272 4TH AVENUE
KINGS COUNTY
BROOKLYN, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: C224298
AKRF Project Number: 190021

Prepared for:

Carroll Street Borrower LLC
272 4th Avenue LLC
274 4th and 538 Carroll LLC
497 Carroll Street, 6th Floor
Brooklyn, NY 11215

Prepared by:

akrf
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212-696-0670

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

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DECEMBER 2024

CERTIFICATION STATEMENT

I, Rebecca Kinal, P.E., certify that I am currently a New York State registered Professional Engineer as defined in 6 NYCRR Part 375 and that this Site Management Plan (SMP) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and green remediation (DER-31).

___Rebecca Kinal_____________ P.E.

___December 20, 2024________DATE

REBECCA A. KINAL
082046-1

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LIST OF ACRONYMS

Acronym	Definition
AST	Aboveground Storage Tank
AWQSGVs	Ambient Water Quality Standards and Guidance Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below Ground Surface
BTEX	A group of VOCs comprising benzene, toluene, ethylbenzene, and xylenes
C&D	Construction and Demolition
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
COC	Certificate of Completion
CP	Commissioner’s Policy
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
EDR	Environmental Data Resources
ELAP	Environmental Laboratory Approval Program
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
EWP	Excavation Work Plan
GPA	Gas Penetrating Aggregate
HASP	Health and Safety Plan
IA	Indoor Air
IC	Institutional Control
inH_2O	Inches of Water Column
ISCO	In-Situ Chemical Oxidation
MP	Monitoring Point
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTA	Metropolitan Transportation Authority
MW	Monitoring Well
NA	Not Applicable
NY	New York
NYC	New York City
NYCRR	New York Codes, Rules and Regulations
NYCT	New York City Transit Authority
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
ORC	Oxygen Release Compound®
OSHA	United States Occupational Safety and Health Administration
P.E.	Professional Engineer
P&ID	Process and Instrumentation Diagram
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl

Acronym	Definition
PCE	Tetrachloroethylene
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PGWSCO	Protection of Groundwater Soil Cleanup Objective
PID	Photoionization Detector
ppt	Parts per Trillion
PRR	Periodic Review Report
PVC	Polyvinyl Chloride
PWGSCO	Protection of Groundwater Soil Cleanup Objective
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIR	Remedial Investigation Report
RP	Remedial Party
RRGV	Restricted Residential Use Guidance Value
RRSCO	Restricted Residential Soil Cleanup Objective
RSO	Remedial Site Optimization
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objective
SI	Site Investigation
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SQG	Small Quantity Generator
SSDS	Sub-slab Depressurization System
SV	Soil Vapor
SVIE	Soil Vapor Intrusion Evaluation
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
TOGS	Technical Operational and Guidance Series
UST	Underground Storage Tank
UUGV	Unrestricted Use Guidance Value
UUSCO	Unrestricted Use Soil Cleanup Objective
VFD	Variable-frequency Drive
VMP	Vapor Monitoring Point
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

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

Site Identification:	BCP Site Identification No. C224298 272 4th Avenue a/k/a 544 Carroll Street 274 4th Avenue/538 Carroll Street, Brooklyn, New York
Institutional Controls (ICs):	1. The controlled property may be used for Restricted Residential use as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial use as described in 6 NYCRR Part 375-1.8(g)(2)(iii), and Industrial use as described in 6 NYCRR Part 375-1.8(g)(2)(iv).
	2. All ECs must be operated and maintained as specified in this SMP.
	3. All ECs must be inspected at a frequency and in a manner defined in this SMP.
	4. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
	5. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP.
	6. Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in this SMP.
	7. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
	8. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP.
	9. Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP.
	10. Access to the Site must be provided to agents, employees, or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.
Engineering Controls (ECs):	1. SSDS
	2. Site-wide Cover System
Inspections:	Frequency
1. Site Inspection	Annually
2. SSDS Inspection	Monthly during first quarter post-startup and quarterly thereafter.
Monitoring:	
1. SSDS Monitoring	Monthly during first quarter post-startup and quarterly thereafter

2. Groundwater Monitoring	Quarterly during the two years (8 quarters). Continuation and frequency thereafter to be determined based on consultation with NYSDEC.
Maintenance:	
1. SSDS Maintenance	Quarterly/As necessary
Reporting:	
1. Periodic Review Report (PRR)	First PRR 16 months after receipt of Certificate of Completion. Annually thereafter.
2. Quarterly Reports	Quarterly for first PRR cycle. Annually thereafter.

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the 15,115.68-square-foot property located at 272 4th Avenue in the Gowanus neighborhood of Brooklyn, New York (hereinafter referred to as the "Site"). The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP), Site No. C224298, which is administered by New York State Department of Environmental Conservation (NYSDEC or Department). The Site location is shown on **Figure 1**.

272 4th Avenue LLC entered into a Brownfield Cleanup Agreement (BCA) with the NYSDEC on November 6, 2019 (Index No. C224298-10-19) to remediate the property located at 272 4th Avenue [New York City (NYC) Tax Block 456, Lot 23]. The BCA was amended on March 30, 2022, to include the lots located at 274 4th Avenue and 538 Carroll Street (formerly NYC Tax Block 456, Lots 13 and 17, respectively). The BCA was amended again on April 17, 2024 to add Carroll Street Borrower, LLC as an additional Volunteer and as the new property owner and to merge the three lots that originally comprised the Site (former Lots 13, 17, and 23) into one lot current Lot 13). A figure showing the Site location and boundaries is provided as **Figure 2**. The boundaries of the Site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in **Appendix A**.

After completion of the remedial work, some contamination was left at the Site, which is hereafter referred to as "remaining contamination." Institutional and Engineering Controls (ICs and ECs) have been incorporated into the Site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC on July 8, 2024, and recorded with the Office of the City Register of the City of New York on July 18, 2024, as City Register File No. 2024000183575, requires compliance with this SMP and all ECs and ICs placed on the Site.

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

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC); and
- Failure to comply with this SMP is also a violation of ECL, 6 New York Codes, Rules, and Regulations (NYCRR) Part 375, and the NYSDEC BCA (Index No. C224298-10-19; BCP Site No. C224298) for the Site, and thereby subject to applicable penalties.

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

This SMP was prepared by AKRF, Inc. (AKRF), on behalf of 272 4th Avenue LLC, Carroll Street Borrower LLC, and 274 4th and 538 Carroll LLC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May

3, 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the Site. The responsibilities of the owner and remedial party are included as **Appendix C**.

1.2 Revisions and Alterations

Revisions and alterations to this plan will be proposed in writing to the NYSDEC's project manager. The NYSDEC can also make changes to the SMP or request revisions from the remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown of a mitigation system, post-remedial removal of contaminated sediment or soil, or other significant change to the Site conditions. All approved alterations must conform with Article 145 Section 7209 of the Education Law regarding the application of professional seals and alterations. For example, any changes to as-built drawings must be stamped by a New York State Professional Engineer (P.E.). In accordance with the Environmental Easement for the Site, the NYSDEC project manager will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

1.3 Notifications

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

1. 60-day advance notice of any proposed changes in Site use that are required under the terms of the BCA, 6 NYCRR Part 375, and/or ECL.
2. 7-day advance notice of any field activity associated with the remedial program.
3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (EWP). If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.
4. Notice within 48 hours of any damage or defect to the foundation, structures, or ECs that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
5. Notice within 48 hours of any non-routine maintenance activities.
6. Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake, that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
7. Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

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

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

Table I on the following page includes contact information for the above notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in **Appendix B**.

Table I
Notifications*

Name	**Contact Information**	**Required Notification****
Steven Wu NYSDEC Project Manager	(718) 482-6725 steven.wu@dec.ny.gov	All Notifications
Jane O'Connell NYSDEC	(718) 482-4599 jane.oconnell@dec.ny.gov	All Notifications
Len Zinoman NYSDEC Site Control	(518) 402-9553 leonard.zinoman@dec.ny.gov	Notifications 1 and 8
Andre Obligado NYSDEC Section Chief	(718) 482-6412 Andre.obligado@dec.ny.gov	All Notifications
James Sullivan NYSDOH Project Manager	(518) 402-5584 james.sullivan@health.ny.gov	Notifications 4, 6, and 7

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

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

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The Site is located in the Gowanus neighborhood of Brooklyn, Kings County, New York, and is identified as Kings County Block 456 and Lot 13 on the NYC Tax Map (see **Figure 3**). The Site is an approximately 0.347-acre area bounded by Carroll Street to the northeast, 4th Avenue to the southeast, a community garden to the northwest, and a New York City Transit (NYCT) system substation to the southwest (see Figure 2 – Site Plan). The boundaries of the Site are more fully described in **Appendix A** – Environmental Easement. The owner and operator of the Site parcel at the time of issuance of this SMP is:

538 Carroll Street Borrower LLC
272 4th Avenue LLC
274 4th and Carroll LLC
497 Carroll Street, 6th Floor
Brooklyn, NY 11215

2.2 Physical Setting

2.2.1 Land Use

The Site currently comprises a 17-story mixed use commercial and residential building (under construction) with an interior courtyard that is under construction. The Site is zoned C4-4D (commercial) with an M1-4/R9A (residential) overlay. The current Site occupants include construction workers and inspectors. Once the new building is complete, occupants will include residents, building staff, maintenance crews, and commercial tenants.

Properties adjoining the Site and in the neighborhood surrounding the Site are predominantly mixed-use residential and commercial, with some industrial uses. The Site is bounded to the northeast by Carroll Street, followed by residential buildings and a café; to the southeast by 4th Avenue, followed by apartment buildings with first-floor commercial spaces; to the southwest by an NYCT system substation, followed by commercial buildings; and to the northwest by a community garden and vacant commercial building, followed by Denton Place. A Metropolitan Transit Authority (MTA) subway tunnel runs adjacent to the Site, under 4th Avenue.

2.2.2 Geology

Surface topography of the area surrounding the Site gently slopes down to the west toward the Gowanus Canal. Based on AKRF's Remedial Investigation (RI), the stratigraphy of the Site, from the surface down, generally consisted of historic fill material comprising brown sand, silt, and gravel with trace amounts of brick, glass, porcelain fragments, and concrete from surface grade to depths ranging between approximately 12 and 15 feet below sidewalk grade, underlain by presumed native gray and brown sand and gravel with some silt up to 20 feet below ground surface (bgs) (the terminus of the deepest soil boring).

Based on the post-remedial groundwater monitoring well installation logs, the current stratigraphy of the Site, from the surface down, generally consists of approximately 1-foot of clean imported gas permeable aggregate (GPA), followed by clean imported fill material comprising brown sand, some fine gravel from surface grade to depths ranging between approximately 10 and 15 feet below sidewalk grade, clean imported gravel between 15 and

17 feet below grade in some places, historic fill material comprising brown sand and silt with trace fine gravel and brick ranging to depths between approximately 12 and 17 feet below sidewalk grade, underlain by presumed native brown sand and silt with trace fine gravel up to 18 feet below sidewalk grade (the terminus of the groundwater monitoring well installation borings). A geologic cross sections are shown on **Figures 4A and 4B**. Site-specific soil boring logs are provided in **Appendix D.**

2.2.3 Hydrogeology

Based on AKRF's RI, groundwater beneath the Site ranges from elevation 3.46 feet to 6.33 feet NAVD88 (between approximately 12.75 and 15.33 feet below at-grade ground surface). Based on topography, regional groundwater is anticipated to flow in a generally westerly direction toward the Gowanus Canal. However, groundwater beneath the Site appears to flow in a south-southwesterly direction, which may be due to and/or affected by dewatering within the southwest-adjacent NYCT system substation and the east-adjacent NYCT D, N, and R train subway lines below 4th Avenue. A groundwater contour map is presented as **Figure 5**. Groundwater elevation data is provided in attached **Table 1**. Post-remedial groundwater monitoring well construction logs are provided in **Appendix D**.

2.3 Investigation and Remedial History

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

Phase I Environmental Site Assessment, 272 4th Avenue, Brooklyn, New York, AKRF, April 2019

AKRF prepared a Phase I Environmental Site Assessment (ESA) of Lot 23 on behalf of the Volunteer, dated April 2019. The report identified the following Recognized Environmental Conditions (RECs):

- At the time of the reconnaissance, former Lot 23 operated as an automobile collision repair facility. Chemical storage was observed throughout the Site, including small containers of hydraulic oil, cleaning products, and a 55-gallon drum containing anti-freeze. Staining was observed on the floors throughout the facility, and a system of floor drains, which apparently drained into the NYC sewer and were partially filled with stained sediment, were located in the central portion of the first-floor automobile maintenance area. Though not observed, it was presumed that an oil-water separator was located at former Lot 23. Three sealed, presumed former in-ground hydraulic lifts were observed in the first-floor maintenance area. Historical Sanborn maps and a city directory search identified historical automobile repair, sales and service, and gasoline filling from on-site tanks since at least 1926. Though the facility was heated with natural gas at the time of the inspection, evidence (an exterior vent pipe and interior piping) of historical bulk petroleum storage was observed. Former Lot 23 was also listed as a Resource Conservation and Recovery Act (RCRA) Small Quantity Generator (SQG) of characteristic ignitable waste in 1998.
- A review of Historical Sanborn maps indicated that a portion of Former Lot 23 was marshland, which was filled in for a bottle manufacturing facility sometime between 1888 and 1906. Historic fill in NYC commonly contains elevated concentrations of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals.

Phase I Environmental Site Assessment, 274 4th Avenue and 538 Carroll Street, Brooklyn, New York, AKRF, April 2021

AKRF prepared a Phase I ESA of former Lots 13 and 17 on behalf of the Volunteer, dated April 2021. The report identified the following RECs:

- At the time of the reconnaissance, former Lot 17 operated as an automobile repair facility, and Lot 13 was a vacant two-story commercial building that was most recently operated as a restaurant with second story office space. Chemical storage was observed throughout former Lot 17, including small containers of lubricants, hydraulic and automotive oils, washer fluids, and paints; multiple 55-gallon drums containing waste motor oil, anti-freeze, and windshield wiper fluid; and one 275-gallon waste oil aboveground storage tank (AST). A floor drain was present in the vehicle maintenance area adjacent to a chemical and petroleum storage area within Lot 17, and the floors within the maintenance area appeared to be pitched towards the drain. The concrete floor within a chemical storage room was heavily stained and in poor condition with many cracks.
- Historical Sanborn maps, a city directory search, and a review of certificates of occupancy identified a historical automobile service shop, a bottle manufacturer, an electric works, enameling, a machine shop, metal finishing, manufacturing, an iron works, and a metal/wood finishing shop at one or both of the lots.
- Lot 23, which was considered the north and east-adjacent property at the time of the Phase I ESA, was identified as a NYSDEC BCP site (BCP Site No. C224298.) A subsurface investigation (SI) performed at former Lot 23 in April 2019 identified petroleum-and-chlorinated solvent-related VOC, polycyclic aromatic hydrocarbon (PAH), and metals contamination in soil, groundwater, and/or soil vapor. The contamination was noted to likely be attributable to historical industrial, commercial, and automotive uses. Former Lot 23 was also identified in the Resource Conservation and Recovery Information System (RCRIS) database as an SQG after generating solid wastes that exhibited characteristics of ignitability in 1998, and in the Environmental Data Resources (EDR) Historic Auto Station database for a historical automobile repair and filling station.

