protocol (ASP) Category B Data Packages.

2.5 Third-Party Data Validator

Don Anne of Alpha Geoscience will be the third-party validator. Data validation will be performed in accordance with the EPA validation guidelines for organic and inorganic data review. A Data Usability Summary Report (DUSR) will be prepared by Don Anne upon receipt of the analytical laboratory reports. The DUSR will present the results of the 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 of each analytical method.

2.6 Other Subcontractors

- East Coast Geophysics, Inc. (ECG) of Bensalem, Pennsylvania, will conduct a geophysical survey.
- Coastal Environmental Solutions (Coastal) of Bohemia, New York will perform the soil boring, monitoring well, and soil vapor points installation.

3.0 SAMPLING METHODS PROCEDURES

This section describes the field protocol and procedures to be followed during the remedial investigation activities.

Table 1 provides a copy of the sampling summary. Figure 1 provides a copy of the proposed sampling plan.

3.1 Soil Sampling

Total of six soil borings will be installed to investigate potential impacts from the former uses of the Site. A direct push drill-rig operated by a licensed driller subcontractor will be utilized for the installation of soil borings at the Site. The soil borings will be advanced continuously to refusal/bedrock, or to groundwater, whichever is encountered first (the "boring termination depth"). Based on the prior limited soil investigation conducted at the Site, bedrock is expected at a maximum depth of 5 feet below grade surface (bgs). Soil samples will be retrieved using 1.5-inch diameters, 5-foot-long core sampler with disposable acetate liners.

- A Geologist will be on Site to log the soils, visually characterize them, and field screen them with a photo ionization detector (PID) equipped with 10.6 electron Volt (eV) lamp for the presence of petroleum contamination.
- All soil samples will be collected with disposable dedicated spoons to prevent cross contamination.
- All soil samples will immediately be placed in laboratory supplied glassware and labeled properly. Sample labels include Site address, sample identification and depth, date and time of sampling, analysis to be performed, and sampler's initials.
- Soil samples will be placed in coolers with ice to maintain a temperature of 4° C.
- A chain of custody that includes Site name and address, sample identification and depth, analysis to be performed, glassware summary, sampler's name and signature, turn-around-time and any additional notes will be prepared.
- All field observations including boring logs and PID readings will be recoded in a field book.
- Sampling equipment will be decontaminated between borings as further described in Section 3.0.
- All samples will be picked up from the Site on a daily basis by the laboratory's courier. The courier will sign the chain of custody upon pick up and provide a copy to Vektor.

The soil samples will be analyzed for:

- Target Compound List (TCL) volatile organic compounds (VOCs) via Environmental Protection Agency (EPA) Method 8260C/5035
- TCL semi-volatile organic compounds (SVOCs) via EPA Method 8270D

- Total analyte list (TAL) metals via EPA Method 6010D/7471B
- Polychlorinated biphenyls (PCBs) via EPA Method 8082A
- TLC pesticides via EPA Method 8081B
- NYSDEC list per and polyfluoroalkyl substances (PFAS) via EPA Method 537.1
- 1,4-dioxane via EPA Method 8270 SIM.

3.2 Groundwater Sampling

Three of the proposed soil borings will be converted into permanent groundwater monitoring wells upon completion of soil sampling. The proposed monitoring wells will be constructed of 2-inch diameter PVC casing and 0.010-inch slotted PVC well screen. The 10 feet screen will be set 5 feet below the groundwater table. Morrie No. 1 or equivalent clean sand will be used to fill the annular gap around the screen and above the top of the screened interval. A bentonite seal will be installed above the sand and the remainder of the borehole will be backfilled to grade with non-petroleum impacted drill cuttings and/or clean sand. The monitoring wells will be flush-mounted metal manhole covers set in concrete.

- Monitoring wells will then be developed by surging a pump, bailer, or surge block inside the wells. The method will be repeated until sediment free water is produced, or water turbidity is 50 nephelometric turbidity units (NTU) or less.
- Prior to sampling, each monitoring well will be gauged and purged using low-flow procedures.
- Depth to water will be measured by using an oil-water interface probe to the nearest 0.01 foot from the well casing.
- Low-flow parameters including temperature, pH, specific conductance, dissolved oxygen, and oxidation redox potential will be measured using Horiba U-52 Flow Cell or approved equal flow meter. The flow cell will be calibrated prior to field work.
- Groundwater samples will be collected after the field parameters have stabilized to within 10 percent of the previous reading.
- Groundwater samples will be collected using a peristaltic pump and dedicated tubing in accordance with low-flow sampling procedures. Tubing will be lowered to a mid-screen depth for purging and sampling.
- Groundwater samples will be containerized in pre-cleaned laboratory-supplied glassware, labeled, properly, and stored in a chilled cooler and maintain a temperature of 4°C. Sample labels include Site address, sample identification and depth, date and time of sampling, analysis to be performed, and sampler's initials.
- A chain of custody that includes Site name and address, sample identification and depth, analysis to be performed, glassware summary, sampler's name and signature, turn-around-time and any additional notes will be prepared.
- The pump will be decontaminated with Alconox® and water between each monitoring well.

- All field observations groundwater depth, thickness of product, if present, and low-flow sampling parameters will be recoded in a field book.
- Groundwater samples will not be collected from wells with floating product.
- All samples will be picked up from the Site on a daily basis by the laboratory's courier. The courier will sign the chain of custody upon pick up and provide a copy to Vektor.

The groundwater samples will be analyzed for:

- Target Compound List (TCL) volatile organic compounds (VOCs) via Environmental Protection Agency (EPA) Method 8260C
- TCL semi-volatile organic compounds (SVOCs) via EPA Method 8270D
- Total analyte list (TAL) metals (filtered and unfiltered) via EPA Method 6010D/7470
- Polychlorinated biphenyls (PCBs) via EPA Method 8082A
- TLC pesticides via EPA Method 8081B
- NYSDEC list per and polyfluoroalkyl substances (PFAS) via EPA Method 537.1
- 1,4-dioxane via EPA Method 8270D SIM.

3.3 Soil Vapor and Ambient Air Sampling

Five soil vapor points will be installed using the same direct-push drill rig mentioned above. Soil vapor points will be installed and sampled in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). Soil vapor points will be installed approximately 2 feet above the groundwater. If groundwater is no encountered, soil vapor points will be installed immediately above the bedrock. Sample points will be constructed of a dedicated stainless-steel screen fitted with ¼-inch outer diameter inert polyethylene, teflon lined, tubing which will be extended above ground surface to allow for purging and sampling. The points will be backfilled using glass beads followed by environmental grade silica sand and topped with a bentonite layer to seal the tubing in the hole.

- Prior to testing, a tracer gas will be used in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) technique to verify the integrity of the soil vapor point seal.
- The integrity of vapor points will be tested by placing a plastic shroud over the vapor points to isolate them from ambient air. Then, a helium tracer gas will be applied into the shroud and will be screened utilizing a helium detector for presence of helium. If no helium is detected in any of the vapor points, then sampling will occur. If helium is detected, then the points will be resealed properly prior to sampling.
- After purging approximately three volumes of air from each vapor point at a flow rate less than 200 milliliters per minute, representative samples will be collected for laboratory analysis utilizing 6-liter SUMMA canisters fitted with 2-hour flow

controllers set not to exceed 0.2 liters per minute, as established by the NYSDOH Guidance document.

- Upon completion of the vapor sampling, all canisters will be labeled properly with the sample ID numbers, and vacuum pressure readings in the canisters before and after the sample collection.
- The vapor samples will then be submitted to a NYSDOH ELAP-certified laboratory under proper chain of custody procedures to be analyzed for VOCs by EPA Method TO-15.
- One ambient air sample will be collected at a breathing height as a background sample. The outdoor air sample will be collected over a 2-hour sampling period concurrently with the soil vapor samples and analyzed for VOCs via EPA Method TO-15.
- All samples will be picked up from the Site on a daily basis by the laboratory's courier. The courier will sign the chain of custody upon pick up and provide a copy to Vektor.

3.4 PFAS Sampling Procedures

- PFAS samples will be collected first in order to prevent cross-contamination since sample containers for other methods may have PFAS present on the containers.
- Nitrile gloves will be using during sampling.
- No food or drink will be present during PFAS sampling.
- No waterproof field notebooks, plastic clipboards, sharpies, or adhesives will be used.
- PFAS samples will be kept in a separate cooler away from other sampling containers that may contain PFAS.
- Coolers will be filled with regular ice only.
- Only Alconox will be used for decontamination.
- Sampler will not wear clothing washed with fabric softener or containing Tyvek or PVC.
- Sampler will not use cosmetics, moisturizer, hand cream or other similar products on the day of the sampling.
- Sampler will not wear sunscreen or insect repellants.

Attachment 1 provides a copy of the NYSDEC Guidance document for sampling and analysis, and assessment of PFAS under NYSDEC's Part 375 Remedial Programs.

Attachment 2 provides a copy of York Analytical Laboratories' Standard Operating Procedure Summary for PFAS in Groundwater, Surface Water, and Soils.

Attachment 3 provides a copy of York Analytical Laboratories' PFOS/PFOA Certification and Reporting Limits for PFAS.

Attachment 4 provides a copy of blank chain of custody samples.

3.5 Quality Assurance (QA)/ Quality Control (QC) Sampling

The accuracy, precision and completeness of the samples will be addressed by the certified laboratory for all data generated. One blind duplicate sample and one matrix spike/matrix spike duplicate (MS/MSD) sample will be collected for every 20 samples media and submitted to the laboratory for analysis of the same parameters. One field blank per sampling media will be collected and analyzed for the same parameters as the respective media. It is assumed that all soil and soil vapor samples will be collected in one day, and all groundwater samples will be collected on another day. Trip blanks will be included in each cooler whenever samples are collected and transported to the laboratory for analysis of VOCs.

3.5.1 Trip Blanks

A trip blank consisting of two 40-ml vials filled with distilled, deionized water, will be provided by the laboratory. Trip blanks will be included in each cooler and will be analyzed for VOCs.

3.5.2 Field Blanks

Field blanks will be collected at a rate of one per 20 per soil and groundwater samples. Field blanks will be analyzed for the same analysis as the soil and groundwater samples collected on the day of the sampling.

3.5.3 PFAS Field Blank

A PFAS field blank will be prepared on each day that PFAS sampling occurs. Laboratory will provide PFAS blank bottles as well as pre-filled PFAS field blank water container. The contents of the PFAS field blank water container will be transferred into the PFAS field blank bottle. Both bottles will be returned to the laboratory along with the PFAS samples that were collected.

3.5.4 Blind Duplicate

A blind duplicate sample will be collected at a rate of one per 20 soil and groundwater samples. Blink duplicates will be analyzed for the same analysis as the soil and groundwater samples collected on the day of the sampling.

3.5.5 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD samples will be collected at a rate of oner per 20 soil and groundwater samples. MS/MSD samples will be analyzed for the same analysis as the soil and groundwater samples collected on the day of the sampling.

Table 2 provides laboratory analytical methods, glassware, and holding times for each analysis.

3.6 Field Instrumentation

The field instruments to be used during the remedial investigation will be calibrated at the beginning of each day as per the manufacturers' specifications. Calibration records will be recorded in the field book.

4.0 DECONTAMINATION

All sampling equipment will be decontaminated between sampling locations unless they are dedicated disposable tools. Decontamination of non-dedicated sampling equipment will consist of the following procedure:

- Gently tap or scrape to remove adhered soil
- Rinse with tap water
- Wash with Alconox detergent solution and scrub
- Rinse with tap water
- Rinse with distilled or deionized water

Drilling equipment will be decontaminated between sample locations. All spoons, if not disposable, will be decontaminated between sampling locations and between different sampling depths at the same location.

The oil water interface probe and low-flow cell will be rinsed with alcohol and distilled water between uses in different monitoring wells.

4.1 Investigation Derived Waste

Those soil cuttings needing to be managed on-site will be containerized in properly labeled Department of Transportation (DOT) approved 55-gallon drums for future off-site disposal at a permitted facility. All boreholes which require soil cuttings disposal would ultimately be filled with hydrated bentonite chips and asphalt/concrete capping.

Groundwater purged from the monitoring wells during development and sampling will be placed into DOT approved 55-gallon drums for future off-site disposal.

TABLES

Table 1
Sampling Rationale and Summary
261 Grand Concourse, Bronx, New York

Sample Matrix	Sample ID	Sample Interval (feet below surface grade)	Rationale	Estimated Number of Samples	Analysis
SOIL	SB-1 (Depth)	0'-2' (historic fill)	To assess the extent of historic fill and overall soil quality beneath the Site	1	Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), Pesticides, Total Analyte List (TAL) Metals, hexavalent chromium, trivalent chromium, per- and poly-fluoroalkyl substances (PFAS), and 1,4-dioxane
	SB-1 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-2 (Depth)	0'-2' (historic fill)		1	
	SB-2 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-3 (Depth)	0'-2' (historic fill)		1	
	SB-3 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-4 (Depth)	0'-2' (historic fill)		1	
	SB-4 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-5 (Depth)	0'-2' (historic fill)		1	
	SB-5 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-6 (Depth)	0'-2' (historic fill)		1	
	SB-6 (Depth)	Groundwater interface, if encountered or immediately above bedrock.		1	
	SB-DUP-1 (Depth)	Blind Duplicate: One per 20 soil samples	QA/QC	1	
	SB-MS/MSD (Depth)	One per 20 soil samples	QA/QC	1	
	FB-1	Field Blank	QA/QC	1	
	TB-1	Trip Blank: 1 per cooler per day (Lab-prepared)	QA/QC	1	TCL VOCs
			Total Quantity	16	
GROUNDWATER	MW-1	To be determined in the field based on groundwater depth	To assess groundwater quality beneath the Site	1	TCL VOCs, TCL SVOCs, PCBs, Pesticides, TAL Metals (filtered and unfiltered), hexavalent chromium, trivalent chromium, PFAS, and 1,4-dioxane
	MW-2	To be determined in the field based on groundwater depth		1	
	MW-3	To be determined in the field based on groundwater depth		1	
	MW-DUP-1	Blind Duplicate: One per 20 groundwater samples	QA/QC	1	
	MW-MS/MSD	One per 20 groundwater samples	QA/QC	1	
	FB-2	Field Blank	QA/QC	1	
	TB-2	Trip Blank: 1 per cooler per day (Lab-prepared)	QA/QC	1	TCL VOCs
			Total Quantity	7	
SOIL VAPOR	SV-1	Immediately below proposed excavation depth or 2 feet above groundwater	To evaluate soil vapor conditions beneath the Site	1	VOCs (TO-15)
	SV-2	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	SV-3	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	SV-4	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	SV-5	Immediately below proposed excavation depth or 2 feet above groundwater		1	
	AO-1	Field Blank	QA/QC	1	
			Total Quantity	6	

* Additional soil samples may be collected based on field conditions (i.e: elevated PID readings, odor, sheen, etc.)