Remedial Investigation Report, 272 4th Avenue, Brooklyn, New York, AKRF, June 2022

The results of the April 2019 SI and September 2020 RI at 272 4th Avenue (former Lot 23), and the May 2021 SI and December 2021 RI at 274 4th Avenue and 538 Carroll Street (former Lots 13 and 17), were summarized in the June 2022 Remedial Investigation Report (RIR).

Fifty-seven soil samples (including four blind duplicate samples) were collected for laboratory analysis. The results are as follows:

- Five target compound list (TCL) VOCs [1,2,4-trimethylbenzene, acetone (a common laboratory contaminant), chlorobenzene, methyl ethel ketone, and total xylenes] were detected in one or more of the soil samples above their respective 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs) and/or Protection of Groundwater Soil Cleanup Objectives (PGWSCOs).
- Eleven TCL SVOCs [4-methylphenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, dibenzofuran, indeno(1,2,3-c,d)pyrene, naphthalene, and phenol] were detected above their UUSCOs and/or Restricted Residential Soil Cleanup Objectives (RRSCOs) in one or more of the soil samples analyzed. Most of the elevated SVOCs were PAHs, which are commonly found in historic fill in NYC.

- The pesticides 4,4'-DDD and 4,4'-DDT were detected above their respective UUSCOs, but below their RRSCOs, in one soil sample analyzed. Total polychlorinated biphenyls (PCBs) were not detected above their respective UUSCOs and/or RRSCOs in the soil samples analyzed.
- Nine metals (arsenic, barium, cadmium, copper, lead, mercury, nickel, silver, and zinc) were detected at concentrations above their respective UUSCOs and/or RRSCOs (some from diluted analyses) in one or more of the soil samples.
- Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were not detected above the NYSDEC Unrestricted Use Guidance Values (UUGVs) or Restricted Residential Guidance Values (RRGVs) in the soil samples analyzed. 1,4-Dioxane was not detected above the UUSCOs or RRSCOs in the soil samples analyzed.

Five sediment samples were collected from the drainage system catch basins in the at-grade slab on former Lot 23 (272 4th Avenue). The results are as follows:

- Three VOCs (acetone, methylene chloride, and toluene) were detected above their respective UUSCOs and PWGSCOs, but below their respective RRSCOs, in up to three of the sediment samples analyzed.
- The pesticides 4,4'-DDD and 4,4'-DDE were detected above their respective UUSCOs, but below their respective RRSCOs, in one sample.
- Total PCBs were detected above the UUSCO, but below the RRSCO, in four of the five sediment samples.
- Eight metals (arsenic, barium, cadmium, copper, lead, mercury, nickel, and zinc) were detected at concentrations above their respective UUSCOs and/or RRSCOs (some from diluted analyses) in one or more of the sediment samples.

Eighteen groundwater samples (including three blind duplicate samples) were collected for laboratory analysis. The results are as follows:

- Thirteen TCL VOCs (1,2,4,5-tetramethylbenzene, 1,2,4-trimethylbenzene, 1,2-dichlorobenzene, 1,3,5-trimethylbenzene, benzene, chlorobenzene, isopropylbenzene, m,p-xylenes, methylene chloride, n-butylbenzene, n-propylbenzene, o-xylene, and sec-butylbenzene) were detected above their NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (AWQSGVs) in one or more of the groundwater samples.
- Nine TCL SVOCs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, indeno(1,2,3-c,d)pyrene, naphthalene, and phenol] were detected above their AWQSGVs in one or more of the groundwater samples analyzed.
- The pesticides dieldrin and gamma-BHC were detected above their respective AWQSGVs in one groundwater sample. Total PCBs were detected at concentrations above the AWQSGV in three of the groundwater samples plus one blind duplicate sample.
- Six metals (arsenic, iron, lead, magnesium, manganese, and sodium) were detected in one or more total (unfiltered) groundwater samples at concentrations above their respective AWQSGVs. Five metals (arsenic, iron, magnesium, manganese, and sodium) were detected in one or more dissolved (filtered) groundwater samples above their respective AWQSGVs.

- PFOA and PFOS were detected in one or more of the groundwater samples above the NYSDEC Screening Level of 10 parts per trillion (ppt). 1,4-Dioxane was not detected in the groundwater samples.

Seventeen sub-slab soil vapor samples, five subsurface soil vapor samples, four indoor air samples (co-located with four of the sub-slab soil vapor samples), and four ambient air samples were collected from the Site. The results are as follows:

- The four co-located sub-slab soil vapor and indoor air samples were compared to the appropriate New York State Department of Health (NYSDOH) Decision Matrices. When evaluating trichloroethylene (TCE) concentrations in sub-slab soil vapor and indoor air for samples RI-SV-03_20200923/RI-IA-03_20200923 [109 micrograms per cubic meter (µg/m^3) and 0.29 µg/m^3, respectively] using the NYSDOH Soil Vapor/Indoor Air Matrix A, the result was "mitigate." When evaluating tetrachloroethylene (PCE) concentrations in sub-slab soil vapor and indoor air for samples RI-SV-03_20200922/RI-IA-03_20200922 (773 µg/m^3 and 7.39 µg/m^3, respectively) using the NYSDOH Soil Vapor/Indoor Air Matrix B, the result was "monitor." When evaluating PCE concentrations in sub-slab soil vapor and indoor air for samples RI-SV-01_20200922/RI-IA-01_20200922 (1,270 µg/m^3 and 0.515 µg/m^3, respectively), the result was "mitigate."

Based on the petroleum-like odors, staining, and elevated PID detections in soil, elevated petroleum-related VOC and SVOC concentrations in soil sample analytical results, and VOC and SVOC detections in groundwater samples collected during the RI at 272 4th Avenue, NYSDEC Spill No. 2005727 was assigned to the Site on September 23, 2020

Remedial Action Work Plan, 272 4th Avenue, Brooklyn, New York, AKRF, July 2022

The Site was remediated in accordance with the remedy approved by NYSDEC in the July 2022 Remedial Action Work Plan (RAWP) and July 2022 Decision Document issued by NYSDEC. The factors considered during the selection of the remedy are those listed in 6 NYCRR Part 375-1.8. The following are the components of the selected remedy:

- Soil/fill was excavated and removed from the Site to achieve a combination Track 2 and Track 4 remedy. Remedial excavation extended to varying depths ranging from approximately 2 feet bgs to 17 feet bgs across the Site, and included:
  a. Excavation to between 2 and 12 feet bgs in the Track 4 area to remove source material, including petroleum-contaminated soil identified during implementation of the RAWP along the eastern Site boundary and in the eastern portion of the Site associated with eight (8) previously unknown underground storage tanks (USTs) discovered during remedial excavation; and
  b. Excavation ranging from depths of approximately 13 to 17 feet bgs in the Track 2 area, which included material from the area of the partial cellar and groundwater treatment area to remove petroleum-contaminated source material associated with NYSDEC Spill No. 2005727.
- A groundwater treatment program consisting of the application and mechanical mixing of Regenesis Oxygen Release Compound® (ORC) was performed to address residual groundwater contamination associated with NYSDEC Spill No. 2005727. Three permanent groundwater wells were subsequently installed as part of a quarterly monitoring program.
- A vapor mitigation system, consisting of the sub-slab piping for the active sub-slab depressurization system (SSDS) and a minimum 0.20-mil vapor barrier, was installed beneath the new building slab and cellar walls to mitigate potential soil vapor intrusion.

- Site-wide dewatering was implemented in accordance with all federal, state, and local regulations, as necessary, to enable the remedial excavation activities.
- A Community Air Monitoring Plan (CAMP) was implemented during all intrusive Site activities to monitor levels of VOCs and particulates within the active work-zones and around the perimeter of the Site.
- During any intrusive Site work, screening was conducted for indications of soil contamination [i.e., by visual means, odor, and monitoring with photoionization detector (PID)].
- Appropriate off-site disposal of all materials removed from the Site was performed in accordance with all federal, state, and local rules and regulations for handling, transport, and disposal. Waste disposal facilities were selected based on waste classification sampling and data collected prior to the Remedial Action.
- Imported fill meeting the requirements of 6 NYCRR Part 375-6.7(d) was used to replace excavated soil and/or establish the designed grades beneath the site-wide building slabs.
- Forty-four (44) documentation samples were collected across the Site and analyzed to evaluate the performance of the remedy with respect to attainment of RRSCOs and/or PGWSCOs (VOCs only). Documentation sample frequency was based on the sampling frequency outlined in Section 5.4 of DER-10.
- A Site-wide cover system consisting of minimum 6-inch-thick concrete building slabs or a minimum 2-foot-thick, clean soil cover in landscaped areas was constructed in the Track 4 area of the Site.
- Flood prevention measures were deployed at the Site during rain events to prevent soil/fill from exiting the Site during neighborhood-wide flash flood events.
- An Environmental Easement was executed and recorded to restrict land use to Restricted Residential Use, inclusive of Commercial and Industrial Use (subject to local zoning) and prevent future exposure to any contamination remaining at the Site.
- This SMP was developed for long-term management of remaining contamination, as required by the Environmental Easement. The SMP includes plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated July 2022 are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

2.5 Remaining Contamination

2.5.1 Soil

Following completion of soil excavation and removal activities, documentation soil sampling was conducted with a total of 44 samples collected. Results of the soil documentation samples indicated that residual soil contamination that exceeds PGWSCOs (for VOCs only) and RRSCOs (for all analyses) remains in place below the Track 4 remedial excavation depth, which includes the 2-foot excavation throughout the Track 4 area, the 8-foot excavation in the western portion of the Site to remove one 550-gallon UST, and the approximately 10- to-15-foot excavation along the eastern portion of the Site to remove seven USTs within the groundwater treatment area. To prevent future exposure to remaining contamination, a Site-wide cover system consisting of a combination of concrete building slabs and a minimum 2-foot clean soil cover in landscaped areas was constructed during the Remedial Action. Residual contamination in soil that does not exceed the RRSCOs and/or PGWSCOs (for VOCs only) is in place beneath the Track 2 area, which comprises the central portion of the Site. A map of documentation samples that exceeded RRSCOs and/or PGWSCOs, which show the remaining contamination at the Site, is presented as **Figure 6**. A summary of the remaining documentation samples that exceeded RRSCOs and/or PGWSCOs, as applicable, is presented in **Table II** below:

Table II
Documentation Samples Results with RRSCO and/or PGWSCO Exceedances

Analyte	Sample Identification	RRSCO (mg/kg)	PGWSCO (mg/kg)	Concentration (mg/kg)
1,2,4-Trimethylbenzene	BS-01_15_20231212	0.52	5.9	**19 H**
	BS-02_15_20231212			**0.99 H**
	EP-08_2_20231013			**8 H**
1,2-Dichlorobenzene	BS-01_15_20231212	100	1.1	1.8 H
1,3,5-Trimethylbenzene (Mesitylene)	BS-01_15_20231212	0.52	3.1	**5.8 H**
	EP-08_2_20231013			**4.3 H**

Analyte	Sample Identification	RRSCO (mg/kg)	PGWSCO (mg/kg)	Concentration (mg/kg)
Acetone	BS-04_17_20240117	100	0.03	0.045 J
	BS-07_17_20240123			0.11 J
	BS-08_17_20240126			0.049
	SW-06_17_20240117			0.078 J
	SW-13_15_20240126			0.039
	SW-14_17_20240126			0.065
	SW-17_17_20240131			0.051
	X-17_20240123			0.16 J
Benzene	BS-01_15_20231212	3.7	0.06	0.17 H
Chlorobenzene	BS-01_15_20231212	100	1.1	4.2 H
Methylene Chloride	EP-08_2_20231013	81	0.05	4.4 H
Xylenes, Total	BS-01_15_20231212	100	1.2	13 H
	EP-08_2_20231013			3.2 H
Benzo(a)Anthracene	EP-01_2_20231005	1.4	NA	**17 L**
	EP-04_2_20231005			**3.7 L**
	EP-08_2_20231013			**4.5 L**
	EP-09_2-6_20231215			**1.6**
	SW-09_17_20240123			**2.1 R**
	UST-B_8_20231018			**13 J**
	UST-NW_7_20231018			**7.5 J**
	UST-SW_7_20231018			**3.7 J**
	UST-WW_7_20231018			**1.9 J**
	UST-X_20231018			**34 J**
Benzo(a)Pyrene	EP-01_2_20231005	1	NA	**16 L**
	EP-02_2_20231005			**1.2 L**
	EP-03_2_20231005			**1.4 L**
	EP-04_2_20231005			**3.9 L**
	EP-07_2_20231005			**1.3 L**
	EP-08_2_20231013			**4.3 L**
	EP-09_2-6_20231215			**1.8**
	SW-09_17_20240123			**2.2 R**
	UST-B_8_20231018			**13 J**
	UST-EW_7_20231018			**1.2 J**
	UST-NW_7_20231018			**8.3 J**
	UST-SW_7_20231018			**3.8 J**
	UST-WW_7_20231018			**1.8 J**
	UST-X_20231018			**28 J**

Analyte	**Sample Identification**	**RRSCO (mg/kg)**	**PGWSCO (mg/kg)**	**Concentration (mg/kg)**
Benzo(b)Fluoranthene	EP-01_2_20231005	1.4	NA	**18 L**
	EP-03_2_20231005			**1.6 L**
	EP-04_2_20231005			**4.6 L**
	EP-07_2_20231005			**1.5 L**
	EP-08_2_20231013			**4.8 L**
	EP-09_2-6_20231215			**2**
	SW-09_17_20240123			**2.2 R**
	UST-B_8_20231018			**14 J**
	UST-NW_7_20231018			**9.3 J**
	UST-SW_7_20231018			**4.2 J**
	UST-WW_7_20231018			**2.1 J**
	UST-X_20231018			**32 J**
Benzo(g,h,i)Perylene	EP-01_2_20231005	4.9	NA	**7.2 L**
	UST-B_8_20231018			**6.3 J**
	UST-X_20231018			**14 J**
Benzo(k)Fluoranthene	UST-X_20231018	4.9	NA	**11 J**
Chrysene	EP-01_2_20231005	4.9	NA	**17 L**
	UST-B_8_20231018			**13 J**
	UST-NW_7_20231018			**6.6 J**
	UST-X_20231018			**30 J**
Dibenz(a,h)Anthracene	EP-01_2_20231005	0.33	NA	**1.9 L**
	EP-04_2_20231005			**0.54 L**
	EP-08_2_20231013			**0.58 J**
	UST-B_8_20231018			**1.8 J**
	UST-NW_7_20231018			**1.2 J**
	UST-SW_7_20231018			**0.49 J**
	UST-X_20231018			**4 J**
Indeno(1,2,3-c,d)Pyrene	EP-01_2_20231005	1.4	NA	**9.1 L**
	EP-04_2_20231005			**2.8 L**
	EP-08_2_20231013			**2.5 L**
	UST-B_8_20231018			**6 J**
	UST-NW_7_20231018			**5.2 J**
	UST-SW_7_20231018			**2.1 J**
	UST-X_20231018			**17 J**

Analyte	**Sample Identification**	**RRSCO (mg/kg)**	**PGWSCO (mg/kg)**	**Concentration (mg/kg)**
Phenanthrene	EP-01_2_20231005	4.9	NA	**28**
	EP-08_2_20231013			**13 L**
	SW-09_17_20240123			**5.1 R**
	UST-B_8_20231018			**37 J**
	UST-NW_7_20231018			**7.4 J**
	UST-SW_7_20231018			**6.6 J**
	UST-X_20231018			**95 J**
Cadmium	EP-08_2_20231013	2.5	NA	**2.75**
Chromium, Hexavalent	EP-08_2_20231013	1	NA	**1.26**
Copper	EP-03_2_20231005	280	NA	**457**
	EP-04_2_20231005			**466**
Lead	EP-01_2_20231005	400	NA	**880**
	EP-02_2_20231005			**1,740**
	EP-03_2_20231005			**1,100**
	EP-04_2_20231005			**749**
	EP-07_2_20231005			**597**
	EP-08_2_20231013			**849**
	EP-09_2-6_20231215			**1,810**
	UST-B_8_20231018			**1,350**
	UST-EW_7_20231018			**1,650**
	UST-NW_7_20231018			**910**
	UST-SW_7_20231018			**1,000**
	UST-WW_7_20231018			**939**
	UST-X_20231018			**826**
Mercury	EP-01_2_20231005	0.26	NA	**2.49**
	EP-02_2_20231005			**1.27**
	EP-03_2_20231005			**2.02**
	EP-04_2_20231005			**5.05**
	EP-06_2_20231005			**2.57**
	EP-07_2_20231005			**1.7**
	EP-08_2_20231013			**4.16**
	EP-09_2-6_20231215			**2.04**
	EP-10_2-6_20231215			**0.299**
	SW-04_10_20231211			**0.439**
	UST-B_8_20231018			**3.46 J**
	UST-EW_7_20231018			**24 J**

Analyte	Sample Identification	RRSCO (mg/kg)	PGWSCO (mg/kg)	Concentration (mg/kg)
Mercury (continued)	UST-NW_7_20231018	0.26	NA	**5.07 J**
	UST-SW_7_20231018			**4.08 J**
	UST-WW_7_20231018			**1.8 J**
	UST-X_20231018			**13.6 J**

Notes:
H = Sample result is estimated and biased high.
J = The concentration given is an estimated value.
L = Sample result is estimated and biased low.
NA = Not applicable.
R = Indicates that a quality control parameter has exceeded laboratory limits.
mg/kg = milligrams per kilogram
X-17_20240123 is a blind duplicate of sample SW-07_17_20240117
UST-X_20231018 is a blind duplicate of sample UST-B_8_20231018
Exceedances of Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs) are highlighted in bold font.
Exceedances of Part 375 Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) are highlighted in gray shading.

Figure 2 summarizes the locations of excavation and documentation sample collection. **Attached Tables 2 through 7** and **Figure 6** summarize the results of all soil samples collected that exceeded the UUSCOs, RRSCOs, and/or PGWSCOs at the Site after completion of Remedial Action.

2.5.2 Groundwater

Groundwater quality was characterized during previous investigations prior to entering the BCP and during the RI, as described in Section 2.3. Based on analytical results from samples collected during the RI, groundwater beneath the Site was found to have concentrations above the AWQSGVs, including certain VOCs, SVOCs, PCBs, pesticides, and total and dissolved metals. PFOS and PFOA were also detected above their NYSDEC PFAS Screening Levels in multiple samples. Based on the petroleum-like odors, staining, and elevated PID detections in soil, elevated petroleum-related VOC and SVOC concentrations in soil sample analytical results, and VOC and SVOC detections in groundwater samples collected during the RI at 272 4th Avenue, NYSDEC Spill No. 2005727 was assigned to the Site on September 23, 2020.

To address groundwater contamination associated with NYSDEC Spill No. 2005727, approximately 1,000 pounds of ORC mixed with gravel backfill were applied to the remedial excavation area and mechanically mixed within the groundwater treatment area to enhance natural biodegradation of the residual petroleum contamination.

Following groundwater treatment, three permanent monitoring wells (MW-01, MW-02, and MW-03) were installed at three locations (downgradient, central, and upgradient of the treatment area, respectively) to monitor natural attenuation of petroleum VOCs in groundwater. The wells were developed following installation, and in May 2024, post-remediation baseline groundwater samples were collected and submitted for laboratory analysis of VOCs. Laboratory analytical results for VOCs revealed concentrations of benzene, toluene, ethylbenzene, and xylenes (collectively referred to as BTEX), 2-butanone (MEK), 4-methyl-2-pentanone (MIBK), acetone, chlorobenzene, methyl-tert-butyl ether (MTBE), methylene chloride, and tetrachloroethene (PCE) below the

AWQSGVs, in the groundwater sample collected from MW-01. Toluene and acetone were detected above the AWQSGVs at 5.7 ug/L and 79 µg/L, respectively, in the groundwater sample collected from MW-01. The monitoring well is located adjacent to the groundwater treatment area, indicating that some residual groundwater contamination remains in the subsurface in the central portion of the Site. However, natural attenuation of residual BTEX is expected. Acetone was not a CoC for this remediation, and the detection may be related to laboratory contamination and not groundwater conditions at the Site. Groundwater use at the Site is subject to the ICs documented within the Environmental Easement.

A map of post-remedial groundwater sample results that exceeded the AWQSGVs is presented in **Figure 7**. The post-remedial groundwater sample results that exceeded the AWQSGVs is summarized in Table III below and in **Attached Table 8**.

Table III
Post-Remedial Groundwater Sample Analytical Results

Analyte	Sample Identification	AWQSGV (µg/L)	Concentration (µg/L)
Acetone	MW-01_20240515	50	79
Toluene	MW-01_20240515	5	5.7

Notes:
µg/L = micrograms per liter

2.5.3 Soil Vapor

Analytical results from the soil vapor, indoor air, and/or ambient air samples collected during previous investigations identified petroleum-related VOCs (including BTEX) and chlorinated solvents in soil vapor, indoor air, and/or ambient air at the Site. PCE was detected in soil vapor at concentrations up to 7,120 µg/m^3, and BTEX compounds were detected in soil vapor at concentrations up to 26,200 µg/m^3. To prevent migration of contaminated soil vapor into the new building, a vapor mitigation system consisting of an active SSDS has been installed beneath the at-grade portions of the new building slabs as an engineering control.

Soil vapor, indoor air, and ambient air sample results from the RI are summarized in Attached **Table 9** and **Figure 8**.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

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

This plan provides:

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

3.2 Institutional Controls

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

- The Controlled Property may be used for Restricted Residential use as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial use as described in 6 NYCRR Part 375-1.8(g)(2)(iii), and Industrial use as described in 6 NYCRR Part 375-1.8(g)(2)(iv).
- All ECs must be operated and maintained as specified in this SMP.
- All ECs must be inspected at a frequency and in a manner defined in this SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP.
- Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in this SMP.

- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP.
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP.
- Access to the Site must be provided to agents, employees, or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.

3.3 Engineering Controls

3.3.1 Cover System

Exposure to remaining contamination at the Site is prevented by a cover system placed over the Site. This cover system is comprised of a minimum 6-inch-thick concrete building slab within the slab-on-grade portion of the Site in the Track 4 area. The landscaped portion of the Site, which is also within the Track 4 area, is comprised of a minimum 2-foot clean soil cover in order to prevent human exposure to residual contamination in soil/fill. **Figure 9** presents the location of the cover system and applicable demarcation layers. The EWP provided in **Appendix E** outlines the procedures required to be implemented in the event that the cover system is breached, penetrated, or temporarily removed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and CAMP prepared for the Site provided in **Appendix F**. Any breach of the Site's cover system must be overseen by a P.E. who is licensed and registered in New York State or a qualified person who directly reports to a P.E. who is licensed and registered in New York State.

3.3.2 Sub-slab Depressurization System (SSDS)

An active SSDS was installed to mitigate the potential for sub-slab vapor intrusion into the new building. As the new building's cellar slab is within the water table, the SSDS was installed beneath the slab-on-grade portion of the building only. The SSDS induces a negative pressure (i.e., vacuum) beneath the proposed building slab. The SSDS installed at the Site is comprised of the following components:

- A minimum 6-inch-thick GPA layer was installed immediately beneath the concrete building slabs and vapor barrier in at-grade portions of the building. The bottom of partial cellar slab is constructed within groundwater, and therefore, the SSDS does not extend to this area; however, a waterproofing membrane that also acts as a vapor barrier was installed beneath the slab and on the cellar walls;
- Three SSDS branches consisting of 0.02-inch slotted 4-inch-diameter Schedule 40 polyvinyl chloride (PVC) pipe lengths were installed beneath the building slabs. The slotted piping transitions to solid 4-inch-diameter Schedule 40 PVC pipe lengths as the branches approach the manifold;
- All horizontal portions of solid SSDS piping were pitched a minimum of 1% towards slotted piping segments. Condensate drains were installed at low points in the SSDS branches with solid piping, as necessary;

- Three SSDS vacuum monitoring points (MP-01 through MP-03) were installed beneath the ground floor building slab; and
- Though not an EC, a vapor barrier (Grace Preprufe® 300R, Grace Preprufe® 160R, and Grace Bituthene® 3000) was installed across the full extent of the building slab, and on subsurface foundation cellar walls as an element of construction,

The following elements of the SSDS will be installed at the Site during building construction:

- The SSDS piping will be connected to a pipe manifold, which combines the PVC pipe sections into a single 6-inch-diameter header. The three SSDS branches will connect to the pipe manifold within the partial cellar and will continue as one 6-inch galvanized steel riser to the fifteenth-floor roof. The riser will terminate above the roofline with a blower and exhaust stack. The exhaust stack will terminate at least 2 feet above parapets on an unoccupied roof area, and at least 15 feet from all windows, openings, air intakes, outdoor occupied spaces, etc.
- A blower [make/model: Geiger AF-15 (or equivalent)] will be installed to achieve a minimum induced sub-slab vacuum of 0.004 inches of water column (inH2O), with shut-off alarm connected to alarm panel installed in the building. The blower will be installed atop the bulkhead roof above the fifteenth floor of the new building.
- Variable-frequency drive (VFD) to throttle blower operation will be installed;
- Installation of control panels equipped with a telemetry alarm system to notify select personnel (AKRF Project Manager, Deputy Project Manager, and building operations personnel) will be installed; and
- Accessories—including cleanouts, sample ports, vacuum indicators/pressure gauges, flow meters, butterfly valves, and differential pressure switches—will be installed.

The SSDS complies with the requirements stated in Section 11 of the RAWP. The layout of the SSDS piping is shown on **Figure 10**. As-built drawings for the underground components of the SSDS are included in **Appendix G**.

Procedures for operating and maintaining the SSDS are outlined in the Operation and Maintenance Plan (Section 5.0 of this SMP). Procedures for monitoring the SSDS are included in the Monitoring and Sampling Plan (Section 4.0 of this SMP). The Monitoring and Sampling Plan also addresses severe condition inspections in the event that a severe condition occurs, which may affect controls at the Site.

3.3.3 Criteria for Completion of Remediation/Termination of Mitigation Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the RAOs identified by the Decision Document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. Unless waived by the NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the Site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

As discussed below, the NYSDEC may approve termination of a groundwater monitoring program. When a remedial party receives this approval, the remedial party will decommission all Site-related monitoring, injection and recovery wells as per the NYSDEC CP-43 policy.

The remedial party will also conduct any needed site restoration activities, such as asphalt patching and decommissioning treatment system equipment. In addition, the remedial party will conduct any necessary restoration of vegetation coverage, trees, and wetlands, and will comply with NYSDEC and United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the Site.

3.3.3.1 - Cover System

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

3.3.3.2 - SSDS

The SSDS will not be discontinued unless prior written approval is granted by the NYSDEC and NYSDOH project managers. If monitoring data indicates that the SSDS may no longer be required, a proposal to discontinue the SSDS will be submitted by the remedial party to the NYSDEC and NYSDOH project managers.

3.3.3.3 - Post-Treatment Monitoring Wells

Groundwater monitoring activities to assess natural attenuation following groundwater treatment will continue, as determined by the NYSDEC project manager in consultation with the NYSDOH project manager, until residual groundwater concentrations are found to be consistently below AWQSGVs or the Site standards, criteria, and guidance (SCGs), or have become asymptotic at an acceptable level over an extended period. If monitoring data indicates that monitoring may no longer be required, a proposal to discontinue the monitoring will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC project manager. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional injections, source removal, treatment, and/or control measures will be evaluated.

4.0 MONITORING AND SAMPLING PLAN

4.1 General

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

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

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC SCGs, particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

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

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site-wide Inspection

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

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- Whether stormwater management systems, such as basins and outfalls, are working as designed;

- The site management activities being conducted, including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirmation that Site records are up to date.

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

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If Site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this SMP.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs, occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC project manager must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the ICs/ECs implemented at the Site by a QEP, as defined in 6 NYCRR Part 375. Written confirmation must be provided to the NYSDEC project manager within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. The remedial party will submit follow-up status reports to the NYSDEC within 45 days of the event on actions taken to respond to any emergency event requiring ongoing responsive action, describing and documenting actions taken to restore the effectiveness of the ECs.

4.3 Treatment System Monitoring and Sampling

4.3.1 SSDS Monitoring

Monitoring of the SSDS will be performed on a routine basis, as identified in **Table IV** SSDS Monitoring Requirements and Schedule (see below). The monitoring of mitigation systems must be conducted by a QEP as defined in 6 NYCRR Part 375, a P.E. who is licensed and registered in New York State, or a qualified person who directly reports to a P.E. who is licensed and registered in New York State. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSDS has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SSDS components to be monitored include, but are not limited to, the components included in **Table IV** below.

A network of sub-slab vacuum monitoring points has been installed to monitor sub-slab soil vapor conditions at the Site. Three (3) permanent sub-slab soil vapor points (MP-01 through MP-03) were installed throughout the at-grade slab within the new building on-site. The locations of the sub-slab soil vapor points are shown on **Figure 10**.

The inspection frequency may be modified based on field screening with the approval of NYSDEC. This SMP will be modified to reflect any changes in monitoring plans approved by NYSDEC. The applicable monitoring log is provided in **Appendix I.**

Table IV
SSDS Monitoring Requirements and Schedule

Mitigation System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Vacuum Monitoring Points	Induced Vacuum Reading	$\geq$ 0.004 inH$_2$O	Monthly for first quarter and quarterly thereafter
Individual SSDS Lines	Flow Rate and Applied Vacuum	Varies - see Log Sheets	Monthly for first quarter and quarterly thereafter
Riser Pipe from Manifold to Roof	Flow Rate and Applied Vacuum	Varies - see Log Sheets	Monthly for first quarter and quarterly thereafter
Aboveground System Components	Visual Intactness	NA	Monthly for first quarter and quarterly thereafter

Notes:
inH$_2$O = inches of water column
NA = not applicable

A complete list of components to be inspected is provided in the Inspection Checklist, provided in **Appendix I**. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.4 Post-Remediation Media Monitoring and Sampling

Post-remediation groundwater samples will be collected from the monitoring wells on a routine basis. Sampling locations, required analytical parameters, and a schedule are provided in **Table V** and **Table VI**, below. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

4.4.1 Groundwater Sampling

The network of monitoring wells, as shown on **Figure 7**, has been installed to monitor remaining groundwater contamination at upgradient, central, and downgradient locations across the Site. Well locations were relocated outside of the partial cellar prior to installation with consultation with NYSDEC, based on the groundwater elevation with respect to the partial cellar slab elevation, to prevent potential flooding within the partial cellar during periods of unusually high groundwater elevations. Table V summarizes each well's purpose, location, depth, diameter, and screened interval.