Table 2
Preservation and Holding Times
261 Grand Concourse, Bronx, NY

Sample Matrix	Analysis	Container	Preservation	Holding Time
Soil and Soil QA/QC Samples	VOCs	Glass, Four 40-ml vials with teflon-lined cap: 2 VOA vials with 5-ml H_2O, 1 VOA vial with MeOH, and 1 blank vial or 5-g Encore samplers	Cool, 4°C	14 days
	SVOCs	Glass, 8-oz teflon-line cap	Cool, 4°C	14 days to extract, 40 days after extraction to analyze
	PCBs & Pesticides	Glass, 100-g tefloned-lined cap	Cool, 4°C	14 days to extract, 40 days after extraction to analyze
	Metals	Glass, 2-oz teflon-lined cap	Cool, 4°C	6 months (except for mercury 28 days)
	Chromium Hexavalent	Glass, 2-oz teflon-lined cap	Cool, 4°C	28 days
	PFAS	8-oz HDPE bottles	Cool, 4°C	28 days
	1,4-Dioxane	Glass, Four 40-ml vials with teflon-lined cap: 2 VOA vials with 5-ml H2O, 1 VOA vial with MeOH, and 1 blank vial or 5-g Encore samplers	Cool, 4°C	14 days
Groundwater and Groundwater QA/QC Samples	VOCs	Glass, three 40-mil vials with teflon-lined septum cap	HCl pH<2, no headspace, Cool, 4°C	14 days
	SVOCs	Glass, 1 liter with teflon-lined cap	Cool, 4°C	7 days to extract, 40 days after extraction to analyze
	PCBs &Pesticides	Glass, 1 liter with teflon-lined cap	Cool, 4°C	7 days to extract, 40 days after extraction to analyze
	Metals	Plastic, 250-ml	HNO_3 to pH<2, Cool, 4°C	6 months (except for mercury 28 days)
	Chromium Hexavalent	Plastic, 250-ml	Cool, 4°C	24 hours
	PFAS	250-ml HDPE bottles	Cool, 4°C	14 days
	1,4-Dioxane	Glass, 1 liter with teflon-lined cap	Cool, 4°C	7 days
Soil Vapor and Soil Vapor QA/QC Samples	VOCs	Summa Canister	None	30 days

FIGURE 1

PROPOSED SAMPLING PLAN



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Legend:

	Site Boundary
SB-X/MW-X	Proposed Soil Boring and Monitoring Well Location and Designated ID
SB-X	Proposed Soil Boring Location and Designated ID
W-X	Prior Soil Boring Location (2019 GEM Inv.) and Designated ID
SV-X	Proposed Soil Vapor Point Location and Designated ID
OA-1	Potential Ambient Air Sample and Designated ID

Notes:

1. All feature locations are approximate

Scale: 0 50' 100'

Figure No.	1
Figure Name:	Proposed Sampling Plan
Report:	QAPP
Date:	09/07/2021
Drawn By:	EK
Site Address:	261 Grand Concourse Bronx, New York

ATTACHMENTS

ATTACHMENT 1
NYSDEC GUIDANCE FOR PFAS SAMPLING

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

January 2021



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ERRATA SHEET for

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Routine Analysis, page 9	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101."	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533."	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	"In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils."	9/15/2020
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Water Sample Results Page 10	PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (…) If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (…) If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	9/15/2020
Soil Sample Results, page 10	"The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase."	"Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. " [Interim SCO Table] "PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP. As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. "	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Testing for Imported Soil Page 11	Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs. If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable. PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. [2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020
Additional Analysis, page 9	In cases… soil parameters, such as Total Organic Carbon (EPA Method 9060), soil…	In cases… soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil…	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021
Water Sample Results Page 9	"In addition, further assessment of water may be warranted if either of the following screening levels are met: a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L"	Deleted	6/15/2021

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix F) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS in matrices other than finished drinking water. However, laboratories analyzing environmental samples for PFAS (e.g., soil, sediments, and groundwater) under DER's Part 375 remedial programs need to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533. Laboratories should adhere to the guidelines and criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids). Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist.

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated

if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.[1]

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below.

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values.

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater[2]	1.1	3.7

[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

[2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf.

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
    - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an "Analytical Methods/Quality Assurance Summary Table" specifying:
    - Matrix type
    - Number or frequency of samples to be collected per matrix
    - Number of field and trip blanks per matrix
    - Analytical parameters to be measured per matrix
    - Analytical methods to be used per matrix with minimum reporting limits
    - Number and type of matrix spike and matrix spike duplicate samples to be collected
    - Number and type of duplicate samples to be collected
    - Sample preservation to be used per analytical method and sample matrix
    - Sample container volume and type to be used per analytical method and sample matrix
    - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by LC-MS/MS for PFAS using methodologies based on EPA Method 537.1
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
    - Reporting Limits should be less than or equal to:
        - Aqueous – 2 ng/L (ppt)
        - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101
- Include detailed sampling procedures
    - Precautions to be taken
    - Pump and equipment types
    - Decontamination procedures
    - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled “General Fish Handling Procedures for Contaminant Analysis” (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

   1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

   2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

   3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

   1. Project and Site Name.

   2. DEC Region.

   3. All personnel (and affiliation) involved in the collection.

   4. Method of collection (gill net, hook and line, etc.)

   5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

   1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

   2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

   3. Date collected.

   4. Sample location (waterway and nearest prominent identifiable landmark).

   5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate “Age” column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish’s tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:

No materials containing Teflon.
No Post-it notes.
No ice packs; only water ice or dry ice.
Any gloves worn must be powder free nitrile.
No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
Wash hands after handling any food containers or packages as these may contain PFCs.
Keep pre-wrapped food containers and wrappers isolated from fish handling.
Wear clothing washed at least six times since purchase.
Wear clothing washed without fabric softener.
Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name _____ DEC Region _____

Collections made by (include all crew) _____

Sampling Method: □Electrofishing □Gill netting □Trap netting □Trawling □Seining □Angling □Other _____

Preservation Method: □Freezing □Other _____ Notes (SWFDB survey number): _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, _____, of _____ collected the
(Print Name) (Print Business Address)

following on _____, 20____ from _____
(Date) (Water Body)

in the vicinity of _____
(Landmark, Village, Road, etc.)

Town of _____, in _____ County.

Item(s) _____

_____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on _____, 20_____.

_____ _____
Signature Date

I, _____, received the above mentioned sample(s) on the date specified and assigned identification number(s) _____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

_____ _____
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) developed the following guidelines for laboratories analyzing environmental samples for PFAS under DER programs. If laboratories cannot adhere to the following guidelines, they should contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov prior to analysis of samples.

Isotope Dilution

Isotope dilution techniques should be utilized for the analysis of PFAS in all media.

Extraction

For water samples, the entire sample bottle should be extracted, and the sample bottle rinsed with appropriate solvent to remove any residual PFAS.

For samples with high particulates, the samples should be handled in one of the following ways:

1. Spike the entire sample bottle with isotope dilution analytes (IDAs) prior to any sample manipulation. The sample can be passed through the SPE and if it clogs, record the volume that passed through.
2. If the sample contains too much sediment to attempt passing it through the SPE cartridge, the sample should be spiked with isotope dilution analytes, centrifuged and decanted.
3. If higher reporting limits are acceptable for the project, the sample can be diluted by taking a representative aliquot of the sample. If isotope dilution analytes will be diluted out of the sample, they can be added after the dilution. The sample should be homogenized prior to taking an aliquot.

If alternate sample extraction procedures are used, please contact the DER remedial program chemist prior to employing. Any deviations in sample preparation procedures should be clearly noted in the case narrative.

Signal to Noise Ratio

For all target analyte ions used for quantification, signal to noise ratio should be 3:1 or greater.

Blanks

There should be no detections in the method blanks above the reporting limits.

Ion Transitions

The ion transitions listed below should be used for the following PFAS:

PFOA	413 > 369
PFOS	499 > 80
PFHxS	399 > 80
PFBS	299 > 80
6:2 FTS	427 > 407
8:2 FTS	527 > 507
N-EtFOSAA	584 > 419
N-MeFOSAA	570 > 419

Branched and Linear Isomers

Standards containing both branched and linear isomers should be used when standards are commercially available. Currently, quantitative standards are available for PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As more standards become available, they should be incorporated in to the method. All isomer peaks present in the standard should be integrated and the areas summed. Samples should be integrated in the same manner as the standards.

Since a quantitative standard does not exist for branched isomers of PFOA, the instrument should be calibrated using just the linear isomer and a technical (qualitative) PFOA standard should be used to identify the retention time of the branched PFOA isomers in the sample. The total response of PFOA branched and linear isomers should be integrated in the samples and quantitated using the calibration curve of the linear standard.

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated for each target analyte and the ratio compared to standards. Lab derived criteria should be used to determine if the ratios are acceptable.

Reporting

Detections below the reporting limit should be reported and qualified with a J qualifier.

The acid form of PFAS analytes should be reported. If the salt form of the PFAS was used as a stock standard, the measured mass should be corrected to report the acid form of the analyte.

Appendix I - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report. Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 14 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of five standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%. Linear fit calibration curves should have an R^2 value greater than 0.990.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
R^2 >0.990	J flag detects and UJ non detects
Low-level calibration check <50% or >150%	J flag detects and UJ non detects
Mid-level calibration check <70% or >130%	J flag detects and UJ non detects

Initial Calibration Verification

An initial calibration verification (ICV) standard should be from a second source (if available). The ICV should be at the same concentration as the mid-level standard of the calibration curve.

ICV recovery <70% or >130%	J flag detects and non-detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated from the standards for each target analyte. Lab derived criteria should be used to determine if the ratios are acceptable. If the ratios fall outside of the laboratory criteria, qualify results as an estimated maximum concentration.

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Branched and Linear Isomers

Observed branched isomers in the sample that do not have a qualitative or quantitative standard should be noted and the analyte should be qualified as biased low in the final data review summary report. Note: The branched isomer peak should also be present in the secondary ion transition.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

ATTACHMENT 2

LABORATORY STANDARD OPERATING PROCEDURE SUMMARY FOR PFAS

Standard Operating Procedure - Summary
PFAS in Groundwater, Surface water and Soils

1.0 Summary

Target PFAS compounds are prepared and analyzed using EPA Method 537.1 modified. Aqueous and Soil samples are fortified with isotopic surrogates of the target PFAS compounds, extracted and concentrated to a known volume. The extracts are then analyzed employing LC-MSMS techniques.

Each preparation batch (per matrix) includes a preparation blank, lab control sample (blank spike), sample matrix spike and matrix spike duplicate and up to 20 samples.

2.0 Sample Preparation

Sample preparation involves extraction/clean-up and final concentration to a known volume before analysis. Isotopic surrogates are added to all preparation batch samples/QC.

2.1 Aqueous Samples

A known volume of sample is spiked with isotopic surrogates and extracted using Solid Phase Extraction (SPE) techniques. The SPE tubes are eluted with solvent and the eluant is then concentrated using nitrogen evaporation to a final volume of 1.0 mL. The final concentrated extract is fortified with Internal Standard and analyzed by LC-MSMS.

2.2 Soil Samples

A known weight of sample is fortified with isotopic surrogates, mixed then extracted in methanolic potassium hydroxide employing vortex mixing, followed by orbital shaking and finally ultrasonic extraction.

The extract is centrifuged and the supernatant solvent is quantitatively poured off and a small volume of PFAS free water is added to the solvent. The solvent mixture is evaporated using nitrogen evaporation and the remaining aqueous extract is brought to a known volume with PFAS free water.

The aqueous extract is then pH adjusted to 6-8 using glacial acetic acid and the resulting aqueous solution is extracted using SPE techniques. The SPE tube is eluted with solvent and the eluant is then concentrated using nitrogen evaporation to a final volume of 2.0 mL. The final concentrated extract is fortified with Internal Standard and analyzed by LC-MSMS.

3.0 **Analysis**

Analysis is conducted utilizing an Agilent Infinity 1290 HPLC system interfaced to an Agilent 6470AAR LC-MSMS with an Agilent Jet Stream-ElectroSpray Ionization (AJS-ESI)interface. The system is operated in the dynamic MRM (multiple reaction monitoring) mode for specific PFAS target isotopes and native analogs.

Where possible, multiple MRM transitions are used for targets and isotopes. Some species only exhibit single MRM transitions. Precursors and product ions are used for Quantitative and Qualitative purposes respectively.

3.1 Initial Calibration

The LC-MSMS is calibrated with 7 standards of a total of 40 isotopes and analog target PFAS compounds. Calibration is conducted from 0.25 to 20 ng/mL. Calibration employs internal standard techniques and either average response factor or quadratic regression is used depending upon the best calibration model based upon accuracy across the calibration range.