Table V
Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (longitude/ latitude)[1]	Well Diameter (inches)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Elevation (above msl)
MW-01	Downgradient	40° 40'33.9669/ -073° 59'04.1526	2	10	20	23.66

Monitoring Well ID	Well Location	Coordinates (longitude/ latitude)[1]	Well Diameter (inches)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Elevation (above msl)
MW-02	Central	40° 40' 33.8452/ -073° 59'04.2239	2	10	20	27.70
MW-03[2]	Upgradient	40° 40'33.4875/ -073° 59'04.1313	2	8	18	18.12

Notes:
[1] All elevations are measured using North American Vertical Datum of 1988 (NAVD88) and locations are measured using the North American Datum of 1983 – Long Island Zone.
[2] MW-03 is located within a ground floor commercial space. The location is secure, and access to the wells for sampling and/or maintenance will be a requirement for any future tenant within the space.
ft bgs = feet below ground surface, msl = mean sea level, ° = degrees

The remedial party will measure depth to the water table for each monitoring well in the network before sampling. Groundwater monitoring will be performed on a quarterly basis for two years (8 quarters), with one sample collected from each of the three groundwater monitoring wells (MW-01, MW-02, and MW-03). Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

Monitoring well construction logs are included in **Appendix D** of this SMP. Deliverables for the groundwater monitoring program are specified below and in Section 7.0 – Reporting Requirements.

The samples will be collected using United States Environmental Protection Agency (EPA) low flow techniques and then submitted to a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory for analysis of TCL VOCs using Category B deliverables, as summarized in **Table VI**. One blind duplicate, one field blank, one trip blank, and one matrix spike/matrix spike duplicate (MS/MSD) sample will be collected for quality assurance/quality control (QA/QC) purposes. The groundwater data will be reviewed by a third-party validator, and a DUSR will be prepared to document the usability and validity of the data. All purged groundwater will be containerized in 55-gallon drums for future off-site disposal at a permitted facility.

Table VI
Post-Remediation Groundwater Sampling Requirements and Schedule

Sampling Location	Analytical Parameters	Reporting Limit (µg/L)	Schedule
MW-01	TCL VOCs (EPA Method 8260)	AWQSGVs	Quarterly
MW-02	TCL VOCs (EPA Method 8260)	AWQSGVs	Quarterly
MW-03	TCL VOCs (EPA Method 8260)	AWQSGVs	Quarterly

Notes:
µg/L = micrograms per Liter
AWQSGVs = Ambient Water Quality Standards and Guidance Values

The groundwater analytical results will be reported to NYSDEC in a brief letter report, which will include a summary of the ongoing laboratory analytical results, a comparison to the baseline groundwater analytical results, and recommendations for additional groundwater treatment, if necessary. The first post-remediation groundwater sampling event occurred on May 10 and 15, 2024. Quarterly sampling events will begin upon receipt of the COC in December 2024, and quarterly thereafter for one year (January, April, July, and October 2025).

Based on the post-remediation sampling results, additional groundwater treatment events may be required in the future. If supplemental groundwater treatment is required based on the results of the first year of periodic groundwater monitoring, a groundwater treatment design report will be prepared and submitted to NYSDEC and NYSDOH for review and approval. Additional groundwater monitoring will be conducted if subsequent treatment events are requested. Modification to the frequency or sampling requirements will require approval from NYSDEC.

4.4.2 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and the associated sampling logs provided in **Appendix I** – Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will also be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network.

Prior to collecting the samples, but after removing the well cap, each well will be screened for the presence of VOCs using a PID. The depth to groundwater will then be measured in the wells using an electronic oil/water interface probe attached to a measuring tape accurate to 0.01 foot; this will also be used to gauge potential measurable product on the surface of the water table. The water level data, well diameter, and depth to bottom will be used to calculate the volume of water in each well, and any separate-phase product will be documented, if present. The wells that do not contain separate-phase product will then be purged and sampled using low-flow purging techniques.

Groundwater samples will be collected using dedicated polyethylene tubing and placed directly into laboratory-supplied sample bottles. The samples will be analyzed by a NYSDOH ELAP-certified laboratory with NYSDEC Category B deliverables. For wells that contain separate-phase product (not anticipated), a sample of the product will be collected and analyzed for flashpoint. All non-dedicated sampling equipment (e.g., submersible pumps and oil/water interface probes) will be decontaminated between sampling locations using the following procedure:

1. Scrub equipment with a bristle brush using a tap water/Simple Green® or Alconox® solution.
2. Rinse with tap water.
3. Scrub again with a bristle brush using a tap water/Simple Green® or Alconox® solution.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment.

4.4.3 Monitoring Well Repairs and Decommissioning

If biofouling or silt accumulation occurs in the on-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, if an event renders the wells unusable, the monitoring wells will be properly decommissioned and replaced. Repair and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled CP-43: Groundwater Monitoring Well Decommissioning Procedures. Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by NYSDEC.

The sampling frequency may only be modified with the approval of NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by NYSDEC. Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.4.4 Soil Vapor Intrusion Evaluation (SVIE)

Any on-site buildings are required to have an active SSDS, or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface. A pressure field extension test will be required to confirm that the system is mitigating the building effectively and operating as intended.

An SVIE will be conducted in the newly constructed building envelope to determine if the SSDS is operating as intended. The SVIE will comprise confirmatory soil vapor intrusion sampling (concurrent and co-located sub-slab and indoor air sampling), standalone indoor air sampling of areas to be used by sensitive populations, and ambient air sampling. The SVIE will be conducted prior to building occupancy and during the heating season, if feasible. Concurrent sub-slab soil vapor and indoor air samples will be collected in accordance with the October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York (with updates). The SVIE will include the collection of sub-slab soil vapor samples from three on-site vapor monitoring points (MP-01 through MP-03) and the collection of three indoor air samples that will be co-located with the sub-slab soil vapor samples. All indoor air samples will be collected from the breathing zone, approximately 4 feet above the floor. Indoor air samples will be collected from the following locations within the new building:

- IA-01: First Floor, lobby (northwestern portion of the new building);
- IA-02: First Floor, retail space (southeastern portion of the new building); and
- IA-03: First Floor, retail space (northeastern portion of the new building).

One ambient (outdoor) air sample (AA-1) will be collected for QA/QC purposes. The ambient air sample will also be collected from 3 to 4 feet above sidewalk grade to mimic the breathing zone. As the building will be a used for residential purposes, the sub-slab soil vapor, indoor air, and ambient air samples will be collected via 6-liter Summa canisters over an 24-hour period with the flow rate not to exceed 0.0042 liters per minute. The samples will be submitted to an ELAP-certified laboratory for analysis of VOCs via EPA Method TO-15.

The results of the SVIE will be documented in an SVIE report that will be submitted to NYSDEC and NYSDOH. All work will be completed in accordance with the HASP and

QAPP, included as **Appendices F and H**, respectively. Proposed sub-slab soil vapor, indoor air, and ambient air samples are shown on **Figure 10**.

No required vapor mitigation systems will be turned off or decommissioned without prior approval from NYSDEC. Requests to decommission vapor mitigation systems in the future may be submitted to NYSDEC for consideration and require sampling events conducted over multiple heating seasons, yielding data that demonstrates the system(s) is(are) no longer needed to address potential exposure concerns from soil vapor intrusion.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This Operation and Maintenance Plan provides a brief description of the measures necessary to operate, monitor, and maintain the mechanical components of the remedy selected for the Site. This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the Site to operate and maintain the SSDS; and
- Will be updated periodically to reflect changes in Site conditions or the manner in which the SSDS is operated and maintained.

Further detail regarding the operation and maintenance of the SSDS is provided in the specifications and operations manuals included in **Appendix J**. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP. A copy of this complete SMP is to be maintained at the Site.

5.2 Performance Criteria

An SSDS will be installed at the Site to prevent the potential for vapor intrusion into the building and will operate continuously. Subgrade components of the SSDS have been installed, and the above-ground components will be installed under this SMP. As-built drawings for the underground component of the SSDS are included in **Appendix G**, and the SSDS component specifications and manuals are included in **Appendix J**. Details pertaining to the performance monitoring of the SSDS are outlined below.

5.3 SSDS Operation and Maintenance

The following sections provide a description of the SSDS operations and maintenance. As-built drawings for the SSDS are provided as **Appendix G**, and system component specifications and operations manuals are provided in **Appendix J**.

5.3.1 SSDS Start-Up and Testing

The system will be fully installed and tested following installation and system startup, including:

- Vapor monitoring point (VMP) induced vacuum readings (MP-01 through MP-03);
- Individual line applied vacuum and air flow rate readings; and
- Combined riser applied vacuum readings.

Further adjustments to the blower and individual SSDS lines may be necessary during ongoing operation of the system. If necessary, SSDS equipment, including individual valves on SSDS lines, will be throttled to rebalance the system, adjusting air flow rates and vacuum/pressure readings to acceptable values.

At a minimum, the findings and conclusions following system start-up activities will be reported in the subsequent quarterly media monitoring report. In addition, depending on the nature of the adjustment to the system, the process and instrumentation diagram (P&ID) and/or Site figures may need to be updated to reflect the work completed. Such revisions shall be completed and submitted to NYSDEC with the media monitoring report.

All future modifications, adjustments, or additions to the SSDS will be completed in accordance with the equipment specifications provided by the manufacturer and included in Appendix J of this SMP. This SMP will be maintained on-site at all times.

The system testing described above will be conducted if, in the course of the SSDS lifetime, the system goes down or significant changes are made to the system and the system must be restarted.

5.3.2 SSDS Routine Operation Procedures

The SSDS is designed to operate continuously without any required adjustments or repairs beyond the routine maintenance items discussed below. No adjustments to the operating schedule or other intentional interruptions to operation (other than those required for routine maintenance) will be permitted without written approval by NYSDEC and NYSDOH.

The effectiveness of the SSDS components will be confirmed via monthly inspections for the first quarter after startup, and then quarterly system inspections will be conducted by personnel under the supervision of a QEP. These checks will consist of confirming that the blower is operating properly and taking induced vacuum readings at the three MPs. The inspection log will also document any unusual conditions (e.g., unusual odors, spills, leaks, excessive blower noise, etc.). A copy of the SSDS Inspection Log is provided in **Appendix I**.

Individual flow rate and vacuum readings will be recorded for each of the three SSDS pipe runs and sub-slab vacuum will be confirmed in each of the three VMPs. This operational data will be used as needed to adjust controls for individual branches, and any faulty gauges will be repaired or replaced as needed. SSDS inspections will be conducted on a quarterly basis, as shown in **Table VII**:

Table VII
SSDS System Inspection/Maintenance Schedule

Operations Monitoring Tasks	Frequency
SSDS Inspection and Monitoring	Monthly during first quarter post-startup and quarterly thereafter
System Component Maintenance	Quarterly and as necessary

Care will be taken during inspections to identify and repair any system malfunctions or problems (i.e., leaks, cracks, collection of condensation, etc.). Manufacturer's specifications, included in **Appendix J**, should be consulted prior to any repairs or adjustments that may become necessary.

If shutdown of the SSDS is considered, a proposal to discontinue the SSDS will be submitted by the property owner for NYSDEC and NYSDOH approval. The SSDS will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

5.3.3 SSDS Non-Routine Operation and Maintenance

In most instances, non-routine maintenance will be required due to operating conditions that are monitored by the SSDS alarm system. The primary objective of the alarm system is to notify personnel when operating conditions are likely to reduce or otherwise compromise SSDS efficiency. The telemetry alarm system will notify designated personnel (AKRF Project Manager, Deputy Project Manager, and building personnel) of the alarm condition via email and/or text message.

The alarm system will also notify the current owner's environmental professional when operating conditions are likely to cause damage to the SSDS equipment. The SSDS alarm will provide both an audible and visual notification for a low vacuum condition from each differential pressure switch. The audible alarm will be an 85 to 95 decibel horn or buzzer with a manual acknowledge off switch. An alarm condition may be indicative of damage to, or deterioration of, the SSDS pipes or blower. Damage to the individual SSDS lines may be noticeable only by interpreting unusually high or low vacuum readings or air flow rates, which will be noted in the routine system inspections and remedied upon identification.

5.3.4 SSDS Monitoring Devices and Alarms

The SSDS has a warning device to indicate that the system is not operating properly. In the event that the warning device alarm is activated, applicable maintenance and repairs will be conducted, as specified in the specifications and operations manuals included in **Appendix J**, and the SSDS will be restarted. Operational problems will be noted in the PRR to be prepared for that reporting period.

5.3.5 Fire Safety

The remedial party will conduct an annual facility walk with the local fire chief and/or fire suppression team. The site walk will allow for the addition of the facility to any local preplanning efforts. The NYSDEC project manager will be provided with the local fire chief's/fire suppression team's recommendations as soon as they become available. Following review, the NYSDEC project manager may direct the remedial party to implement the recommendations and/or revise the SMP.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

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

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or the Site's ECs to severe storms/weather events and associated flooding.

- Flood Plain: The Site is not located within a flood plain; however, the neighborhood periodically floods during heavy precipitation events due to overflow from the City sewer system. However, the SSDS blower and controls will be located on the building roof and would not be affected by flooding.
- Site Drainage and Storm Water Management: Stormwater at the Site and the surrounding area flows to the New York City combined sewer system.
- Erosion: A majority of the Site is covered with a concrete slab with a small landscaped area located within a central courtyard. Given the location of the landscaped area, erosion is not anticipated to be an issue of concern.
- High Wind: All permanent building components are secured against high winds. In the event that high winds are forecasted for the Site, proper precautions will be taken to secure or shelter any Site components that are not protected against high winds.
- Electricity: Electricity to the building is supplied via newly installed underground vaults and conduits and is not expected to be affected by severe weather events.
- Spill/Contaminant Release: Storage of large amounts of fuel oil or other chemicals at the Site is not expected. Nominal amounts of cleaning chemicals are likely to be stored throughout the Site but are not expected to be affected by severe weather conditions.
- Wildfires: The Site is located in an urban area and there is no risk associated with wildfires.

6.2 Soil Vapor Intrusion Evaluation

In the event that the Site building (currently under construction) is modified in the future and subsurface disturbance is required, or if additional buildings are constructed, an SVIE will be conducted in coordination with NYSDEC and NYSDOH.

6.3 Green Remediation Evaluation

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

6.3.1 Timing of Green Mitigation Evaluations

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

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

6.3.2 Mitigation Systems

Mitigation systems will be operated properly considering the current site conditions to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates and use of reagents and consumables. Spent materials will be sent for recycling, as appropriate. The SSDS motor will be adjusted using the VFD to minimize energy usage if feasible based on operating conditions.

6.3.3 Building Operations

Structures, including buildings and sheds, will be operated and maintained to provide for the most efficient operation of the remedy, while minimizing energy, waste generation, and water consumption.

6.3.4 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site, use of consumables in relation to visiting the Site in order to conduct system checks and/or collect samples, and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities has been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy and resources.

6.3.5 Metrics and Reporting

As discussed in Section 7.0 and as shown in **Appendix L,** information on energy usage, solid waste generation, transportation and shipping, water usage, and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits. A set of metrics has been developed.

6.4 Mitigation System Optimization

A Mitigation System Optimization (MSO) study will be conducted any time that the NYSDEC project manager or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An MSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the mitigation system is exceeding the estimated costs;
- The mitigation system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;

- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

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

The MSO study will focus on overall site cleanup strategy, process optimization, and management with the intent of identifying impediments to cleanup and improvements to Site operations to increase efficiency, cost effectiveness, and remedial time frames. Green remediation technology and principals are to be considered when performing the MSO. The MSO table of contents is provided in **Appendix K**.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

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

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of **Table VIII,** and summarized in the PRR.

Table VIII
Schedule of Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Monitoring/Inspection Letter Report with Figures and Attachments (Inspections and Associated Sampling Events)	Quarterly for first PRR cycle and annually thereafter.
Periodic Review Report (Inclusive of All Inspections and Sampling Events)	Annually. First inspection no more than 16 months after COC, then at least annually thereafter, and PRR due 1 month later.

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

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

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

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

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

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

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

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

7.2 Periodic Review Report (PRR)

An initial PRR will be submitted to the NYSDEC project manager beginning sixteen (16) months after the COC is issued. After submittal of the initial PRR, the next PRR shall be submitted annually to the NYSDEC project manager or at another frequency as may be required by the NYSDEC project manager. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site described in **Appendix A** – Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the PRR. The report will include:

- Identification, assessment, and certification of all ECs/ICs required by the remedy for the Site.
- Results of the required annual site inspections, fire inspections, and severe condition inspections, if applicable.
- Description of any change of use, import of materials, or excavation that occurred during the certifying period.
- All applicable site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- Identification of any wastes generated during the reporting period, along with waste characterization data, manifests, and disposal documentation.

- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), including a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These tables and figures will include a presentation of past data as part of an evaluation of contaminant concentration trends, including but not limited to:
  - Trend monitoring graphs that present groundwater contaminant levels from before the start of the remedy implementation to the most current sampling data;
  - Trend monitoring graphs depicting system influent analytical data on a per event and cumulative basis;
  - Operation and Maintenance data summary tables;
  - A current plume map for sites with remaining groundwater contamination; and
  - A groundwater elevation contour map for each gauging event.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the Site-specific RAWP and Decision Document;
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
  - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan;
  - An evaluation of trends in contaminant levels in the affected media to determine if the remedy continues to be effective in achieving remedial goals as specified by the RAWP and Decision Document; and
  - The overall performance and effectiveness of the remedy.
- A performance summary for all treatment systems at the Site during the calendar year, including information such as:
  - The number of days the system operated for the reporting period;
  - The average, high, and low flows per day;
  - The contaminant mass removed and the cost per pound of mass removed during the certification period and during the life of the treatment system;
  - A description of breakdowns and/or repairs along with an explanation for any significant downtime;

  - A description of the resolution of performance problems;
  - Alarm conditions;
  - Trends in equipment failure;
  - A summary of the performance, effluent and/or effectiveness monitoring; and
  - Comments, conclusions, and recommendations based on data evaluation. Recommendations must address how receptors would be impacted. Recommendations can include:
    - Proposals to address efficiency and costs such as: instituting remote operation, system changes to decrease maintenance costs and downtime, and system changes to decrease energy use; and
    - Proposals to modify or shut down a treatment system due to remediation completion, system performance or changed conditions. System shutdowns are addressed in Section 6.4 of DER-10.

For sites whose remedial programs are State-funded, a quantitative and qualitative overview of a site's environmental impacts must be provided through the completion of the Summary of Green Remediation Metrics provided in **Appendix L.** This form, as well as a summary of the Green Remediation evaluation, will be included in the PRR.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a QEP as defined in 6 NYCRR Part 375 or a P.E. licensed to practice and registered in New York State will prepare, and include in the PRR, the following certification as per the requirements of NYSDEC DER-10:

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

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*

- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices];*
- *The information presented in this report is accurate and complete;*
- *The assumptions made in the qualitative exposure assessment remain valid; and*
- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Rebecca Kinal, of AKRF, Inc., am certifying as Owner's/Remedial Party's Designated Site Representative.

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

The signed certification will be included in the Periodic Review Report. The Periodic Review Report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager. The Periodic Review Report may also need to be submitted in hard-copy format if requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

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

7.4 Mitigation System Optimization Report

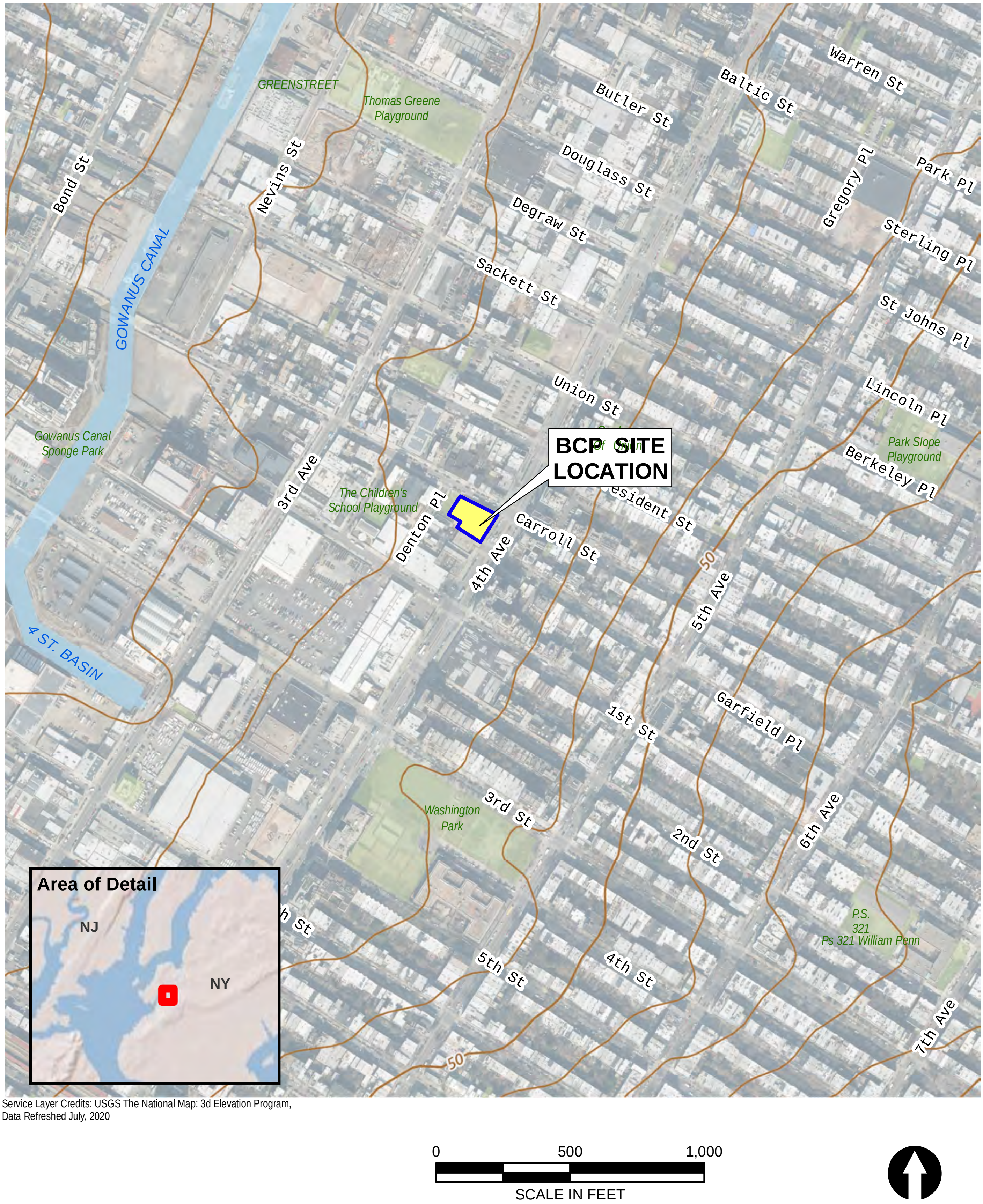
If an MSO is to be performed (see Section 6.4), upon completion of an MSO, an MSO report must be submitted to the NYSDEC project manager for approval. A general outline for the MSO report is provided in **Appendix K**. The MSO report will document the research/investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model, and present recommendations. MSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs, etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A Final Engineering Report and update to the SMP may also be required.

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

8.0 REFERENCES

1. 6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.
2. NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".
3. NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).
4. Phase I Environmental Site Assessment, 272 4th Avenue, Brooklyn, New York, AKRF, April 2019
5. Phase I Environmental Site Assessment, 274 4th Avenue and 538 Carroll Street, Brooklyn, New York, AKRF, April 2021
6. Remedial Investigation Report, 272 4th Avenue, Brooklyn, New York, AKRF, June 2022
7. Remedial Action Work Plan, 272 4th Avenue, Brooklyn, New York, AKRF, July 2022
8. Remedial Action Work Plan: Minor Modification, 272 4th Avenue, Brooklyn, New York, AKRF, April 2023
9. Remedial Action Work Plan: Minor Modification, 272 4th Avenue, Brooklyn, New York, AKRF, November 2023
10. Revised Groundwater Treatment Design, 272 4th Avenue, Brooklyn, New York, AKRF, November 2023

FIGURES



Service Layer Credits: USGS The National Map: 3d Elevation Program,
Data Refreshed July, 2020

AKRF
440 Park Avenue South, New York, NY 10016

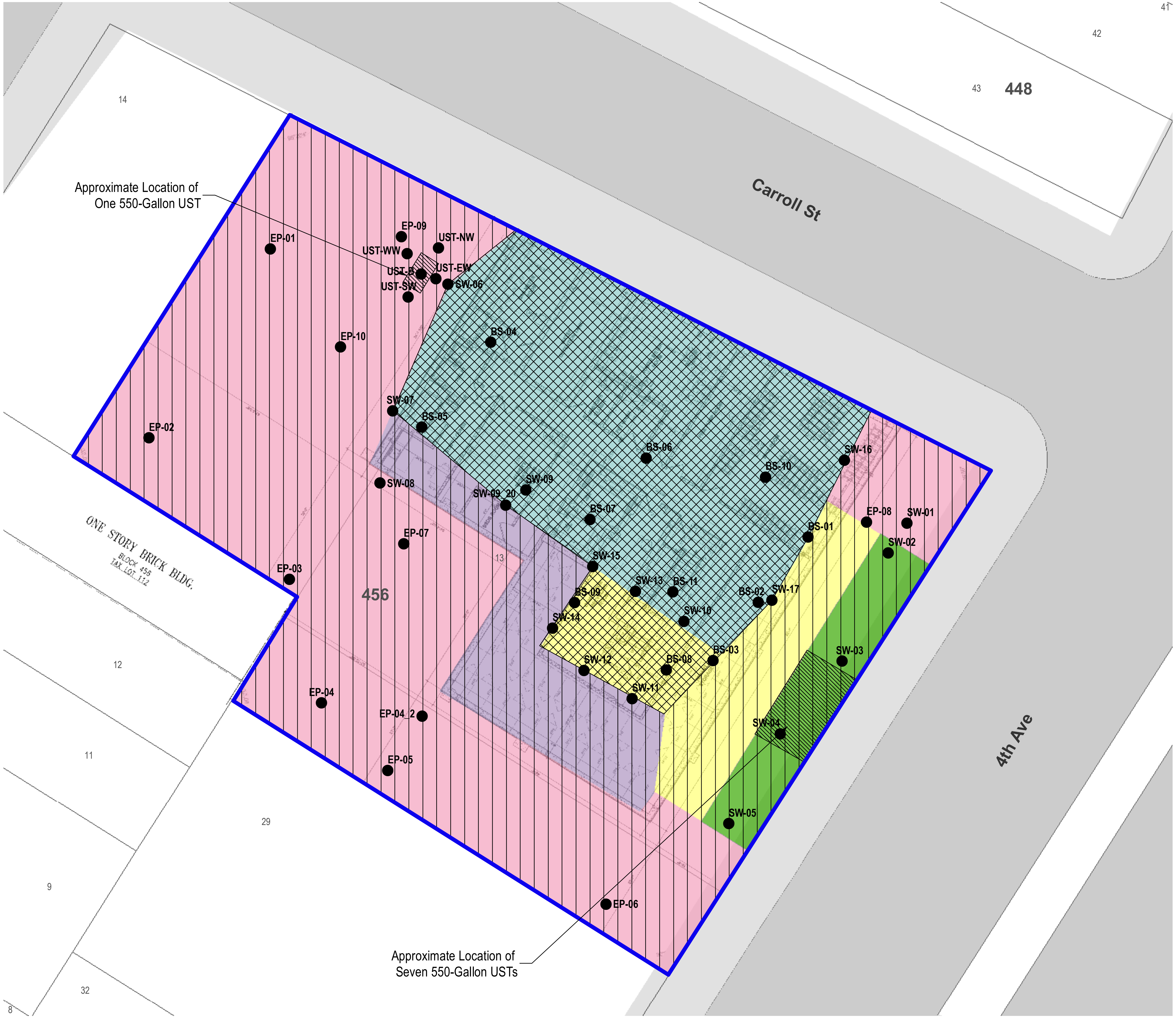
272 4th Ave
Brooklyn, New York

SITE LOCATION

DATE
2/23/2024

PROJECT NO.
190021

FIGURE
1



N

STATE OF NEW YORK
REBECCA A. KINAL
082046-1
LICENSED PROFESSIONAL ENGINEER

LEGEND

▭	BCP SITE AND IC BOUNDARY
20	LOT BOUNDARY AND TAX LOT
456	BLOCK NUMBER
▩	TRACK 2
▥	TRACK 4
🟪	SLOPED REMEDIAL EXCAVATION (SOE) BETWEEN 2 AND13 FEET BELOW INTIAL GRADE
🟥	REMEDIAL EXCAVATION TO 2 FEET BELOW INITIAL GRADE
🟦	EXCAVATION TO BETWEEN 13 AND 17 FEET BELOW GRADE FOR PARTIAL CELLAR AND ELEVATOR PIT
🟩	GROUNDWATER TREATMENT SECTION A:EXCAVATION TO APPROXIMATELY 10 TO 13 FEET BELOW SIDEWALK GRADE TO EXTENT ALLOWED BY MTA
🟨	GROUNDWATER TREATMENT SECTION B: EXCAVATION TO BETWEEN 12 AND 15 FEET BELOW GRADE FOR SOURCE AREA REMOVAL
●	ENDPOINT SAMPLE LOCATIONS

IC = INSTITUTIONAL CONTROL

0 10 20 40

SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

Backround Source:
Based on Figure A-100, CELLAR FLOOR PLAN,
Prepared by L+Z Architecture, DPC
101 Ivy Lane, Tenafly, New Jersey
August 2022