3.2 Continuing Calibration Verification

Each analytical sequence includes an opening continuing calibration verification (CCV) and a CCV after every 10 injections and at the end of the analysis sequence.

The CCV acceptance criteria are $\pm$ 30% of the expected value. Internal Standard areas are acceptable when -50% to +50% of the average response in the initial calibration.

3.3 Isotopic Surrogates (Isotope Dilution Analytes (IDA)

18 IDAs are utilized for this procedure. These isotopes are used to correct for recovery of detected target analog PFAS compounds through the preparation/analysis processes. The recovery limits currently are 25-150 % recovery and these limits are adjusted based upon laboratory determined control limits when sufficent data points per matrix are available.

3.4 Method Blanks (MBLK)

Each preparation batch includes a laboratory method blank. Any result greater than the Reporting Limit or 2 ng/L (aqueous) or 0.5 ug/kG (soil) is "B" flagged according with the exception of any detection of PFOA, PFOS or PFNA above the RL will require re-extraction of the batch.

3.5 Blank Spike (LCS)

Each preparation batch includes and BS/LCS. Recoveries are calculated and based upon isotope dilution. Recovery acceptance limits are 50-150% with RPD of 30% for a BSD if performed.

3.6 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

Each preparation batch includes and MS/MSD pair. Recoveries are calculated and based upon isotope dilution. Recovery acceptance limits are 25-150% with RPD of 35% for samples.

4.0 Data Review and Reporting

All quantitation reports and LIMS output files are generated using the Agilent Mass Hunter reporting programs. The Quant reports include all Quantitative data and MRM transition data which are reviewed. The LIMS output file is in a format that allows upload to Element LIMS.

Isotope Dilution calculations are performed using our custom PFAS.mdb program which automatically uploads to the LIMS output file for upload to Element LIMS.

Once uploaded to ELEMENT, any exceptions/outliers are noted, flagged and set to reviewed.

All data reported are isotopically corrected for all QC and samples.

5.0 Revision History

May 1, 2019 Revision 1.0 First Issue

6.0 Approvals:

Laboratory Director Ben Gulizia

Corp. Technical Director Robert Bradley

Corp. QA Officer Sarah Widomski

ATTACHMENT 3

LABORATORY CERTIFICATION AND REPORTING LIMITS FOR PFAS

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2020
Issued April 01, 2019
Revised April 30, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. KRZYSZTOF TRAFALSKI
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 (2003) for the category ENVIRONMENTAL ANALYSES POTABLE WATER
All approved analytes are listed below:

Perfluorinated Alkyl Acids

Perfluorooctanesulfonic acid (PFOS)	EPA 537
Perfluorooctanoic acid (PFOA)	EPA 537

NEW YORK STATE | Department of Health

Serial No.: 60182

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.

NELAP RECOGNIZED TNI ACCREDITATION BODY

York Analytical Laboratories, Inc.

10/30/2019

Analytical Method Information

PFAS Target compounds by LC/MS-MS

Dept.: PFAS

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
PFAS, NYSDEC Target List in Water (EPA 537m)					Units: ng/L			
Preservation: Cool 4°C						**Hold Time to Analysis** 28 days		
Container: 10_250mL Plastic Cool to 4° C		**Amount Required:** 250 mL				**Hold Time to Extr.** 14 days		
1H,1H,2H,2H-Perfluorodecanesulfonic aci	0.877	2.00 ng/L		30	25 - 150	35	50 - 130	30
1H,1H,2H,2H-Perfluorooctanesulfonic aci	1.16	5.00 ng/L		30	25 - 150	35	50 - 130	30
surr: d3-N-MeFOSAA			25 - 150					
surr: d5-N-EtFOSAA			25 - 150					
surr: M2-6:2 FTS			25 - 150					
surr: M2-8:2 FTS			25 - 150					
surr: M2PFTeDA			10 - 150					
surr: M3PFBS			25 - 150					
surr: M3PFHxS			25 - 150					
surr: M4PFHpA			25 - 150					
surr: M5PFHxA			25 - 150					
surr: M6PFDA			25 - 150					
surr: M7PFUdA			25 - 150					
surr: M9PFNA			25 - 150					
MPFOA		0.100 ng/L						
N-EtFOSAA	0.436	2.00 ng/L		30	25 - 150	35	50 - 130	30
N-MeFOSAA	0.364	2.00 ng/L		30	25 - 150	35	50 - 130	30
surr: Perfluoro-1-[13C8]octanesulfonamid			10 - 150					
surr: Perfluoro-1-[13C8]octanesulfonic aci			25 - 150					
Perfluoro-1-decanesulfonic acid (PFDS)	0.491	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluoro-1-heptanesulfonic acid (PFHpS)	0.418	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluoro-1-octanesulfonamide (FOSA)	0.877	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorobutanesulfonic acid (PFBS)	0.436	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorodecanoic acid (PFDA)	0.493	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorododecanoic acid (PFDoA)	0.611	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluoroheptanoic acid (PFHpA)	0.447	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorohexanesulfonic acid (PFHxS)	0.494	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorohexanoic acid (PFHxA)	0.442	2.00 ng/L		30	25 - 150	35	50 - 130	30
surr: Perfluoro-n-[1,2-13C2]dodecanoic ac			25 - 150					
surr: Perfluoro-n-[13C4]butanoic acid (MF			25 - 150					
surr: Perfluoro-n-[13C5]pentanoic acid (M			25 - 150					
surr: Perfluoro-n-[13C8]octanoic acid (M8			25 - 150					
Perfluoro-n-butanoic acid (PFBA)	1.01	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorononanoic acid (PFNA)	0.361	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorooctanesulfonic acid (PFOS)	0.472	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorooctanoic acid (PFOA)	0.360	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluoropentanoic acid (PFPeA)	0.511	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorotetradecanoic acid (PFTA)	0.701	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluorotridecanoic acid (PFTrDA)	0.660	2.00 ng/L		30	25 - 150	35	50 - 130	30
Perfluoroundecanoic acid (PFUnA)	0.534	2.00 ng/L		30	25 - 150	35	50 - 130	30

York Analytical Laboratories, Inc.

10/30/2019

Analytical Method Information

PFAS Target compounds by LC/MS-MS

Dept.: PFAS

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
PFAS, NYSDEC Target List in Soil (EPA 537m)					Units: ug/kg			
Preservation: Cool 4°C						**Hold Time to Analysis** 28 days		
Container: 10_250mL Plastic Cool to 4° C		**Amount Required:** 250 mL				**Hold Time to Extr.** 14 days		
1H,1H,2H,2H-Perfluorodecanesulfonic aci	0.344	0.750 ug/kg		30	25 - 150	35	50 - 130	30
1H,1H,2H,2H-Perfluorooctanesulfonic aci	0.521	0.750 ug/kg		30	25 - 150	35	50 - 130	30
surr: d3-N-MeFOSAA			25 - 150					
surr: d5-N-EtFOSAA			25 - 150					
surr: M2-6:2 FTS			25 - 150					
surr: M2-8:2 FTS			25 - 150					
surr: M2PFTeDA			10 - 150					
surr: M3PFBS			25 - 150					
surr: M3PFHxS			25 - 150					
surr: M4PFHpA			25 - 150					
surr: M5PFHxA			25 - 150					
surr: M6PFDA			25 - 150					
surr: M7PFUdA			25 - 150					
surr: M9PFNA			25 - 150					
MPFOA								
N-EtFOSAA	0.109	0.750 ug/kg		30	25 - 150	35	50 - 130	30
N-MeFOSAA	0.0910	0.750 ug/kg		30	25 - 150	35	50 - 130	30
surr: Perfluoro-1-[13C8]octanesulfonamid			10 - 150					
surr: Perfluoro-1-[13C8]octanesulfonic aci			25 - 150					
Perfluoro-1-decanesulfonic acid (PFDS)	0.177	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluoro-1-heptanesulfonic acid (PFHpS)	0.198	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluoro-1-octanesulfonamide (FOSA)	0.455	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorobutanesulfonic acid (PFBS)	0.109	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorodecanoic acid (PFDA)	0.123	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorododecanoic acid (PFDoA)	0.110	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluoroheptanoic acid (PFHpA)	0.112	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorohexanesulfonic acid (PFHxS)	0.106	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorohexanoic acid (PFHxA)	0.111	0.750 ug/kg		30	25 - 150	35	50 - 130	30
surr: Perfluoro-n-[1,2-13C2]dodecanoic ac			25 - 150					
surr: Perfluoro-n-[13C4]butanoic acid (MF			25 - 150					
surr: Perfluoro-n-[13C5]pentanoic acid (M			25 - 150					
surr: Perfluoro-n-[13C8]octanoic acid (M8			25 - 150					
Perfluoro-n-butanoic acid (PFBA)	0.278	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorononanoic acid (PFNA)	0.0900	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorooctanesulfonic acid (PFOS)	0.118	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorooctanoic acid (PFOA)	0.0900	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluoropentanoic acid (PFPeA)	0.211	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorotetradecanoic acid (PFTA)	0.192	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluorotridecanoic acid (PFTrDA)	0.132	0.750 ug/kg		30	25 - 150	35	50 - 130	30
Perfluoroundecanoic acid (PFUnA)	0.133	0.750 ug/kg		30	25 - 150	35	50 - 130	30

ATTACHMENT 4
CHAIN OF CUSTODY EXAMPLES

York Analytical Laboratories, Inc.
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clientservices@yorklab.com
www.yorklab.com

YORK
ANALYTICAL LABORATORIES INC

Field Chain-of-Custody Record

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

YORK Project No.

Page _____ of _____

YOUR Information	Report To:	Invoice To:
Company:	Company:	Company:
Address:	Address:	Address:
Phone.:	Phone.:	Phone.:
Contact:	Contact:	Contact:
E-mail:	E-mail:	E-mail:

YOUR Project Number

YOUR Project Name

YOUR PO#:

Turn-Around Time

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

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

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

Matrix Codes

S - soil / solid
GW - groundwater
DW - drinking water
WW - wastewater
O - Oil ⋮ Other

Samples From

New York	
New Jersey	
Connecticut	
Pennsylvania	
Other	

Report / EDD Type (circle selections)

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

YORK Reg. Comp.

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

Sample Identification	Sample Matrix	Date/Time Sampled	Analysis Requested	Container Description

Comments:

Preservation: (check all that apply)

HCl ___ MeOH ___ HNO_3 ___ H_2SO_4 ___ NaOH ___ ZnAc ___
Ascorbic Acid ___ Other: _____

Special Instruction

Field Filtered ____
Lab to Filter _____

Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time
Samples Received by / Company	**Date/Time**	**Samples Relinquished by / Company**	**Date/Time**	**Samples Received by / Company**	**Date/Time**
Samples Relinquished by / Company	**Date/Time**	**Samples Received by / Company**	**Date/Time**	**Samples Received in LAB by**	**Date/Time**

Temp. Received at Lab

Degrees C

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

Field Chain-of-Custody Record - AIR

YORK Project No.

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

YOUR Information	Report To:	Invoice To:
Company:	Company:	Company:
Address:	Address:	Address:
Phone.:	Phone.:	Phone.:
Contact:	Contact:	Contact:
E-mail:	E-mail:	E-mail:

YOUR Project Number

YOUR Project Name

YOUR PO#:

Turn-Around Time

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

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

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

Air Matrix Codes

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

Samples From

New York	
New Jersey	
Connecticut	
Pennsylvania	
Other	

Report / EDD Type (circle selections)

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

YORK Reg. Comp.

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

Certified Canisters: Batch ___ Individual ___

Please enter the following REQUIRED Field Data

Reporting Units: ug/m^3 ___ ppbv ___ ppmv ___

Sample Identification	Date/Time Sampled	Air Matrix	Canister Vacuum Before Sampling (in Hg)	Canister Vacuum After Sampling (in Hg)	Canister ID	Flow Cont. ID	Analysis Requested

Comments:

Detection Limits Required

≤ 1 ug/m^3 _____ NYSDEC V1 Limits _____
Routine Survey _____ Other _____

Sampling Media

6 Liter Canister	
Tedlar Bag	

Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time
Samples Received by / Company	**Date/Time**	**Samples Relinquished by / Company**	**Date/Time**	**Samples Received by / Company**	**Date/Time**
Samples Relinquished by / Company	**Date/Time**	**Samples Received by / Company**	**Date/Time**	**Samples Received in LAB by**	**Date/Time**

ATTACHMENT 5
RESUMES

vEKtor consultants

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Ezgi Karayel
Principal
ezgi@vektorconsultants.com

Ezgi Karayel is an environmental engineer with over 10 years of experience in soil, groundwater, air and solid waste management. She is the Principal of Vektor Consultants and serves as Operations Officer of the firm. Ms. Karayel guides firm's clients through their due diligence processes. Her professional experience includes managing various types of projects from environmental site assessments to remediation projects, including but not limited to, performing Phase I and Phase II Environmental Site Assessments at residential, commercial and industrial properties throughout New York City Metropolitan area and New Jersey, managing Brownfield redevelopment and E-Designation projects, spill closures, excavation support and supervision, tank removals and preparation of all associated reports. She also supervises field activities including underground and aboveground tank storage tank removals, installation of vapor barrier systems and sub-slab depressurization systems. She has put together numerous soil disposal plans for excavated materials. Ms. Karayel has managed over fifty properties in support of remediation as part of New York City Mayor's Office of Environmental Remediation. She also performs Quality Control and Quality Assurance of various reports prior to submittal to agencies.
Ms. Karayel is a member of the Board of Directors and Vice President of the New York City Brownfield Partnership.