AKRF
440 Park Avenue South, New York, NY 10016

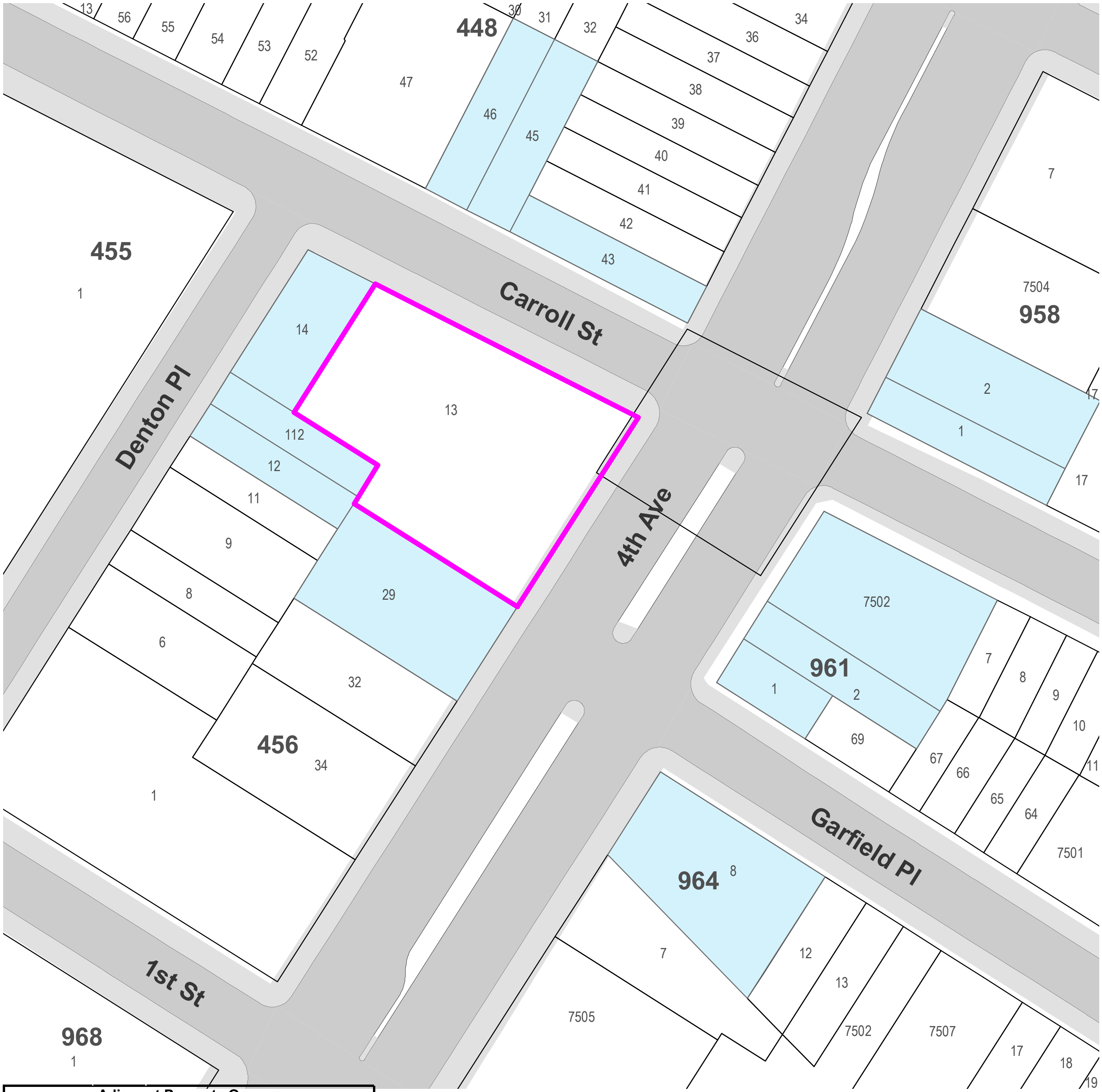
SITE PLAN SHOWING BCP BOUNDARY, SITE LAYOUT AND SAMPLING LOCATIONS

272 4th Ave
Brooklyn, New York

DATE
9/20/2024

PROJECT NO.
190021

FIGURE
2



Adjacent Property Owners		
Block	**Lot**	**OwnerName**
456	29	New York City Transit Authority
456	14	New Garden Trust Inc.
456	12	NJK denton Llc
961	1	261 4Th Avenue, Llc
964	8	First Building Enterp.
448	46	555 Gates, LLC
448	45	529 Carroll Owners Corp
448	43	First Building Enterp.
958	1	Gregan Management, Inc.
958	2	249-251 4Th Avenue Pr
961	2	Jaman Realty, Llc
961	3	560 Carroll Street
456	112	9 Denton Place

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

LEGEND

▭ PROJECT SITE BOUNDARY

▭ ADJACENT PROPERTIES

23 LOT BOUNDARY AND TAX LOT NUMBER

456 Block Number

N

0 80 160

SCALE IN FEET

AKRF

440 Park Avenue South, New York, NY 10016

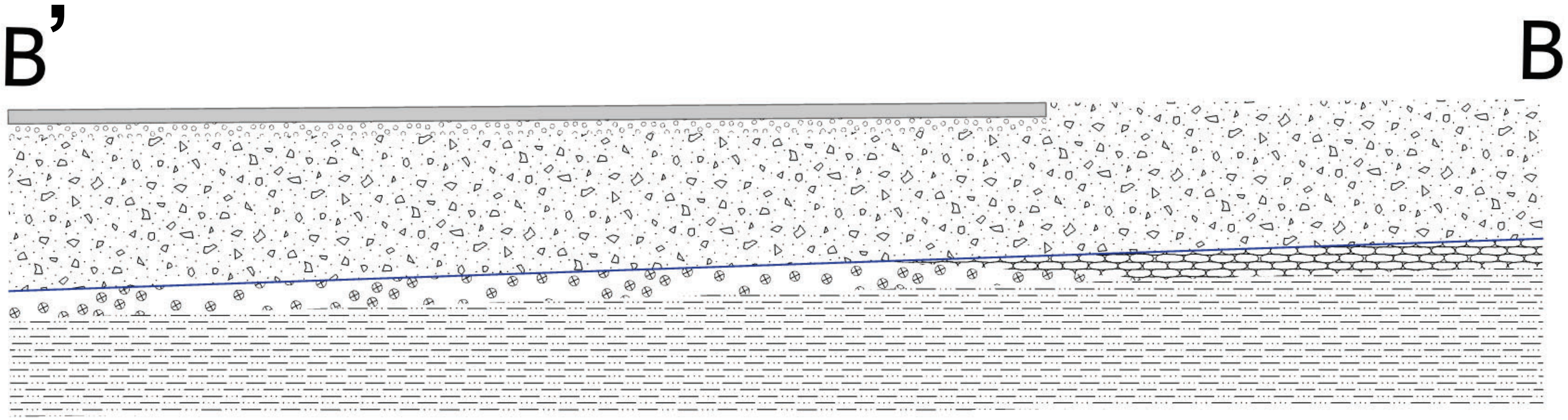
272 4th Ave
Brooklyn, New York

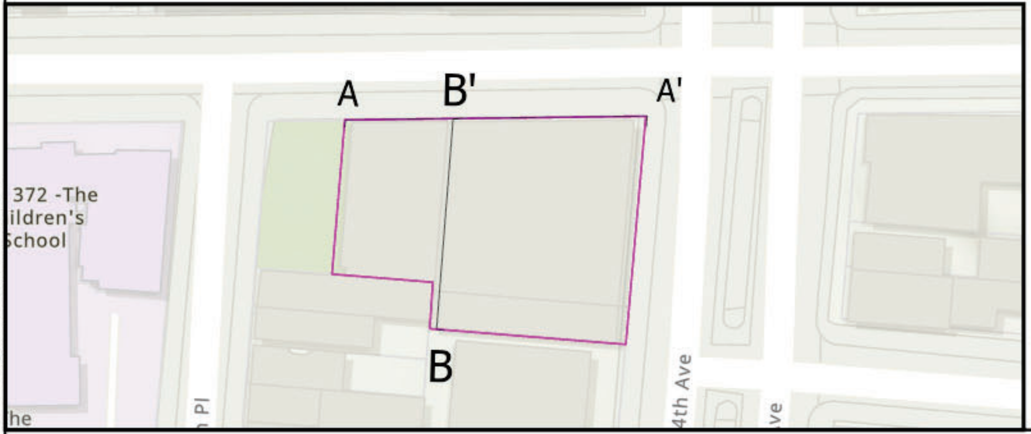
TAX MAP

DATE
9/19/2024

PROJECT NO.
190021

FIGURE
3





Service Layer Credits: USGS The National Map: 3d Elevation Program, Data Refreshed July, 2021

Legend

- Clean Backfill
- Fill
- Silt
- Slab
- Gas Permeable Aggregate
- Gravel
- Clean fill
- Demarcation Barrier

0 10 20
SCALE IN FEET

STATE OF NEW YORK
REBECCA A. KINAL
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LICENSED PROFESSIONAL ENGINEER

AKRF
440 Park Avenue South, New York, NY 10016

272 4th Ave
Brooklyn, New York

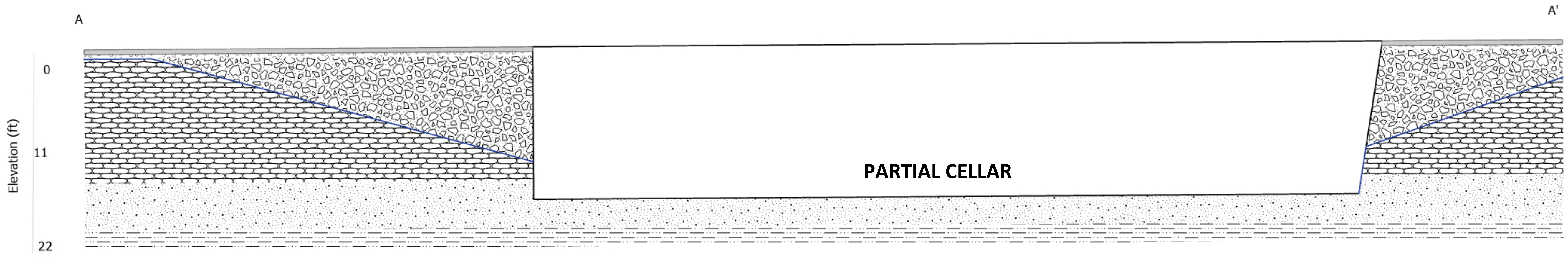
Geologic Cross Section - North-South

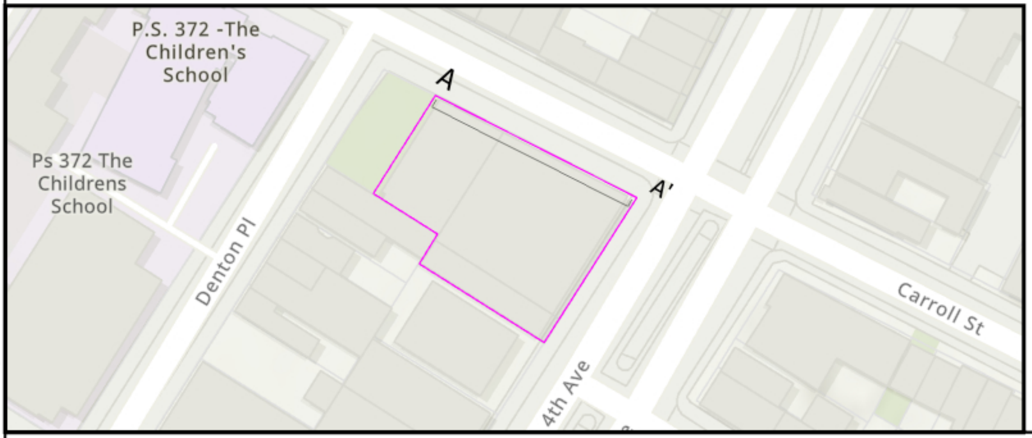
DATE
12/20/2024

PROJECT NO.
190021

FIGURE
4A

AKRF O:\Projects\190021 - 272 4TH AVENUE\Technical\Geospatial\SAR\190021_XSec_4B.aprx12/20/2024 12:08 PM230346 Fig 1 site location1dcolombini





Service Layer Credits: USGS The National Map: 3d Elevation Program, Data Refreshed July, 2021

Legend

- Clean Backfill
- Fill
- Partial Cellar
- Sand AND Gravel
- Silt
- Slab
- Gas Permeable Aggregate
- Demarcation Barrier

0 12 24
SCALE IN FEET

N

STATE OF NEW YORK
REBECCA A. KINAL
082046-1
LICENSED PROFESSIONAL ENGINEER

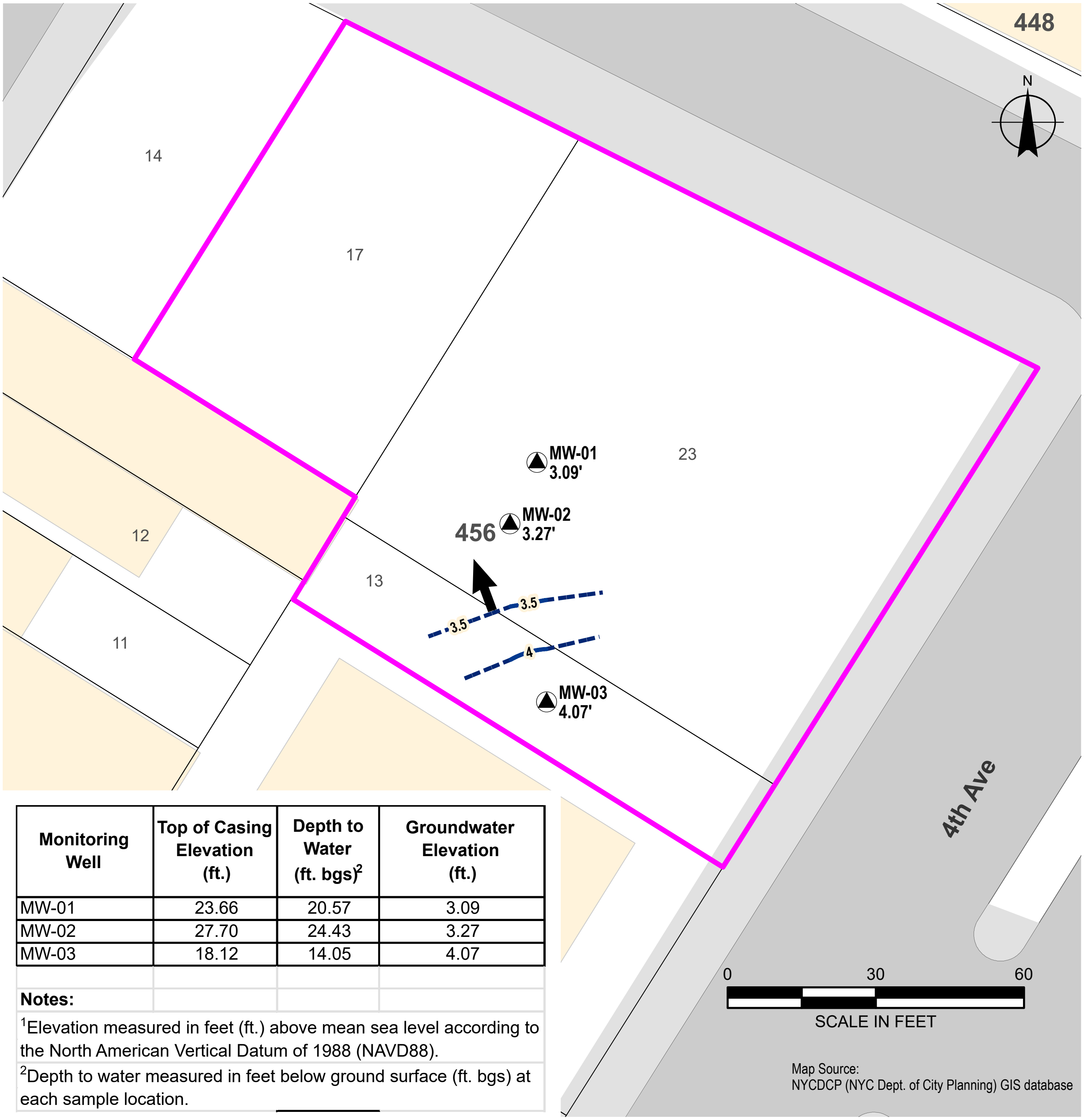
AKRF
440 Park Avenue South, New York, NY 10016

272 4th Ave
Brooklyn, New York

Geologic Cross Section - East-West

DATE
12/12/2024
PROJECT NO.
190021
FIGURE
4B

AKRF C:\Users\dcolombini\Documents\ArcGIS\Projects\190021\Xsec_190021\Xsec_190021.aprx12/12/2024 6:32 PM230346 Fig 1 site locationdcolombini



Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

Monitoring Well	Top of Casing Elevation (ft.)	Depth to Water (ft. bgs)[2]	Groundwater Elevation (ft.)
MW-01	23.66	20.57	3.09
MW-02	27.70	24.43	3.27
MW-03	18.12	14.05	4.07

Notes:

[1] Elevation measured in feet (ft.) above mean sea level according to the North American Vertical Datum of 1988 (NAVD88).