Education

B.S. – Environmental Engineering
University at Buffalo, New York

Professional Registration and Affiliations

OSHA 10-hour Construction and 40-hour General Industry
OSHA 40-hour HAZWOPER and 8-hour HAZWOPER Refresher
Certificate Training for Underground Storage Tanks in NJ
Certified Environmental Manager and Certified Environmental Inspector
New York City Office of Environmental Remediation Gold Certified Consultant
Vice President of NYC Brownfield Partnership
Advisory Board Member of Brownfield Coalition of the Northeast

Select Projects

Linden Boulevard, Queens, New York – Confidential Client – Senior Project Manager for a Site Investigation and Remediation of a 7-acre former landfill with a Restrictive Declaration. The scope of work for the project included preparation of a Remedial Investigation Work Plan for review and approval by the NYCOER, NYSDEC and NYCDOH, implementation of Remedial Investigation, preparation of Remedial Investigation Report, Remedial Action Work Plan, preparation and implementation of a waste characterization plan for soils for proper disposal, supervision of site remediation activities, coordination with remediation engineer to design a methane mitigation system as well as vapor barrier system and managing field staff during remediation.

Former Tunnel Diner, Jersey City, New Jersey – SL Hospitality – Project Manager for a Remedial Investigation (RI) of a 1/2-acre property in accordance with the New Jersey Technical Requirements for Site Remediation. Ms. Karayel worked closely with the Licensed Site Remediation Professional (LSRP) of the project. Followed by the approval of the RAWP prepared by her, Ms. Karayel directed remediation activities at the site and managed field staff on a daily basis. Upon completion of remediation, she has prepared Remedial Action Outcome for review and certification of the LSRP.

Williamsburg, Brooklyn, New York – Confidential Client – As a Project Director for a Remedial Investigation of a former auto repair shop with an active spill, Ms. Karayel was responsible for remediation of the property under the direct supervision of NYCOER and NYSDEC. Her responsibilities consisted of preparing the required reports and supervision of remediation including excavation, and installation of engineering controls. By successful coordination with NYCOER, she has managed to enroll the project in City's Clean Soil Bank program and saving the client over $160,000 for soil disposal.

9029 Flatlands Avenue, Brooklyn, New York – Gambino + LaPorta Architecture, PC – Senior Project Manager for a commercial development with an E-Designation for HazMat. Her scope of work started with performance of a Phase I ESA prior to development, followed by remedial investigation and preparation of Remedial Investigation Report and Remedial Action Work Plan for the remediation. Remediation for the project included design and implementation of an active sub-slab depressurization system. For the engineering controls design and implementation, Ms. Karayel worked closely with the Professional Engineer for the project and performed all required pilot tests, initial start-up and inspections.

37-23 33rd Street, Queens, New York – 3723 33rd Street LLC – As a Senior Project Manager for a "P" Designated property by the NYSDEC, Ms. Karayel managed to prevent the property from becoming a Class II site by performing a thorough due-diligence and disproving the prior consultant's findings and recommendations. Furthermore, her due-diligence study and evaluation saved the client over $1,000,000 clean-up costs, regulatory and legal fees.

vEKtor consultants

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John Driscoll
Project Manager
john@vektorconsultants.com

John Driscoll is a project manager with experience in geotechnical and environmental sampling. As a project manager, he is responsible of providing range of consulting services with diverse clientele primarily in in real estate development, property management, and public service sectors. His professional experience includes conducting Phase I Environmental Site Assessments, environmental investigations of soil, groundwater and vapor media, and project management for developments with environmental conditions.

Professional Experience

Environmental Scientist — June 2017 – Present
vEKtor consultants, LLC, New York, NY

Project Manager — 2015 – 2016
ALC Environmental, New York, NY

Environmental Scientist/Geologist — 2012 – 2015
Athenica Environmental Services, Inc., Queens, NY

Field Engineer — 2012
Landmark Consultants Corporation, Brooklyn, NY

Education

Bachelor of Science – Environmental Resource Management – Soil Science, 2012
The Pennsylvania State University

Professional Registration and Affiliations

OSHA 40-hour HAZWOPER and 8-hour HAZWOPER Refresher
OSHA 30-hour General Construction
OSHA 8-hour Confined Space
New York State Emergency Medical Technician – Basic (EMT-B)
PADI Advanced Open Water Scuba Certification

vEKtor consultants

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Matthew Brown
Environmental Scientist
mbrown@vektorconsultants.com

Matthew Brown is an environmental scientist with over five years of experience. He is responsible for conducting field investigations and site assessments. His responsibilities include providing environmental oversight at construction project sites in New York City Metropolitan area, performing site visits and preparing Phase I Environmental Site Assessments, as well as, performing Phase II Environmental Site Assessments and preparing associated reports. His experience coordinating with regulatory agencies provides knowledge and insight for navigating projects through different regulatory programs.

Education

B.S. Environmental Science, Minor in Hydrogeology
State University of New York Plattsburgh

Professional Registration and Affiliations

OSHA 40-hour HAZWOPER and 8-hour HAZWOPER Refresher
OSHA 30-hour General Construction
OSHA 8-hour Confined Space
Certificate Training for Underground Storage Tanks in NJ
NYS DOL Asbestos Handler License
NYC DEP Asbestos Handler License
Adult, Child, and Infant CPR, AED, and First Aid (NHPCS)
Society of Environmental Toxicology and Chemistry (Membership Number 54703806)

Select Projects

- 625 & 658 Driggs Avenue, Brooklyn - Responsible for oversight of remediation during construction activities, collection of samples, preparing status reports and coordinating with regulatory agencies.
- Kingston, New York – NYCDEP – Utilized water quality, hydrological and climate data to assist in the construction of statistical models to predict concentrations of the protozoans *Cryptosporidium* and *Giarda* in upstate reservoirs.
- Vallaha, New York – NYSDEC – Participated in Early Warning Surveillance (EWS) program jointly administered by DEP Bureau of Drinking Water Quality Control and US Army Corp of Engineers. Collected and analyzed water samples in the field with multiprobes. Maintained prototype bioassay system using bluegill sunfish (*Lepomis macrochirus*) for real-time water quality monitoring.

APPENDIX C

HEALTH AND SAFETY PLAN (HASP)

vEKtor consultants

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www.vektorconsultants.com

HEALTH AND SAFETY PLAN

Prepared For: 261 Grand Concourse LLC

Project Name: Copyrite Plastic Sheets

Project Location: 261 Grand Concourse, Bronx, New York

Date: September 7, 2021

37 West 37th Street, 6th Floor, New York, NY 10018

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Attachment 3: Directions to Hospital

Emergency Contacts			
Position	**Name**	**Organization**	**Phone**
Project Director, QEP	Ezgi Karayel	Vektor Consultants	(347) 871-0750
Project Manager	John Driscoll	Vektor Consultants	(347) 871-0750
Site Supervisor	Abe Smilowitz	YHN Construction	(718) 874-3741
Site Health and Safety Supervisor	Matthew Brown	Vektor Consultants	(347) 871-0750
Client Contact	Josh Veiner	261 Grand Concourse LLC	(718) 977-5666
Emergency Response		FDNY	911
Spill Hotline		NYSDEC	(800) 457-7362

Emergency Medical Facility	
Primary	***Alternate***
Lincoln Medical Center 234 East 149th Street, Bronx, New York Tel: (718) 579-5000 Open 24 Hours	Harlem Hospitals 506 Lenox Avenue, New York, New York Tel: (212) 939-1000 Open 24 Hours
Route to emergency medical facility map attached to back of this health & safety plan	

Sign-in Sheet

Name	Signature	Company	Date

1.0 INTRODUCTION

This Health and Safety Plan Plan (HASP) has been prepared on behalf of 261 Grand Concourse LLC for the implementation of a remedial investigation (RI) by Vektor Consultants, LLC (Vektor) and its subcontractors at the property located at 261 Grand Concourse, Bronx, New York (the Site). The Site is identified by the City of New York as Borough of Bronx, Block 2344 and Lot 1.

This HASP describes lines of authority, responsibility, and communication as they pertain to health and safety functions at this site in compliance with *29 CFR 1910.120(b)(2) and 29 CFR 1926.65(b)(2)*. This plan also details key personnel who are responsible for the development and implementation of the HASP. Vektor field personnel will implement this HASP during the remedial investigation (RI).

1.1 Site Location and Description

The Site is located on the west side of Grand Concourse and east side of Walton Avenue between East 138th Street to the south and East 140th Street to the north within the Mott Haven section of Bronx County, New York. The Site consists of one tax lot that is approximately 10,242-square feet (0.235 acres). The legal description of the subject property is Block 2344 and Lot 1. A site location map is provided as Figure 1.

The Site is currently developed with a two-story slab on grade building. The two-story building is currently vacant and consists of office space in the southern section of the first floor, warehouse space in the northern portion of the first floor, and former offices on the second floor. The entire site is covered by the concrete building slab with no exposed soil.

1.2 Summary of Previous Investigations

The following reports were reviewed during the preparation of this HASP in order to determine potential hazards:

Limited Subsurface Investigation by Gallinger Environmental Management Corp., dated December 19, 2019

- Gallinger Environmental Management Corp. (GEM) prepared this report on behalf of NOBR 261 LLC.
- At the time of the GEM investigation, the subject property consisted of the current two-story commercial building with a parking garage, tool storage area, carpenter shop, loading dock, lobby, and offices.
- GEM's limited investigation consisted of a limited geophysical survey, installation of fourteen soil borings, and collection of six soil samples.

- GEM identified a possible underground storage tank (UST) fill pipe in the parking garage. The geophysical scan revealed a strong signal extending approximately six feet off the pipe, indicative of a UST.
- Select soil samples were analyzed for CP-51 list volatile organic compounds (VOCs) via USEPA Method 8260C and semi-volatile organic compounds (SVOCs) via USEPA Method 8270D.
- Shallow bedrock was encountered across the subject property at depths ranging between 3 and 5 feet bgs. Groundwater was not encountered during the investigation.
- Fill material consisting of sand, brick, concrete, and asphalt was encountered from 1-foot bgs to the bedrock surface.
- No VOCs were detected in the soil samples.
- SVOCs, consisting of polycyclic hydrocarbons (PAHs), were detected in all six soil samples. Of these, benzo(a)anthracene (max. of 8.2 mg/kg), benzo(a)pyrene (max. of 6.9 mg/kg), benzo(b)fluoranthene (max. of 6.4 mg/kg), benzo(k)fluoranthene (max. of 5.7 mg/kg), chrysene (max. of 7.4 mg/kg), dibenzo(a,h)anthracene (max. of 2.1 mg/kg) and indeno(1,2,3-cd)pyrene (max. of 3.9 mg/kg) were detected at concentrations exceeding their respective NYSDEC Part 375 Restricted Residential Use Soil Cleanup Objectives (SCOs) in three of the soil samples.

Based on the limited soil investigation, the primary contaminants of concern are SVOCs. Soil samples obtained during the 2019 investigation were compared to 6 NYCRR Part 375 Unrestricted Use SCOs and Restricted Residential Use SCOs based on the anticipated residential use of the Site.

Phase I Environmental Site Assessment by Vektor Consultants, dated July 9, 2021

- Vektor conducted a Phase I Environmental Site Assessment (ESA) on behalf of the Requestor in accordance with ASTM E1527-13.
- At the time of the site reconnaissance on July 1, 2021, the Site consisted of one irregular-shaped lot that is approximately 10,242-square feet in area and was developed with a two-story slab on grade building. The two-story building was vacant and consisted of an office space in the southern section of the first floor, warehouse space in the northern portion of the first floor, and former offices on the second floor.

The Phase I ESA has revealed the following recognized environmental conditions (RECs) in connection with the subject property:

- Based on the available review of available Fire Insurance Maps and City Directory listings, the subject property was utilized as part of a gasoline station in 1935, as a plastic products manufacturing facility from 1947 until at least 1951, and as various commercial and industrial uses at least until 2017.

- Presence of SVOCs at concentrations exceeding their respective Unrestricted Use SCOs and Restricted Residential Use SCOs in soil beneath the Site that were identified during the 2019 GEM limited investigation.

This Phase I ESA revealed the following environmental issues in connection with the subject property:

- Listing on the New York E-Designation database (E-227) for hazardous materials, noise, and air quality as a result of rezoning of the general surrounding area (Lower Concourse Rezoning and Related Actions (CEQR # 08DCP071X)).
- Adjacent properties of environmental concern were identified as follows: the west adjacent properties across Walton Avenue were used as a piano factory and lumber storage facility (1908-1935), auto wrecking yard (1944-1951), cleansers manufacturer (1947), a service center (1956), and a gasoline station (1951-Present); the east adjacent property across Grand Concourse was used as a gasoline station (1935), and auto repair facilities (1944-2017); and the south adjacent property across East 138th Street was used as gasoline stations and auto repairs (1935).

1.3 Remedial Investigation

A Remedial Investigation (RI) proposed herein will supplement the prior assessments to characterize the nature and extent of contamination at the Site. The supplemental data will be analyzed to characterize the nature and extent of contamination at the Site and to evaluate remedial action alternatives.

The proposed remedial investigation will consist of the following scope of work:

- Geophysical survey to locate unidentified underground storage tanks (USTs) and identify utilities in the vicinity of the proposed boring locations,
- Installation of six soil borings to refusal/bedrock (assumed at a maximum of 5 feet bgs) across the Site and collection of twelve soil samples and additional quality assurance /quality control (QA/QC) samples,
- Installation of three monitoring wells and collection of three groundwater samples and additional QA/QC samples,
- Installation of five soil vapor points and collection of five soil vapor samples and one ambient air sample as a QA/QC.
- Air monitoring during the RI.

A direct push drill-rig operated by a licensed driller subcontractor will be utilized for the installation of soil borings, monitoring wells, and soil vapor points at the Site.

2.0 ORGANIZATIONAL STRUCTURE

Vektor will provide a copy of this HASP to each contractor and subcontractor in accordance with 29 CFR 1910.120(b)(1)(iv) and 29 CFR 1926.65(b)(1)(iv) to inform them of site hazards and emergency procedures. All contractors and subcontractors are solely responsible for the safe and healthful performance of all work by each of its employees and/or support personnel who may enter the Site. Each contractor and subcontractor shall provide its own HASP as required by 29 CFR 1910.120 and 29 CFR 1926.65. However, they need to submit a copy of their HASP to Vektor or they can adopt this HASP during the RI activities.

2.1 Site Supervisor

As required by *29 CFR 1910.120(b)(2)(i)(A) and 29 CFR 1926.65(b)(2)(i)(A)*, Abe Smilowitz is the Site Supervisor. The Site Supervisor is responsible for directing all hazardous waste operations. All other site personnel report directly to the Site Supervisor unless otherwise noted. The Site Supervisor is directly responsible for:

- Ensuring the pre-entry briefing and/or tailgate-safety meetings are held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of site hazards
- Ensuring that all work activities conducted are consistent with this HASP and making any modifications as necessary
- Verifying all Job Hazard Analyses and ensuring that ongoing Hazard Analysis is conducted at this Site
- Overseeing the training program and ensuring that employees are trained for all tasks or operations they are asked to perform
- Providing a copy of this HASP to each contractor and subcontractor
- Updating the Site Control Program as needed
- Granting site workers site and zone access approval
- Registering all site visitors
- Establishing and maintaining security measures for this Site
- Directing how each work zone is adjusted
- Notified if emergency assistance is needed
- Supervising PPE use on this Site
- Approving any changes in PPE used on this Site
- Notified when any hazardous-substance spill occurs
- Evaluating the quality and safety of response activities after every emergency incident or evacuation of this Site
- Providing site workers with notifications and training on changes to the emergency response plan

- Evaluating confined spaces and responsible for the confined space permit program
- Performing initial monitoring to identify and evaluate any hazardous atmospheres during confined space operations
- Implementing the thermal stress program
- Authorizing the hot-work plan and cutting and welding operations
- Inspecting the hot-work permit area before work is authorized
- Monitoring site activities as they pertain to health and safety at this site
- Stopping any unsafe acts that pose an immediate or imminent health and safety hazard to anyone at this site
- Ensuring that all elements of this HASP are followed and correctly implemented
- Updating the Site Health and Safety Supervisor and other applicable personnel as to changes or work progress reports that may pertain to health and safety functions at this site
- Setting up decontamination lines and the solutions appropriate for the type of chemical contamination on Site
- Controlling the decontamination of all equipment, personnel and samples from the contaminated areas
- Ensuring that all required decontamination equipment is available and in working order
- Providing for collection, storage and disposal of decontamination waste (e.g., rinse water, contaminated sediment, etc.)

2.2 Site Health and Safety Supervisor

As required by *29 CFR 1910.120(b)(2)(i)(B) and 29 CFR 1926.65(b)(2)(i)(B)*, Matthew Brown (or designated alternate) is the Site Health and Safety Supervisor who has the responsibility and authority for all functions that may pertain to health and safety at this site. This is the individual located on a hazardous waste site that is responsible to the Site Supervisor and has the authority and knowledge necessary to implement the HASP and verify compliance with applicable safety and health requirements. The Site Health and Safety Supervisor is directly responsible for:

- Providing a copy of this HASP to each contractor and subcontractor
- Updating the Site Control Program as needed
- Notified if emergency assistance is needed
- Supervising PPE use on this Site
- Approving any changes in PPE used on this Site
- Notified when any hazardous-substance spill occurs
- Providing site workers with notifications and training on changes to the emergency response plan
- Performing initial monitoring to identify and evaluate any hazardous atmospheres during confined space operations
- Developing and implementing the HASP

- Monitoring site activities as they pertain to health and safety at this Site
- Stopping any unsafe acts that pose an immediate or imminent health and safety hazard to anyone at this Site
- Ensuring that all elements of this HASP are followed and correctly implemented
- Verifying compliance of subcontractors with respect to this HASP and reporting deviations to the Site Supervisor
- Evaluating site incidents including spills, releases of hazardous substances
- Determining the appropriate response including site evacuations
- Implementing the Emergency Response Plan
- Coordinating emergency response activities on this Site

2.3 Contractors and Subcontractors

Each contractor and subcontractor shall designate a Contractor Site Representative. The Contractor Site Representative will interface directly with the Site Supervisor, and Vektor Consultants, the Site Health and Safety Supervisor, with regards to all areas that relate to this HASP and safe and healthful performance of work conducted by the contractor and/or subcontractor workforce. Contractor/Subcontractor Site Representatives for this site are listed in the Contact Summary Table at the end of this section.

2.4 Local/State/Federal Agency Representative

Local, state, and/or federal agencies are responsible for ensuring the Site is in compliance with appropriate regulatory requirements, permits, and/or legal ruling(s). Local/State/Federal Agency Representatives for this Site are listed in the Contact Summary Table at the end of this section.

The organizational structure shall be reviewed and updated as necessary to reflect the current status of site operations.

Contact Summary Table

Position	Name	Organization	Phone
Project Director, QEP	Ezgi Karayel	Vektor Consultants	(347) 871-0750
Project Manager	John Driscoll	Vektor Consultants	(347) 871-0750
Site Supervisor	Abe Smilowitz	YHN Construction	(718) 874-3741
Site Health and Safety Supervisor	Matthew Brown	Vektor Consultants	(347) 871-0750
Client Contact	Josh Veiner	261 Grand Concourse LLC	(718) 977-5666
Project Manager	TBD	NYSDOH	TBD
Project Manager	TBD	NYSDEC	TBD
Emergency Response		FDNY	911
Spill Hotline		NYSDEC	(800) 457-7362

3.0 HAZARD ANALYSIS

This section describes the safety and health hazards associated with site work and the control measures selected to protect workers in compliance with *29 CFR 1910.120(b)(4)(ii)(A) and 29 CFR 1926.65(b)(4)(ii)(A)*. This is accomplished by creating a specific Job Hazard Analysis for each task and operation to be conducted at the Site.

The purpose of the Job Hazard Analysis is to identify and, to the extent practicable, quantify the health and safety hazards associated with each site task and operation, and to evaluate the risks of each hazard to workers. With this information, appropriate control methods are selected to eliminate the identified risks if possible, or to effectively control them. The control methods are documented in each task-specific Job Hazard Analysis.

Job Hazard Analyses contained in this HASP have been developed by Vektor Consultants, the Site Health and Safety Supervisor. The Site Supervisor is the individual responsible for reviewing and "verifying" that all Job Hazard Analyses are complete and to ensure that ongoing hazard analyses are conducted at this site.

3.1 Hazard Notification Process

The information in the Job Hazard Analysis Worksheets, Hazardous Substance Profiles, and Safety Data Sheets (SDS) is made available to all employees who could be affected in the scope of their work at the Site. This shall be done prior to beginning work activities.

New, or modifications to existing, Job Hazard Analysis Worksheets, Hazardous Substance Profiles, or SDS are communicated during routine briefings.

Consistent with *29 CFR 1910.120(i) and 29 CFR 1926.65(i)*, this information will also be made available to contractors and subcontractors.

The Site Supervisor is the person responsible for providing Site information, this HASP, and any modifications to this HASP to contractors and/or subcontractors working on this Site.

3.2 Phases, Site Tasks and Hazard Analysis

This HASP applies to the Remedial Investigation (RI) phase at the Site. This HASP will apply to the following Tasks and/or Operations that will be accomplished during the RI:

- Geophysical survey
- Drilling (installation of soil borings, monitoring wells, and soil vapor points)
- Test pits, if necessary
- Decontamination
- Inspection
- Sampling (soil, groundwater, soil vapor, air, investigative derived waste)
- Monitoring well survey

3.3 Chemical Hazards

Exposure to chemical hazards should always be avoided. When working around chemical hazards it is important to be protected by administrative and/or engineered controls or, if administrative and/or engineered controls are not practicable or fully protective, by use of proper personal protective equipment (PPE). A direct reading instrument must be used, as necessary, to establish potential worker exposure.

Below is a list of chemical hazards that may be encountered on this site.

Chemical Name	OSHA PEL (ppm)	OSHA PEL (mg/m^3)	NIOSH REL (ppm)	NIOSH REL (mg/m^3)	IDLH (ppm)	IDLH (mg/m^3)
Polycyclic Aromatic Hydrocarbons (PAHs)		5		0.5		50

OSHA PEL. OSHA sets permissible exposure limits (PELs) to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. They may also contain a skin designation. PELs are enforceable. OSHA PELs are based on an 8-hour time weighted average (TWA) exposure.

IDLH. Immediately dangerous to life or health (IDLH) is a regulatory value defined as the maximum exposure concentration in the workplace from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects. This value should be referred to in respirator selection.

More specific chemical information is available in the Hazardous Substance Profiles included in Attachment 1 of this HASP. The Hazardous Substance Profiles are designed to assist with "chemical guidelines" in which further information may be needed, including but not limited to an SDS. This information is not intended to replace an SDS, rather to augment one.

3.4 Physical Hazards

Below is a list of physical hazards that may be encountered during RI activities at this Site. Personal awareness, strict adherence to all safety requirements, and the use of proper PPE when applicable will help keep this work site safe.

- Hand Tool Use
- Heavy Manual Lifting/Moving
- Material Handling
- Noise (Sound Pressure Level), dBA
- Sharp Objects
- Slips/Trips/Falls
- Traffic - On or Near Site

- Utilities (electrical, gas, water, etc.) – Overhead
- Utilities (electrical, gas, water, etc.) – Underground

3.5 Biological Hazards

Below is a list of biological hazards that may be encountered during RI activities at this Site. Personal awareness, strict adherence to all safety requirements, and the use of proper PPE when applicable will help keep this work site safe.

- Semi-volatile Organic Compounds (related to historical fill)

3.6 Radiological Hazards

Job hazard analysis indicates that workers are not expected to encounter radiological hazards at this Site for the phases, tasks and/or operations and work locations covered by this HASP.

3.7 Job Hazard Analysis Worksheets

The site-specific Job Hazard Analysis Worksheet is included in Attachment 2. A single Job Hazard Analysis Worksheet may be used for multiple locations provided that the task or operation, and hazards and control measures, are the same in each location.

The Job Hazard Analysis Worksheet lists the following information:

- Phase description
- Specific task or operation
- Specific location for task or operation
- Hazard analysis date(s) of task or operation
- Task or operation date(s)
- Person responsible for developing Job Hazard Analysis
- Person responsible for reviewing the Job Hazard Analysis
- Chemical, physical, biological and radiological hazards for each task or operation
- Specific control measures for each task or operation
- Required permit(s), if any

The Job Hazard Analysis Worksheet should be kept updated as information changes and previous copies should be retained.

3.0 TRAINING PROGRAM

The Site Safety and Health Training Program is designed to provide workers with the training necessary to work safely on this Site in compliance with *29 CFR 1910.120(b)(4)(ii)(B) and 29 CFR 1926.65(b)(4)(ii)(B)*. Training requirements for this site are based on the Job Hazard Analysis, contained in Attachment 2 of this HASP, and relevant OSHA requirements. Employees who have not been trained to a level required by their job function and responsibility are not permitted to participate in or supervise field activities.

3.1 Initial HazWoper Training

Initial training requirements for field personnel are based on the personnel's potential for exposure and compliance with the requirements of *29 CFR 1910.120(e)(3) and 29 CFR 1926.65(e)(3)*.

General Site Workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities that expose, or potentially expose, them to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off site, and a minimum of three days of actual field experience under direct supervision of a trained, experienced supervisor as per *29 CFR 1910.120(e)(3)(i) and 29 CFR 1926.65(e)(3)(i)*.

Specific Limited Task Workers on site only occasionally for a specific limited task (such as, but not limited to, field sampling, land surveying, geophysical surveying, or drilling) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off site, and a minimum of one day of actual field experience under direct supervision of a trained, experienced supervisor as per *29 CFR 1910.120(e)(3)(ii) and 29 CFR 1926.65(e)(3)(ii)*.

3.2 Site-Specific Training

In addition to the initial HAZWOPER training requirements outlined above, site personnel shall be trained on the following site-specific elements:

- Names of personnel and alternates responsible for site safety and health
- Health, safety, and other hazards present
- Use of specific personal protective equipment (PPE) detailed in this HASP
- Standard work practices by which the personnel can minimize risks from the hazards detailed in this HASP
- Safe use of administrative and/or engineering controls and equipment detailed in this HASP
- Medical surveillance requirements detailed in this HASP
- Decontamination procedures detailed in this HASP
- The emergency response plan detailed in this HASP

- Heat and cold stress prevention
- Working safely around heavy equipment

3.3 Site Briefings

A site-specific briefing shall be provided to visitors who enter this Site beyond the designated entry point. For visitors, the site-specific briefing shall include information about site hazards, the site layout including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements, as appropriate.

4.0 MEDICAL SURVEILLANCE PROGRAM

The Medical Surveillance Program is designed to medically monitor worker health to ensure that personnel are not adversely affected by site hazards in compliance with *29 CFR 1910.120(b)(4)(ii)(D) and 29 CFR 1926.65(b)(4)(ii)(D)*.

Medical surveillance is not required at this site due to:

- There is NO potential for worker exposure to hazardous substances at levels above OSHA permissible exposure limits or other published limits for 30 days or more per year, without regard to use of respiratory protection.
- Personnel DO NOT wear a respirator for 30 days or more a year or as required by *29 CFR 1910.134 and 29 CFR 1926.103*.

Any worker who is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substances or health hazards on this Site shall receive a medical examination as soon as possible after the occurrence, with follow-up examinations provided as required by the attending physician. Physical Exams shall be consistent with *29 CFR 1910.120(f) and 29 CFR 1926.65(f)*.