[2] Depth to water measured in feet below ground surface (ft. bgs) at each sample location.

LEGEND

▭	PROJECT SITE BOUNDARY	▲	POST REMEDIATION MONITORING WELL LOCATION
23	LOT BOUNDARY AND TAX LOT NUMBER	- - -	INFERRED GROUNDWATER ELEVATION CONTOUR
456	BLOCK NUMBER	—	KNOWN GROUNDWATER ELEVATION CONTOUR
▨	BUILDING	↖	GENERALIZED GROUNDWATER FLOW DIRECTION

REBECCA A. KINAL
082046-1

AKRF
440 Park Avenue South, New York, NY 10016

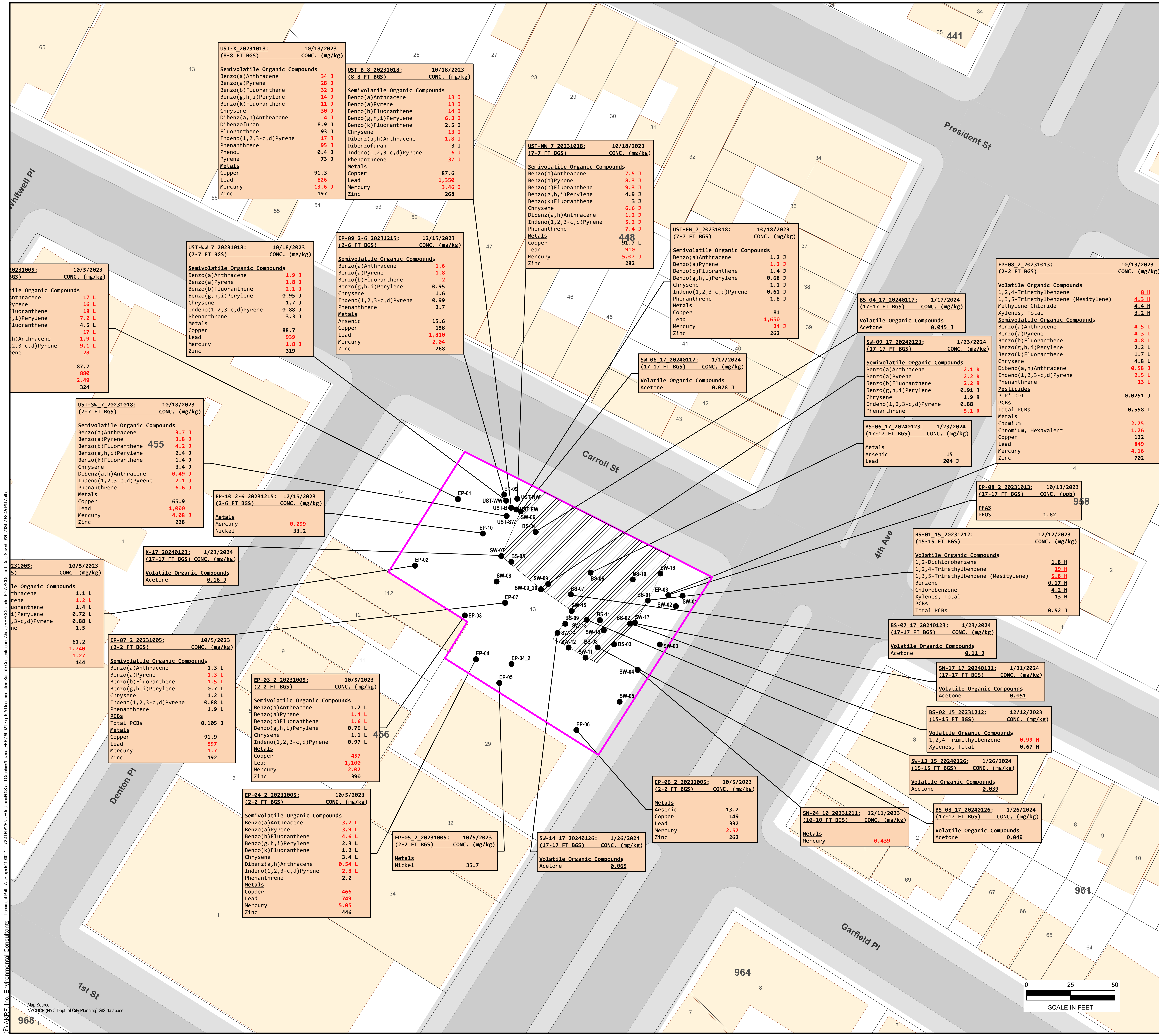
272 4th Ave
Brooklyn, New York

GROUNDWATER ELEVATION CONTOURS

DATE
6/30/2024

PROJECT NO.
190021

FIGURE
5



Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

UST-X_20231018:	10/18/2023
(8-8 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	34 J
Benzo(a)Pyrene	28 J
Benzo(b)Fluoranthene	32 J
Benzo(g,h,i)Perylene	14 J
Benzo(k)Fluoranthene	11 J
Chrysene	30 J
Dibenz(a,h)Anthracene	4 J
Dibenzofuran	8.9 J
Fluoranthene	93 J
Indeno(1,2,3-c,d)Pyrene	17 J
Phenanthrene	95 J
Phenol	0.4 J
Pyrene	73 J
Metals	
Copper	91.3
Lead	826
Mercury	13.6 J
Zinc	197

UST-B_8_20231018:	10/18/2023
(8-8 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	13 J
Benzo(a)Pyrene	13 J
Benzo(b)Fluoranthene	14 J
Benzo(g,h,i)Perylene	6.3 J
Benzo(k)Fluoranthene	2.5 J
Chrysene	13 J
Dibenz(a,h)Anthracene	1.8 J
Dibenzofuran	3 J
Indeno(1,2,3-c,d)Pyrene	6 J
Phenanthrene	37 J
Metals	
Copper	87.6
Lead	1,350
Mercury	3.46 J
Zinc	268

UST-NW_7_20231018:	10/18/2023
(7-7 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	7.5 J
Benzo(a)Pyrene	8.3 J
Benzo(b)Fluoranthene	9.3 J
Benzo(g,h,i)Perylene	4.9 J
Benzo(k)Fluoranthene	3 J
Chrysene	6.6 J
Dibenz(a,h)Anthracene	1.2 J
Indeno(1,2,3-c,d)Pyrene	5.2 J
Phenanthrene	7.4 J
Metals	
Copper	91.7 L
Lead	910
Mercury	5.07 J
Zinc	282

20231005:	10/5/2023
BGS)	CONC. (mg/kg)
tile Organic Compounds	
Anthracene	17 L
Pyrene	16 L
Fluoranthene	18 L
,i)Perylene	7.2 L
Fluoranthene	4.5 L
	17 L
h)Anthracene	1.9 L
,2,3-c,d)Pyrene	9.1 L
ene	28
	87.7
	880
	2.49
	324

UST-WW_7_20231018:	10/18/2023
(7-7 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	1.9 J
Benzo(a)Pyrene	1.8 J
Benzo(b)Fluoranthene	2.1 J
Benzo(g,h,i)Perylene	0.95 J
Chrysene	1.7 J
Indeno(1,2,3-c,d)Pyrene	0.88 J
Phenanthrene	3.3 J
Metals	
Copper	88.7
Lead	939
Mercury	1.8 J
Zinc	319

EP-09_2-6_20231215:	12/15/2023
(2-6 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	1.6
Benzo(a)Pyrene	1.8
Benzo(b)Fluoranthene	2
Benzo(g,h,i)Perylene	0.95
Chrysene	1.6
Indeno(1,2,3-c,d)Pyrene	0.99
Phenanthrene	2.7
Metals	
Arsenic	15.6
Copper	158
Lead	1,810
Mercury	2.04
Zinc	268

UST-EW_7_20231018:	10/18/2023
(7-7 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	1.2 J
Benzo(a)Pyrene	1.2 J
Benzo(b)Fluoranthene	1.4 J
Benzo(g,h,i)Perylene	0.68 J
Chrysene	1.1 J
Indeno(1,2,3-c,d)Pyrene	0.61 J
Phenanthrene	1.8 J
Metals	
Copper	81
Lead	1,650
Mercury	24 J
Zinc	262

BS-04_17_20240117:	1/17/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.045 J

EP-08_2_20231013:	10/13/2023
(2-2 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	8 H
1,3,5-Trimethylbenzene (Mesitylene)	4.3 H
Methylene Chloride	4.4 H
Xylenes, Total	3.2 H
Semivolatile Organic Compounds	
Benzo(a)Anthracene	4.5 L
Benzo(a)Pyrene	4.3 L
Benzo(b)Fluoranthene	4.8 L
Benzo(g,h,i)Perylene	2.2 L
Benzo(k)Fluoranthene	1.7 L
Chrysene	4.8 L
Dibenz(a,h)Anthracene	0.58 J
Indeno(1,2,3-c,d)Pyrene	2.5 L
Phenanthrene	13 L
Pesticides	
P,P'-DDT	0.0251 J
PCBs	
Total PCBs	0.558 L
Metals	
Cadmium	2.75
Chromium, Hexavalent	1.26
Copper	122
Lead	849
Mercury	4.16
Zinc	702

SW-09_17_20240123:	1/23/2024
(17-17 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	2.1 R
Benzo(a)Pyrene	2.2 R
Benzo(b)Fluoranthene	2.2 R
Benzo(g,h,i)Perylene	0.91 J
Chrysene	1.9 R
Indeno(1,2,3-c,d)Pyrene	0.88
Phenanthrene	5.1 R

SW-06_17_20240117:	1/17/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.078 J

UST-SW_7_20231018:	10/18/2023
(7-7 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	3.7 J
Benzo(a)Pyrene	3.8 J
Benzo(b)Fluoranthene	4.2 J
Benzo(g,h,i)Perylene	2.4 J
Benzo(k)Fluoranthene	1.4 J
Chrysene	3.4 J
Dibenz(a,h)Anthracene	0.49 J
Indeno(1,2,3-c,d)Pyrene	2.1 J
Phenanthrene	6.6 J
Metals	
Copper	65.9
Lead	1,000
Mercury	4.08 J
Zinc	228

BS-06_17_20240123:	1/23/2024
(17-17 FT BGS)	CONC. (mg/kg)
Metals	
Arsenic	15
Lead	204 J

EP-10_2-6_20231215:	12/15/2023
(2-6 FT BGS)	CONC. (mg/kg)
Metals	
Mercury	0.299
Nickel	33.2

EP-08_2_20231013:	10/13/2023
(17-17 FT BGS)	CONC. (ppb)
PFAS	
PFOS	1.82

BS-01_15_20231212:	12/12/2023
(15-15 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
1,2-Dichlorobenzene	1.8 H
1,2,4-Trimethylbenzene	19 H
1,3,5-Trimethylbenzene (Mesitylene)	5.8 H
Benzene	0.17 H
Chlorobenzene	4.2 H
Xylenes, Total	13 H
PCBs	
Total PCBs	0.52 J

X-17_20240123:	1/23/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.16 J

231005:	10/5/2023
S)	CONC. (mg/kg)
le Organic Compounds	
thracene	1.1 L
rene	1.2 L
uoranthene	1.4 L
i)Perylene	0.72 L
,3-c,d)Pyrene	0.88 L
ne	1.5
	61.2
	1,740
	1.27
	144

EP-07_2_20231005:	10/5/2023
(2-2 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	1.3 L
Benzo(a)Pyrene	1.3 L
Benzo(b)Fluoranthene	1.5 L
Benzo(g,h,i)Perylene	0.7 L
Chrysene	1.2 L
Indeno(1,2,3-c,d)Pyrene	0.88 L
Phenanthrene	1.9 L
PCBs	
Total PCBs	0.105 J
Metals	
Copper	91.9
Lead	597
Mercury	1.7
Zinc	192

EP-03_2_20231005:	10/5/2023
(2-2 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	1.2 L
Benzo(a)Pyrene	1.4 L
Benzo(b)Fluoranthene	1.6 L
Benzo(g,h,i)Perylene	0.76 L
Chrysene	1.1 L
Indeno(1,2,3-c,d)Pyrene	0.97 L
Metals	
Copper	457
Lead	1,100
Mercury	2.02
Zinc	390

BS-07_17_20240123:	1/23/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.11 J

SW-17_17_20240131:	1/31/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.051

BS-02_15_20231212:	12/12/2023
(15-15 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.99 H
Xylenes, Total	0.67 H

SW-13_15_20240126:	1/26/2024
(15-15 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.039

EP-04_2_20231005:	10/5/2023
(2-2 FT BGS)	CONC. (mg/kg)
Semivolatile Organic Compounds	
Benzo(a)Anthracene	3.7 L
Benzo(a)Pyrene	3.9 L
Benzo(b)Fluoranthene	4.6 L
Benzo(g,h,i)Perylene	2.3 L
Benzo(k)Fluoranthene	1.2 L
Chrysene	3.4 L
Dibenz(a,h)Anthracene	0.54 L
Indeno(1,2,3-c,d)Pyrene	2.8 L
Phenanthrene	2.2
Metals	
Copper	466
Lead	749
Mercury	5.05
Zinc	446

EP-06_2_20231005:	10/5/2023
(2-2 FT BGS)	CONC. (mg/kg)
Metals	
Arsenic	13.2
Copper	149
Lead	332
Mercury	2.57
Zinc	262

SW-04_10_20231211:	12/11/2023
(10-10 FT BGS)	CONC. (mg/kg)
Metals	
Mercury	0.439

BS-08_17_20240126:	1/26/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.049

EP-05_2_20231005:	10/5/2023
(2-2 FT BGS)	CONC. (mg/kg)
Metals	
Nickel	35.7

SW-14_17_20240126:	1/26/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.065

LEGEND

N

▭	BCP SITE BOUNDARY
20	LOT BOUNDARY
456	BLOCK NUMBER
▭	BUILDING
▨	TRACK 2
●	ENDPOINT SAMPLE LOCATION

Part 375 Soil Cleanup Objectives (SCOs): SCOs listed in the New York State Department of Environmental Conservation (NYSDEC) "Part 375" Regulations (6 NYCRR Part 375).