5.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) will be used at this Site to protect employees from biological, chemical and physical hazards in compliance with *29 CFR 1910.120(b)(4)(ii)(C) and 29 CFR 1926.65(b)(4)(ii)(C)*. This includes hazards associated with, but not limited to, remedial investigation activities.

With employee safety being the number one priority, site health hazards will be eliminated or reduced to the greatest extent possible through administrative and/or engineering controls and safe work practices. Where hazards are still present, a combination of administrative and/or engineering controls, work practices, and PPE will be used to protect employees.

The Site Supervisor and/or Health and Safety Supervisor are responsible for PPE use on this Site.

5.1 PPE Selection Criteria

PPE shall be selected and used to protect site workers from the hazards and potential hazards they are likely to encounter, as identified during the site characterization and Job Hazard Analysis (see Attachment 2). A PPE ensemble shall be assigned to each work task or operation.

PPE selection shall be based upon many factors. Materials providing the greatest duration of protection shall be used. Tear and seam strength of the PPE shall also be considered to ensure ensemble durability while work is performed.

When necessary, multiple layers of protection shall be used to accommodate the range of hazards that may be encountered. All PPE shall be properly fitted.

PPE selection criteria shall also include:

- Level of PPE required (Level A, B, C, or D)
- PPE components
- Chemical suit and glove compatibility

All PPE ensembles shall be consistent with Appendix B of *29 CFR 1910.120 and 29 CFR 1926.65* and used in accordance with manufacturers' recommendations.

The following criteria were used to select PPE levels at this Site:

<u>Level D Protection was selected due to the following:</u>

- The atmosphere contains no known or suspected hazardous substances at concentrations that meet or exceed the published exposure limits

- Contact with hazardous levels of any chemicals through splashes, immersion, or by other means will not occur
- There is no potential for unexpected inhalation or contact with hazardous levels of any chemical

Training In Use of PPE

Employees receive general training regarding proper selection, use and inspection of PPE during initial HAZWOPER training and subsequent refresher training. Site-specific PPE requirements, including task-specific PPE, ensemble components, cartridge and canister service times, and inspection and maintenance procedures, as applicable, shall be communicated as identified in the Training Program.

Because chemical exposure levels present do not create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape, positive pressure self-contained breathing apparatus or positive-pressure air-line respirators equipped with an escape air supply are not required.

6.0 ENVIRONMENTAL MONITORING

This section of the HASP describes how site worker exposures to hazardous substances will be monitored in compliance with *29 CFR 1910.120(b)(4)(ii)(E) and 29 CFR 1926.65(b)(4)(ii)(E)*.

6.1 Air Monitoring Procedures

Exposures to airborne hazardous substances shall be fully characterized throughout site operations to ensure that exposure controls are effectively selected and modified as needed. Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards to determine the appropriate level of site worker protection needed on site. Air monitoring procedures shall be consistent with OSHA requirements in *29 CFR 1910.120(c)(6) and 29 CFR 1926.65(c)(6)*.

Air monitoring shall be conducted using direct-reading instruments. Air monitoring includes:

- Initial monitoring prior to the beginning of remedial investigation activities to identify conditions that may cause death or serious harm and to permit preliminary selection of site controls
- Periodic monitoring throughout remedial investigation

6.2 Initial Monitoring Procedures

Upon initial entry, representative air monitoring shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits, or other dangerous condition such as the presence of flammable atmospheres or oxygen-deficient environments.

6.3 Periodic Monitoring

Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed, or when there is indication that exposure may have risen over permissible exposure limits or published exposure levels since previous monitoring was conducted. Situations where it shall be considered that the possibility exposures have risen are as follows:

- When work begins on a portion of the Site that has not been previously monitored
- When contaminants other than those previously identified are being handled
- When a change in environmental conditions exist
- When site workers handle leaking drums or containers, or work in areas with obvious liquid contamination

- When site workers report or exhibit signs of exposure

6.4 Direct-Reading Instrument Monitoring Procedures

Direct-reading instrument monitoring will be used on this site as follows:

- VOCs by photoionization detector (PID)

Monitoring equipment calibration and maintenance procedures on this site are:

- Every morning

7.0 DECONTAMINATION

This HASP element describes procedures for decontaminating site workers and equipment when exiting the Exclusion Zone in compliance with *29 CFR 1910.120(b)(4)(ii)(G) and 29 CFR 1926.65(b)(4)(ii)(G)*. This section also describes disposal of waste from decontamination processes. Site decontamination procedures are designed to achieve a safe, logical removal or neutralization of contaminants that may accumulate on site workers and/or equipment. The Site Supervisor is responsible for decontamination procedures at this site.

These procedures are intended to minimize site worker contact with contaminants and protect against the transfer of contamination to clean areas of the site and away from the site. They may also extend the useful life of personal protective equipment (PPE) by reducing the amount of time that contaminants contact and permeate or otherwise affect the surfaces of PPE.

Decontamination procedures shall be communicated to site workers and implemented before any site workers or equipment are permitted to enter areas on site where potential for exposure to hazardous substances exists.

Emergency decontamination procedures are detailed in Section 8, the Emergency Response Plan of this HASP.

The decontamination procedures described below are designed to meet the requirements of *29 CFR 1910.120(k) and 29 CFR 1926.65(k)* and include site-specific information about:

- General and Specific Decontamination Procedures for Personnel and PPE
- General and Specific Decontamination Procedures for Equipment
- Location and Type of Site Decontamination Procedures
- Disposal of Residual Waste from Decontamination
- Monitoring the Effectiveness of Decontamination Procedures

7.1 General and Specific Decontamination Procedures for Site Workers and PPE

All site workers and PPE leaving a contaminated area shall be appropriately decontaminated. General decontamination guidelines for site workers and PPE include:

- Decontamination is required for all site workers exiting a contaminated area. Site workers may only re-enter uncontaminated areas after undergoing the decontamination procedures described in the next section.
- Protective clothing is decontaminated, cleaned, laundered, maintained and/or replaced as needed to ensure its effectiveness.
- PPE used at this site is decontaminated or prepared for proper disposal.

- The site requires and trains site workers that if their permeable clothing is splashed or becomes wetted with a hazardous substance, they will immediately exit the work zone, perform applicable decontamination procedures, shower, and change into uncontaminated clothing.

7.2 General and Specific Decontamination Procedures for Equipment

All contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated. General decontamination guidelines for equipment include:

- Decontamination is required for all equipment exiting a contaminated area. Equipment may only re-enter uncontaminated areas after undergoing specific decontamination as described in the Job Hazard Analysis Worksheets.
- Particular attention is given to decontaminating tires, scoops, and other parts of heavy equipment that are directly exposed to contaminants and contaminated soil.

7.3 Location and Type of Site Decontamination Procedures

Decontamination shall be performed in areas that will minimize the exposure of uncontaminated site workers or equipment to contaminated site workers or equipment. Decontamination on this site shall be conducted in the Contamination Reduction Zone. The Contamination Reduction Zone acts as a buffer between the Exclusion Zone and Support Zone. The location and design of decontamination stations minimize the spread of contamination beyond these stations.

7.4 Disposal of Waste from Decontamination

Procedures for disposal of decontamination waste shall meet applicable local, State, and Federal regulations.

7.5 Monitoring the Effectiveness of Decontamination Procedures

Decontamination procedures shall be monitored by a representative of Vektor Consultants, the Site Health and Safety Supervisor, to determine effectiveness. If procedures are found to be deficient, appropriate steps shall be taken to correct any deficiencies.

8.0 EMERGENCY RESPONSE PLAN

This section describes the site-specific Emergency Response Plan in compliance with *29 CFR 1910.120(b)(4)(ii)(H) and 29 CFR 1926.65(b)(4)(ii)(H)*. Specifically, the Emergency Response Plan addresses potential emergencies at this site, procedures for responding to these emergencies, roles and responsibilities during emergency response, and training. This element also describes the provisions this site has made to coordinate its emergency response planning with other contractors on site and with off-site emergency response organizations.

This Emergency Response Plan shall be available for inspection and copying by site workers, their representatives, OSHA personnel, and other governmental agencies with relevant responsibilities as required by *29 CFR 1910.120(l)(1)(i) and 29 CFR 1926.65(l)(1)(i)*.

In accordance with *29 CFR 1910.120(l)(3)(ii) and 29 CFR 1926.65(l)(3)(ii)*, this Emergency Response Plan is a separate section of the HASP.

8.1 Pre-Emergency Planning

This Emergency Response Plan is compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

This Site has been evaluated for potential emergency occurrences based on site hazards, the tasks within the work plan, the site topography, and prevailing weather conditions.

8.2 Personnel Roles, Lines of Authority, and Communication

Anyone may activate the Emergency Response Plan; however, Matthew Brown (or designated alternate), Site Health and Safety Supervisor, is responsible for implementing the Emergency Response Plan and coordinating emergency response activities on this Site. Matthew Brown (or designated alternate) also provides specific direction for emergency action based upon information available regarding the incident and response capabilities, initiates emergency procedures including protection of the public, and ensures appropriate authorities are notified.

In accordance with *29 CFR 1910.38(a) and 29 CFR 1926.35*, in the event of an emergency, site workers are evacuated and do not participate in emergency response activities.

This Site relies upon the off-site emergency response organizations listed in the Emergency Response Contact Information list to respond to site emergencies. These organizations are appropriately trained, staffed, and equipped to provide emergency response to this site.

These organizations are contacted at least annually to verify the accuracy of phone numbers and contact names.

Communication on this site will be conducted by the following methods:

- Face to face
- Cell phone
- Hand signals

8.3 Site Security and Control

In case of an on-site emergency, site security and control for this site shall be provided by:

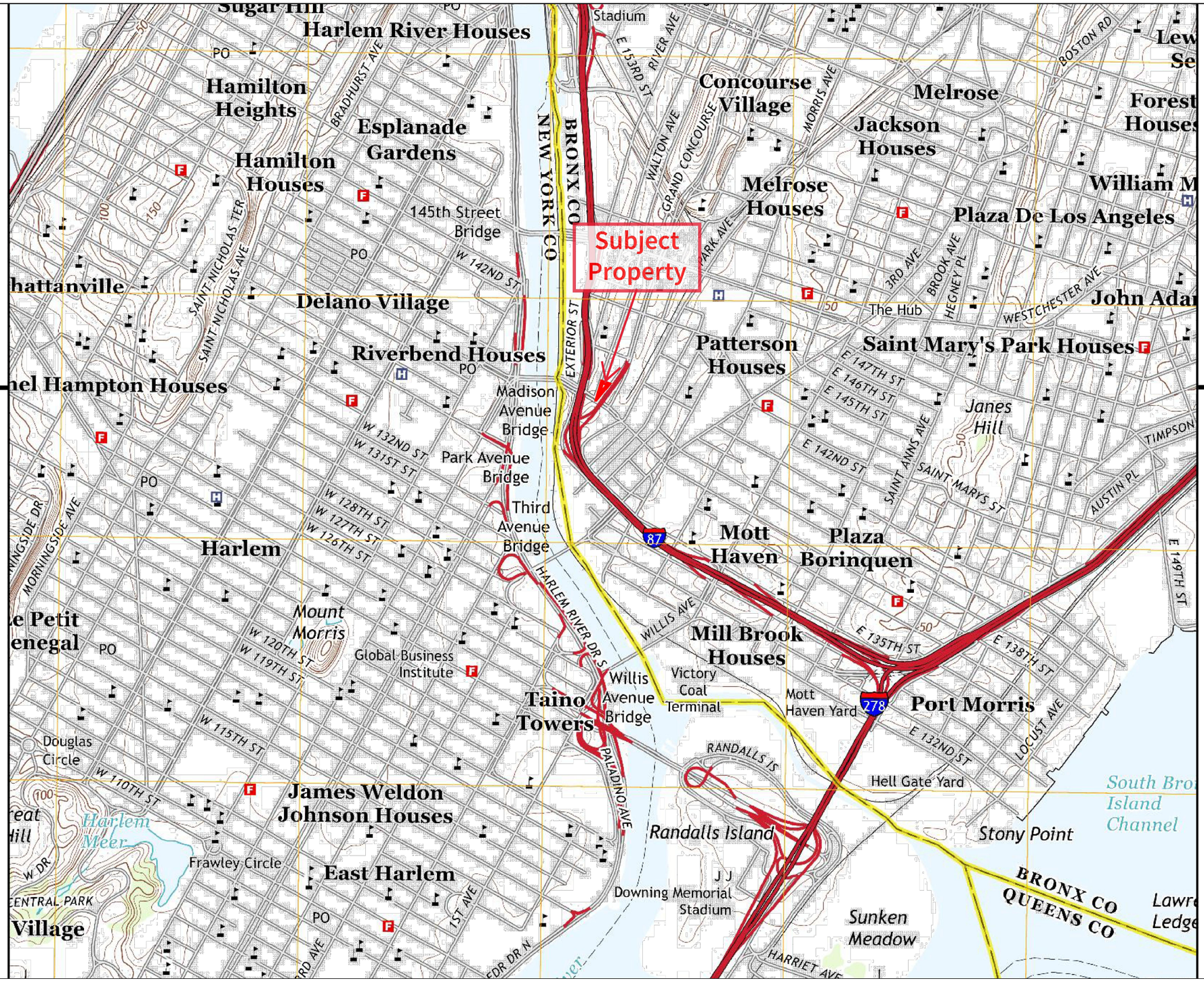
- Warning Signs
- Barrier Tape
- Locked Doors and Gates

8.4 Emergency Medical Treatment and First Aid

Any site worker who requires medical care and/or is transferred to a medical facility shall be accompanied by Hazardous Substance Profiles included in Attachment 1 of this HASP and other applicable information to apprise caregivers of the chemicals and hazards to which the victim has potentially been exposed. The emergency medical care facility for this site is:

Lincoln Medical Center
234 East 149th Street, Bronx, New York
Tel: (718) 579-5000
Open 24 Hours

The route to the facility is shown in on the map included in Attachment 3 of this HASP.



vEKtor consultants

t: +1.347.871.0750
f: +1.347.402.7735
e: info@vektorconsultants.com
www.vektorconsultants.com

Legend:

Approximate Site Location

Base Map provided by Environmental Data Resources - United Geological Survey 7.5 Minute Series Central Park Quadrangle 2013

Scale:	
Figure No.	1
Figure Name:	Site Location Map
Report:	HASP
Date:	09/07/21
Drawn By:	EK
Site Address:	261 Grand Concourse Bronx, New York

Attachment 1

Hazardous Substance Profiles and/or SDS

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1996**

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl′ĭ-sī′klĭk ăr′ə-măt′ĭk hī′drə-kar′bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.

- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Finding a measurable amount of one or more PAH metabolites in the urine does not mean that the levels of one or more PAH metabolites or PAHs cause an adverse health effect. Biomonitoring studies on levels of PAH metabolites provide physicians and public health officials with reference values so that they can determine whether people have been exposed to higher levels of these chemicals than are found in the general population. Biomonitoring data can also help scientists plan and conduct research on exposure and health effects.

For More Information

- Agency for Toxic Substances and Disease Registry
  ToxFAQs for Polycyclic Aromatic Hydrocarbons (PAHs)
  http://www.atsdr.cdc.gov/tfacts69.html

- Environmental Protection Agency
  Consumer Factsheet on: BENZO(A)PYRENE
  http://www.epa.gov/ogwdw000/contaminants/dw_contamfs/benzopyr.html

- United States Geological Survey
  Definition Page for Polynuclear Aromatic Hydrocarbons
  http://toxics.usgs.gov/definitions/pah.html

November 2009

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.

Material Safety Data Sheet
PAH Contaminated Soil

ACC# 17974

Section 1 - Chemical Product and Company Identification

MSDS Name: PAH Contaminated Soil
Catalog Numbers: SRS103100
Synonyms: API separator sludge
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
Not available	Soil	78-99	unlisted
120-12-7	Anthracene	0-2	204-371-1
129-00-0	Pyrene	0-2	204-927-3
132-64-9	Dibenzofuran	0-2	205-071-3
205-99-2	Benzo(b)fluoranthene	0-2	205-911-9
206-44-0	Fluoranthene	0-2	205-912-4
208-96-8	Acenaphthylene	0-2	205-917-1
218-01-9	1,2-benzphenanthrene	0-2	205-923-4
50-32-8	Benzo(a)pyrene	0-2	200-028-5
56-55-3	1,2-Benzanthracene	0-2	200-280-6
83-32-9	Acenaphthene	0-2	201-469-6
85-01-8	Phenanthrene	0-2	201-581-5
86-73-7	Fluorene	0-2	201-695-5
87-86-5	Pentachlorophenol	0-2	201-778-6
91-20-3	Naphthalene	0-2	202-049-5
91-57-6	2-methylnaphthalene	0-2	202-078-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: not available solid.
Warning! May cause allergic skin reaction. Causes eye and skin irritation. May cause cancer based on animal studies.

Target Organs: Eyes, skin.

Potential Health Effects

Eye: May cause eye irritation.
Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Naphthalene can cause cataracts, optical neuritis, and cornea injuries. Ingestion of large quantities may cause severe hemolytic anemia and
Inhalation: Causes respiratory tract irritation. May cause effects similar to those described for ingestion.
Chronic: May cause cancer according to animal studies. Prolonged exposure to respirable crystalline quartz may cause delayed lung injury/fibrosis (silicosis).

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Avoid generating dusty conditions. Use with adequate ventilation. Avoid contact with skin and

eyes. Keep container tightly closed. Avoid ingestion and inhalation.
Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Soil	none listed	none listed	none listed
Anthracene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches).
Pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches).
Dibenzofuran	none listed	none listed	none listed
Benzo(b)fluoranthene	none listed	none listed	none listed
Fluoranthene	none listed	none listed	none listed
Acenaphthylene	none listed	none listed	none listed
1,2-benzphenanthrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches).
Benzo(a)pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches).
1,2-Benzanthracene	none listed	none listed	none listed
Acenaphthene	none listed	none listed	none listed
Phenanthrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches).
Fluorene	none listed	none listed	none listed
Pentachlorophenol	0.5 mg/m3 TWA; Skin - potential significant contribution to overall exposure by the cutaneous r oute	0.5 mg/m3 TWA 2.5 mg/m3 IDLH	0.5 mg/m3 TWA
	10 ppm TWA; 15 ppm STEL; Skin - potential	10 ppm TWA; 50 mg/m3	10 ppm TWA; 50 mg/m3

Naphthalene	significant contribution to overall exposure by the cutaneous r oute	TWA 250 ppm IDLH	TWA
2-methylnaphthalene	0.5 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous r oute	none listed	none listed

OSHA Vacated PELs: Soil: No OSHA Vacated PELs are listed for this chemical. Anthracene: No OSHA Vacated PELs are listed for this chemical. Pyrene: No OSHA Vacated PELs are listed for this chemical. Dibenzofuran: No OSHA Vacated PELs are listed for this chemical. Benzo(b)fluoranthene: No OSHA Vacated PELs are listed for this chemical. Fluoranthene: No OSHA Vacated PELs are listed for this chemical. Acenaphthylene: No OSHA Vacated PELs are listed for this chemical. 1,2-benzphenanthrene: No OSHA Vacated PELs are listed for this chemical. Benzo(a)pyrene: No OSHA Vacated PELs are listed for this chemical. 1,2-Benzanthracene: No OSHA Vacated PELs are listed for this chemical. Acenaphthene: No OSHA Vacated PELs are listed for this chemical. Phenanthrene: No OSHA Vacated PELs are listed for this chemical. Fluorene: No OSHA Vacated PELs are listed for this chemical. Pentachlorophenol: 0.5 mg/m3 TWA Naphthalene: 10 ppm TWA; 50 mg/m3 TWA 2-methylnaphthalene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: not available
Odor: none reported
pH: Not available.
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: Mixture
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures.
Incompatibilities with Other Materials: None reported.

Hazardous Decomposition Products: No data available.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 120-12-7: CA9350000
CAS# 129-00-0: UR2450000; UR2450100
CAS# 132-64-9: HP4430000
CAS# 205-99-2: CU1400000
CAS# 206-44-0: LL4025000
CAS# 208-96-8: AB1254000; AB1254200
CAS# 218-01-9: GC0700000
CAS# 50-32-8: DJ3675000
CAS# 56-55-3: CV9275000
CAS# 83-32-9: AB1000000
CAS# 85-01-8: SF7175000
CAS# 86-73-7: LL5670000
CAS# 87-86-5: SM6300000; SM6314000; SM6321000
CAS# 91-20-3: QJ0525000
CAS# 91-57-6: QJ9635000
LD50/LC50:
CAS# 120-12-7:
Oral, mouse: LD50 = 4900 mg/kg;
.

CAS# 129-00-0:
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = 170 mg/m3;
Inhalation, rat: LC50 = 170 mg/m3;
Oral, mouse: LD50 = 800 mg/kg;
Oral, rat: LD50 = 2700 mg/kg;
.

CAS# 132-64-9:
.

CAS# 205-99-2:
.

CAS# 206-44-0:
Oral, rat: LD50 = 2 gm/kg;
Skin, rabbit: LD50 = 3180 mg/kg;
.

CAS# 208-96-8:
Oral, mouse: LD50 = 1760 mg/kg;
.

CAS# 218-01-9:
.

CAS# 50-32-8:
.

CAS# 56-55-3:
.

CAS# 83-32-9:
.

CAS# 85-01-8:
Oral, mouse: LD50 = 700 mg/kg;
Oral, rat: LD50 = 1.8 gm/kg;
.

CAS# 86-73-7:
.

CAS# 87-86-5:
Draize test, rabbit, eye: 100 uL/24H Mild;
Inhalation, mouse: LC50 = 225 mg/m3;
Inhalation, mouse: LC50 = 225 mg/m3;
Inhalation, rat: LC50 = 355 mg/m3;
Inhalation, rat: LC50 = 200 mg/m3;
Inhalation, rat: LC50 = 335 mg/m3;
Oral, mouse: LD50 = 36 mg/kg;
Oral, mouse: LD50 = 117 mg/kg;
Oral, mouse: LD50 = 30 mg/kg;
Oral, rabbit: LD50 = 200 mg/kg;
Oral, rat: LD50 = 27 mg/kg;
Oral, rat: LD50 = 27 mg/kg;
Oral, rat: LD50 = 50 mg/kg;
Skin, rat: LD50 = 96
CAS# 91-20-3:
Draize test, rabbit, eye: 100 mg Mild;
Inhalation, rat: LC50 = >340 mg/m3/1H;
Oral, mouse: LD50 = 316 mg/kg;
Oral, rat: LD50 = 490 mg/kg;
Skin, rabbit: LD50 = >20 gm/kg;
Skin, rat: LD50 = >2500 mg/kg;
.

CAS# 91-57-6:
Oral, rat: LD50 = 1630 mg/kg;
.

Carcinogenicity:
CAS# 120-12-7:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Coal tar pitches').
- **California:** Not listed.
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 129-00-0:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Coal tar pitches').
- **California:** Not listed.
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 132-64-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 205-99-2:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

CAS# 206-44-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 208-96-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 218-01-9:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 50-32-8:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen

CAS# 56-55-3:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

CAS# 83-32-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 85-01-8:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Coal tar pitches').
- **California:** Not listed.
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

CAS# 86-73-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 87-86-5:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

CAS# 91-20-3:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 4/19/02
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

CAS# 91-57-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.

Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 206-44-0: waste number U120.
CAS# 218-01-9: waste number U050.
CAS# 50-32-8: waste number U022.
CAS# 56-55-3: waste number U018.
CAS# 91-20-3: waste

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

Soil is not listed on the TSCA inventory. It is for research and development use only.
CAS# 120-12-7 is listed on the TSCA inventory.
CAS# 129-00-0 is listed on the TSCA inventory.
CAS# 132-64-9 is listed on the TSCA inventory.
CAS# 205-99-2 is not listed on the TSCA inventory. It is for research and development use only.
CAS# 206-44-0 is listed on the TSCA inventory.
CAS# 208-96-8 is listed on the TSCA inventory.
CAS# 218-01-9 is listed on the TSCA inventory.
CAS# 50-32-8 is listed on the TSCA inventory.
CAS# 56-55-3 is listed on the TSCA inventory.
CAS# 83-32-9 is listed on the TSCA inventory.
CAS# 85-01-8 is listed on the TSCA inventory.
CAS# 86-73-7 is listed on the TSCA inventory.

CAS# 87-86-5 is listed on the TSCA inventory.
CAS# 91-20-3 is listed on the TSCA inventory.
CAS# 91-57-6 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 129-00-0: Effective 6/1/87, Sunset 6/1/97 CAS# 91-20-3: Effective 6/1/87, Sunset 6/1/97

Chemical Test Rules

CAS# 91-20-3: 40 CFR 799.5115

Section 12b

CAS# 91-20-3: Section 4, 0.1 % de minimus concentration

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 120-12-7: 5000 lb final RQ; 2270 kg final RQ CAS# 129-00-0: 5000 lb final RQ; 2270 kg final RQ CAS# 132-64-9: 100 lb final RQ; 45.4 kg final RQ CAS# 205-99-2: 1 lb final RQ; 0.454 kg final RQ CAS# 206-44-0: 100 lb final RQ; 45.4 kg final RQ CAS# 208-96-8: 5000 lb final RQ; 2270 kg final RQ CAS# 218-01-9: 100 lb final RQ; 45.4 kg final RQ CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ CAS# 56-55-3: 10 lb final RQ; 4.54 kg final RQ CAS# 83-32-9: 100 lb final RQ; 45.4 kg final RQ CAS# 85-01-8: 5000 lb final RQ; 2270 kg final RQ CAS# 86-73-7: 5000 lb final RQ; 2270 kg final RQ CAS# 87-86-5: 10 lb final RQ; 4.54 kg final RQ CAS# 91-20-3: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 129-00-0: 1000 lb lower threshold TPQ; 10000 lb upper threshold T PQ

SARA Codes

CAS # 120-12-7: immediate.
CAS # 129-00-0: immediate, delayed.
CAS # 206-44-0: immediate.
CAS # 50-32-8: immediate, delayed.
CAS # 56-55-3: delayed.
CAS # 83-32-9: immediate.
CAS # 85-01-8: immediate.
CAS # 91-20-3: immediate, delayed, fire.
CAS # 91-57-6: immediate.

Section 313

This material contains Anthracene (CAS# 120-12-7, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Dibenzofuran (CAS# 132-64-9, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Benzo(b)fluoranthene (CAS# 205-99-2, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Fluoranthene (CAS# 206-44-0, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains 1,2-benzphenanthrene (CAS# 218-01-9, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Benzo(a)pyrene (CAS# 50-32-8, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains 1,2-Benzanthracene (CAS# 56-55-3, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Phenanthrene (CAS# 85-01-8, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Pentachlorophenol (CAS# 87-86-5, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Naphthalene (CAS# 91-20-3, 0-2%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 132-64-9 is listed as a hazardous air pollutant (HAP).

CAS# 87-86-5 is listed as a hazardous air pollutant (HAP).
CAS# 91-20-3 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 87-86-5 is listed as a Hazardous Substance under the CWA. CAS# 91-20-3 is listed as a Hazardous Substance under the CWA. CAS# 120-12-7 is listed as a Priority Pollutant under the Clean Water Act. CAS# 129-00-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 205-99-2 is listed as a Priority Pollutant under the Clean Water Act. CAS# 206-44-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 208-96-8 is listed as a Priority Pollutant under the Clean Water Act. CAS# 218-01-9 is listed as a Priority Pollutant under the Clean Water Act. CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act. CAS# 56-55-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 83-32-9 is listed as a Priority Pollutant under the Clean Water Act. CAS# 85-01-8 is listed as a Priority Pollutant under the Clean Water Act.

CAS# 86-73-7 is listed as a Priority Pollutant under the Clean Water Act. CAS# 87-86-5 is listed as a Priority Pollutant under the Clean Water Act. CAS# 91-20-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 206-44-0 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 83-32-9 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 87-86-5 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 91-20-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 120-12-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Coal tar pitches), Massachusetts.

CAS# 129-00-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Coal tar pitches), Massachusetts.

CAS# 132-64-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

CAS# 205-99-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 206-44-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 208-96-8 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

CAS# 218-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 50-32-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 56-55-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 83-32-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 85-01-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Coal tar pitches), Massachusetts.

CAS# 86-73-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

CAS# 87-86-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 91-20-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 91-57-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

WARNING: This product contains Benzo(b)fluoranthene, a chemical known to the state of California to cause cancer. WARNING: This product contains 1,2-benzphenanthrene, a chemical known to the state of California to cause cancer. WARNING: This product contains Benzo(a)pyrene, a chemical known to the state of California to cause cancer. WARNING: This product contains 1,2-Benzanthracene, a chemical known to the state of California to cause cancer. WARNING: This product contains Pentachlorophenol, a chemical known to the state of California to cause cancer. WARNING: This product contains Naphthalene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 205-99-2: 0.096 æg/day NSRL (oral) CAS# 218-01-9: 0.35 æg/day NSRL (oral) CAS# 50-32-8: 0.06 æg/day NSRL CAS# 56-55-3: 0.033 æg/day NSRL (oral) CAS# 87-86-5: 40 æg/day NSRL CAS# 91-20-3: 5.8 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 120-12-7: 2
CAS# 129-00-0: No information available.
CAS# 132-64-9: No information available.
CAS# 205-99-2: No information available.
CAS# 206-44-0: No information available.
CAS# 208-96-8: No information available.
CAS# 218-01-9: No information available.
CAS# 50-32-8: No information available.
CAS# 56-55-3: No information available.
CAS# 83-32-9: No information available.
CAS# 85-01-8: No information available.
CAS# 86-73-7: No information available.
CAS# 87-86-5: 3
CAS# 91-20-3: 2
CAS# 91-57-6: No information available.

Canada - DSL/NDSL

CAS# 120-12-7 is listed on Canada's DSL List.
CAS# 129-00-0 is listed on Canada's DSL List.
CAS# 132-64-9 is listed on Canada's DSL List.
CAS# 218-01-9 is listed on Canada's DSL List.
CAS# 50-32-8 is listed on Canada's DSL List.
CAS# 83-32-9 is listed on Canada's DSL List.
CAS# 85-01-8 is listed on Canada's DSL List.
CAS# 86-73-7 is listed on Canada's DSL List.
CAS# 87-86-5 is listed on Canada's DSL List.
CAS# 91-20-3 is listed on Canada's DSL List.
CAS# 91-57-6 is listed on Canada's DSL List.
CAS# 206-44-0 is listed on Canada's NDSL List.
CAS# 208-96-8 is listed on Canada's NDSL List.
CAS# 56-55-3 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 120-12-7 is listed on the Canadian Ingredient Disclosure List.
CAS# 129-00-0 is listed on the Canadian Ingredient Disclosure List.
CAS# 205-99-2 is listed on the Canadian Ingredient Disclosure List.
CAS# 206-44-0 is listed on the Canadian Ingredient Disclosure List.
CAS# 208-96-8 is not listed on the Canadian Ingredient Disclosure List.
CAS# 218-01-9 is listed on the Canadian Ingredient Disclosure List.
CAS# 50-32-8 is listed on the Canadian Ingredient Disclosure List.
CAS# 56-55-3 is listed on the Canadian Ingredient Disclosure List.
CAS# 83-32-9 is listed on the Canadian Ingredient Disclosure List.
CAS# 85-01-8 is listed on the Canadian Ingredient Disclosure List.
CAS# 86-73-7 is not listed on the Canadian Ingredient Disclosure List.
CAS# 87-86-5 is not listed on the Canadian Ingredient Disclosure List.
CAS# 91-20-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #5 Date: 11/20/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Attachment 2

Job Hazard Analysis Worksheets

JOB HAZARD ANALYSIS WORKSHEET			
Phase Description:	Remedial Investigation		
Task or Operation:	Mobilization, Geophysical Survey, Drilling, Sampling, Site Survey		
Specific Location:	Entire Site		
Task or Operation Start Date(s):	November 2021	**Task or Operation Duration:**	1-3 Months
Date of Hazard Analysis:	September 7, 2021		
Job Hazard Analysis Developed by:	EK		
Job Hazard Analysis Reviewed by:	EK		

POTENTIAL HAZARDS DURING THIS TASK and/or OPERATION			
Chemical*	**Physical**	**Biological**	**Radiological**
» PAHs	» Hand Tool Use » Heavy Manual Lifting/Moving » Material Handling » Noise (Sound Pressure Level), dBA » Sharp Objects » Slips/Trips/Falls » Traffic - On or Near Site » Utilities (electrical, gas, water, etc.) - Overhead » Utilities (electrical, gas, water, etc.) - Underground	» PAHs	» N/A

HAZARD CONTROL MEASURES USED DURING THIS TASK and/or OPERATION

Administrative Controls: Log In/Out Sheets

PPE Description:

Component	Description
Level A Ensemble	
Boots, chemical-resistant, steel toe and shank	
Gloves, inner, chemical-resistant	
Gloves, outer, chemical-resistant	
Supplied Air Respirator - air-line	
Totally-encapsulating vapor tight chemical protective suit	
Level B Ensemble	
Boots, chemical-resistant, steel toe and shank	
Disposable one-piece hooded chemical resistant splash clothing suit	
Gloves, inner, chemical-resistant	
Gloves, outer, chemical-resistant	

Supplied Air Respirator - air-line

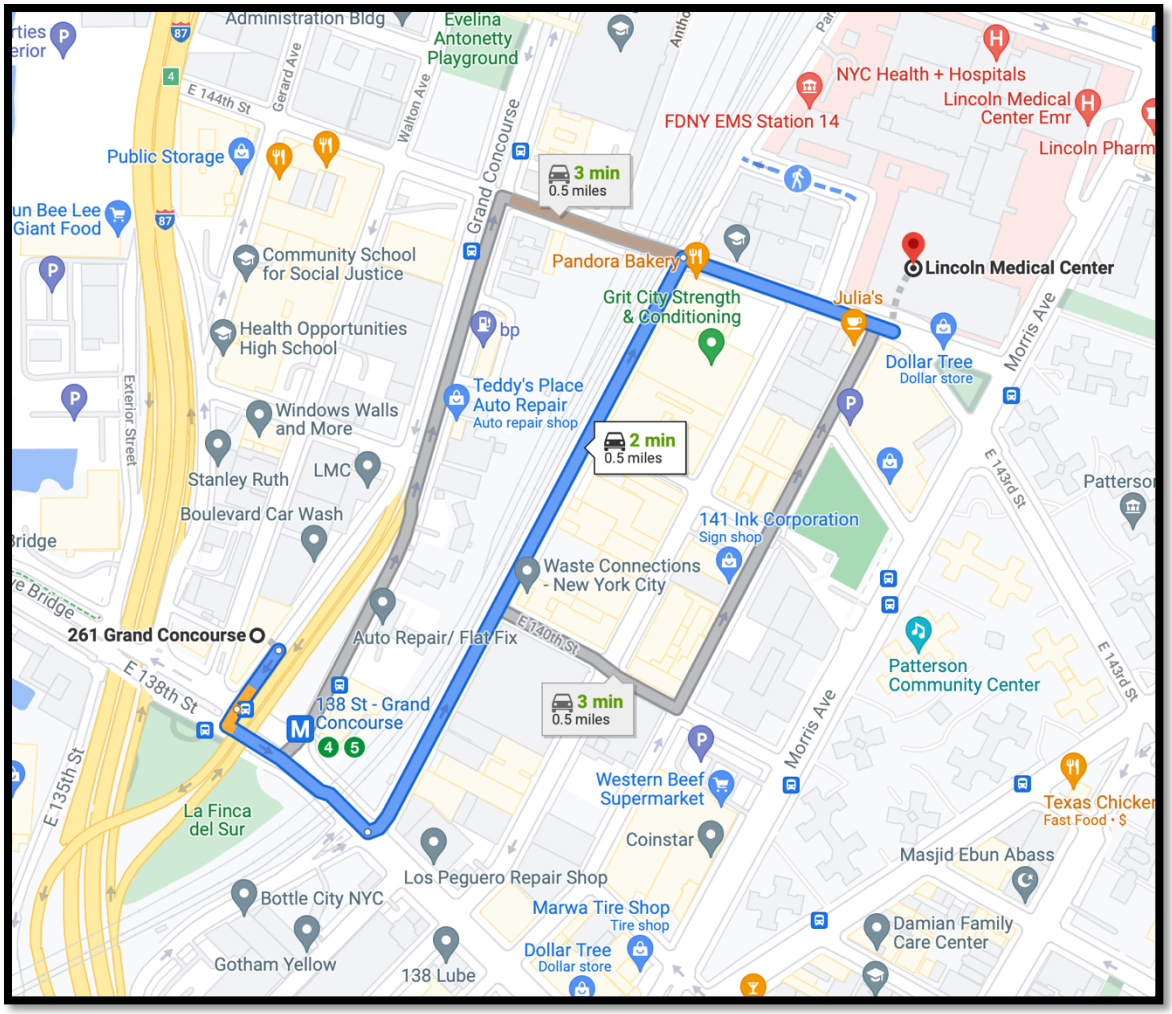
	Level C Ensemble
	Air purifying respirator - full face
	Boots, chemical-resistant, steel toe and shank
	Coveralls
	Disposable one-piece hooded chemical resistant splash clothing suit
	Escape Mask
	Gloves, inner, chemical-resistant
	Gloves, outer, chemical-resistant
	Level D Ensemble
	Dust Mask
	Escape Mask
	Gloves
Air-Purifying Respirator Cartridge/Canister Change Schedule:	
Decon Procedures for People & Equipment:	Alconox Tap Water Distilled Water
Required Permit(s):	N/A
Other Information:	

*Detailed Chemical Information is listed on attached Hazardous Substance Profiles and/or SDS

Attachment 3

Directions to Hospital

Directions to Hospital



261 Grand Concourse

Bronx, NY 10451

Head southwest on Grand Concourse toward E 138th St

164 ft

Turn left at the 1st cross street onto E 138th St

446 ft

Turn left onto Park Ave

0.3 mi

Turn right onto E 144th St

Destination will be on the left

0.1 mi

Lincoln Medical Center

234 E 149th St, Bronx, NY 10451

APPENDIX D

COMMUNITY AIR MONITORING PLAN (CAMP)

vEKtor consultants

t: +1.347.871.0750 info@vektorconsultants.com
f: +1.347.402.7735 www.vektorconsultants.com

COMMUNITY AIR MONITORING PLAN

Prepared For: 261 Grand Concourse LLC

Project Name: Copyrite Plastic Sheets

Project Location: 261 Grand Concourse, Bronx, New York

Date: September 7, 2021

37 West 37th Street, 6th Floor, New York, NY 10018

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1.0 Introduction 2

2.0 Community Air Monitoring Plan 3

3.0 VOC Monitoring, Response Levels, and Actions 4

4.0 Particulate Monitoring, Response Levels, and Actions 5

Appendix A: Action Limit Report

1.0 INTRODUCTION

This site-specific Community Air Monitoring Plan (CAMP) has been prepared on behalf of 261 Grand Concourse LLC for the implementation of a remedial investigation (RI) by Vektor Consultants, LLC (Vektor) and its subcontractors at the property located at 261 Grand Concourse, Bronx, New York (the Site). The Site is identified by the City of New York as Borough of Bronx, Block 2344 and Lot 1.

This CAMP was developed in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan included within DER-10 Technical Guidance for Site Investigation and Remediation (May 2010). All instruments will be operated and calibrated as per the manufacturer's specifications.

A 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.

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

2.0 COMMUNITY AIR MONITORING PLAN

A limited subsurface investigation was conducted by Gallinger Environmental, Corp. (GEM) in November 2019 and the findings of their assessment was provided in a Limited Subsurface Investigation Report dated December 2019. Based on the results of this investigation, semi-volatile organic compounds (SVOCs) are the constituents of concern at the Site. Therefore, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary.

Continuous monitoring will be required for all ground intrusive activities. 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. APeriodic@ 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.

Meteorological monitoring including temperature, wind direction and speed will be conducted by the field personnel and the data will be logged in the field book on a daily basis. CAMP station(s) will be relocated based on the direction of the wind.

3.0 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.

- 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.
- 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.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
- All 15-minute readings must be recorded and be available for the NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

4.0 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 (i.e.: DustTrak). 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.

- 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.
- 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.
- All readings must be recorded and be available for the NYSDEC and NYSDOH personnel to review.

Dust suppression will be achieved by applying water as needed.

APPENDIX A

ACTION LIMIT REPORT

CAMP
ACTION LIMIT REPORT

Project Location: 261 Grand Concourse, Bronx, NY

Date: _____ Time: _____

Name: _____

Contaminant: _____ PM-10: _____ VOC: _____

Wind Speed: _____ Wind Direction: _____

Temperature: _____ Barometric Pressure: _____

DOWNWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

UPWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

BACKGROUND CORRECTED LEVELS

Monitor ID #: Location: _____ Level Reported: Level Reported: _____

ACTIONS TAKEN

_____
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