Exceedances of NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs) are presented in bold font.

Exceedances of NYSDEC Restricted Residential Soil Cleanup Objectives(RRSCOs) are presented in red.

Exceedances of NYSDEC Protected Groundwater Soil Cleanup Objectives (PGWSCOs) for VOCs are presented in underlined font.

mg/kg:milligrams per kilogram = parts per million (ppm)

J: The reported value is estimated
L: Sample result is estimated and biased low.
H: Sample result is estimated and biased high.
R: Indicates the reported result is unusable. (note: the analyte may or may not be present.)

UST-X_20231018 is a blind duplicate of sample UST-B_8_20231018
X-17_20240123 is a blind duplicate of sample SW-07_17_20240117

Sample ID — Sample Date

BS-07_17_20240123:	1/23/2024
(17-17 FT BGS)	CONC. (mg/kg)
Volatile Organic Compounds	
Acetone	0.11 J

Analyte/Compound — Concentration

	PART 375 PROTECTION OF GROUNDWATER mg/kg	PART 375 RESTRICTED RESIDENTIAL mg/kg	PART 375 UNRESTRICTED mg/kg
Volatile Organic Compounds			
1,2,4-Trimethylbenzene	5.9	0.52	0.51
1,2-Dichlorobenzene	1.1	100	1.1
1,3,5-Trimethylbenzene (Mesitylene)	3.1	0.52	0.51
Acetone	0.03	100	0.03
Benzene	0.06	3.7	0.06
Chlorobenzene	1.1	100	1.1
Methylene Chloride	0.05	81	0.05
Xylenes, Total	1.2	100	0.26
Semivolatile Organic Compounds			
Benzo(a)Anthracene	NA	1.4	1
Benzo(a)Pyrene	NA	1	1
Benzo(b)Fluoranthene	NA	1.4	1
Benzo(g,h,i)Perylene	NA	4.9	0.64
Benzo(k)Fluoranthene	NA	4.9	0.8
Chrysene	NA	4.9	1
Dibenz(a,h)Anthracene	NA	0.33	0.33
Dibenzofuran	NA	18	2.1
Fluoranthene	NA	100	85
Indeno(1,2,3-c,d)Pyrene	NA	1.4	0.5
Phenanthrene	NA	4.9	1.1
Phenol	NA	100	0.33
Pyrene	NA	100	64
Metals			
Arsenic	NA	16	13
Cadmium	NA	2.5	2.5
Chromium, Hexavalent	NA	1	1
Copper	NA	280	50
Lead	NA	400	63
Mercury	NA	0.26	0.18
Nickel	NA	210	30
Zinc	NA	6,600	109
PCBs			
Total PCBs	NA	1	0.1
Pesticides			
P,P'-DDT	NA	3.8	0.0033

	PFAS GUIDANCE VALUES Restricted Residential Use ppb	PFAS GUIDANCE VALUES Unrestricted Use ppb
PFAS		
Perfluorooctanesulfonic acid (PFOS)	44	0.88
Perfluorooctanoic acid (PFOA)	33	0.66

REBECCA A. KINAL
082046-1

AKRF
440 Park Avenue South, New York, NY 10016

272 4th Avenue
Brooklyn, New York

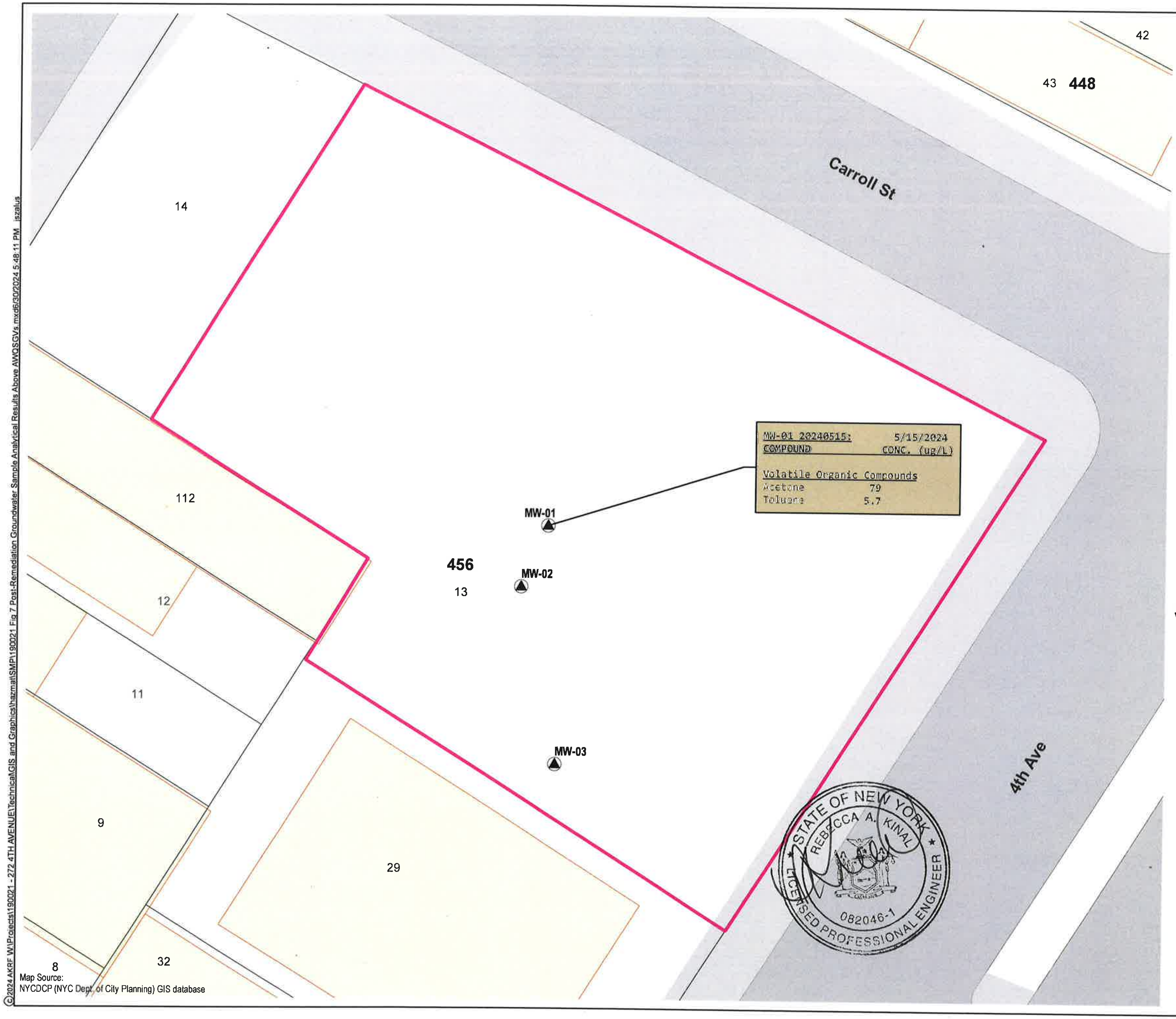
Documentation Sample Concentrations Above RRSCOs and/or PGWSCOs

DATE
9/20/2024

PROJECT NO.
190021

FIGURE
6

© AKRF, Inc. Environmental Consultants Fig 10A Documentation Sample Concentrations Above RRSCOs andor PGWSCOs.mxd Date Saved: 9/20/2024 2:58:45 PM Author:



MW-01_20240515:	5/15/2024
COMPOUND	CONC. (ug/L)
Volatile Organic Compounds	
Acetone	79
Toluene	5.7

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

©2024 AKRF W:\Projects\190021 - 272 4TH AVENUE\Technical\GIS and Graphics\hazmat\SMP\190021 Fig 7 Post-Remediation Groundwater Sample Analytical Results Above AWQSGVs.mxd6/30/2024 5:48:11 PM iszalus

Rebecca A. Kinal
082046-1
Licensed Professional Engineer

N

LEGEND

▭ BCP SITE BOUNDARY

23 LOT BOUNDARY AND TAX LOT NUMBER

456 BLOCK NUMBER

▭ BUILDING 20230201

▲ POST-REMEDIATION MONITORING WELL

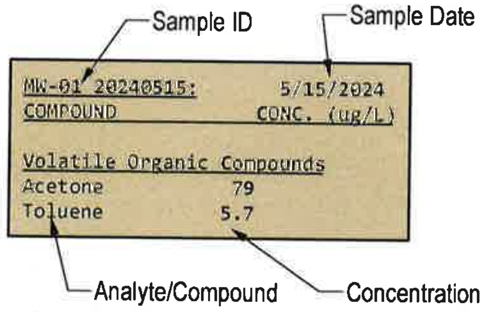
NYSDEC TOGS Class GA Ambient Water Quality Standard and Guidance Values (AWQSGVs):
New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) (1.1.1):

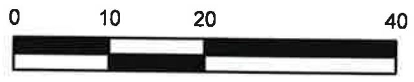
µg/L: micrograms per Liter = parts per billion (ppb)

Only Exceedances of NYSDEC AWQSGVs are shown in bold font.

MW-X_20240510 is a blind duplicate of sample MW-03_20240510

	NYSDEC AWQSGVs ug/l
Volatile Organic Compounds	
Acetone	50
Toluene	5





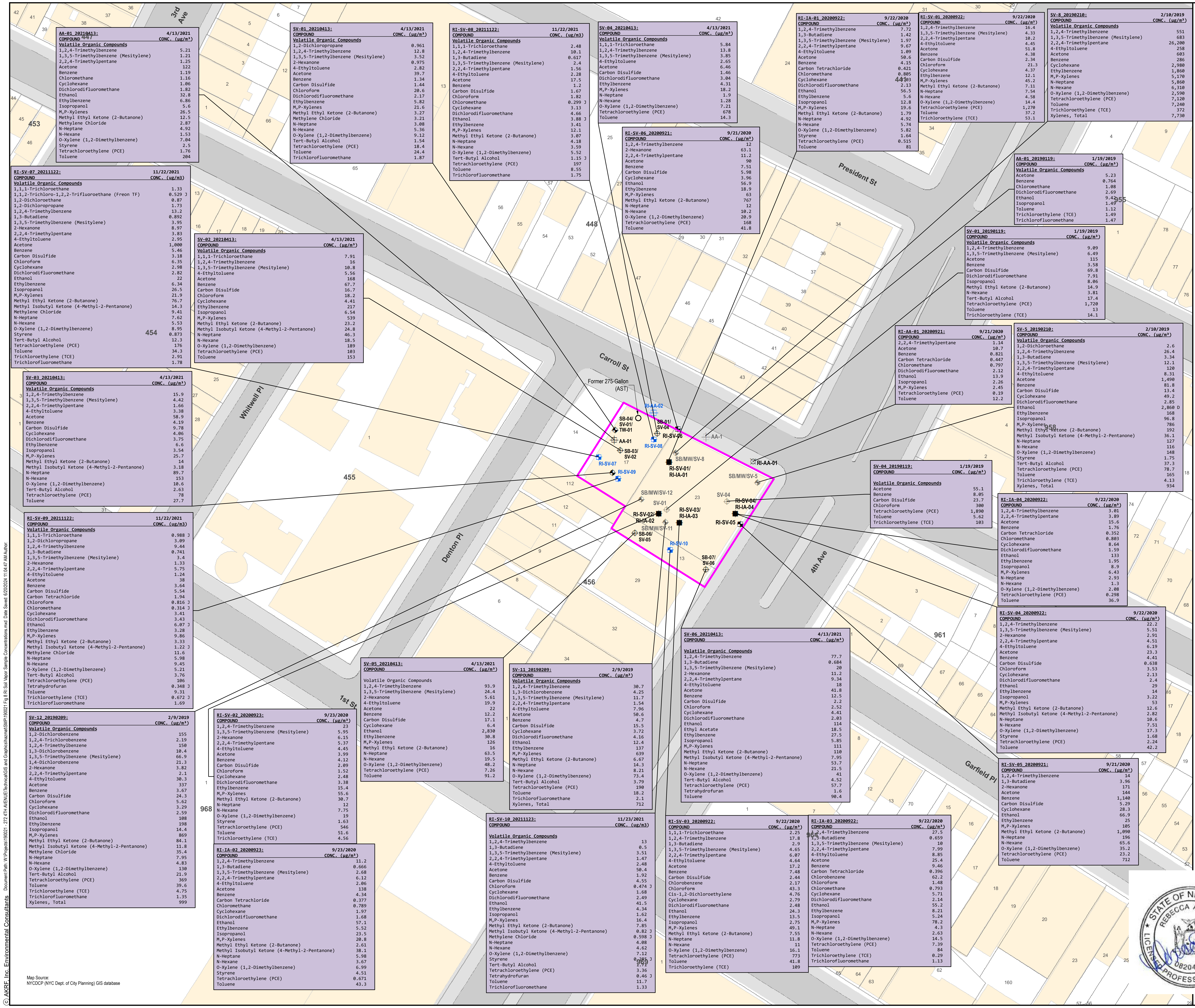
SCALE IN FEET

AKRF
440 Park Avenue South, New York, NY 10016

POST-REMEDIATION GROUNDWATER SAMPLE ANALYTICAL RESULTS ABOVE AWQSGVs

272 4th Ave
Brooklyn, New York

DATE
6/30/2024
PROJECT NO.
190021
FIGURE
7



AA-01_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	5.21
1,3,5-Trimethylbenzene (Mesitylene)	1.21
2,2,4-Trimethylpentane	1.25
Acetone	122
Benzene	1.19
Chloromethane	1.16
Cyclohexane	1.06
Dichlorodifluoromethane	1.82
Ethanol	32.8
Ethylbenzene	6.86
Isopropanol	5.6
M,P-Xylenes	26.5
Methyl Ethyl Ketone (2-Butanone)	12.5
Methylene Chloride	2.87
N-Heptane	4.92
N-Hexane	1.53
O-Xylene (1,2-Dimethylbenzene)	7.04
Styrene	2.5
Tetrachloroethylene (PCE)	1.76
Toluene	204

SV-01_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2-Dichloropropane	0.961
1,2,4-Trimethylbenzene	12.8
1,3,5-Trimethylbenzene (Mesitylene)	3.52
2-Hexanone	0.975
4-Ethyltoluene	2.82
Acetone	39.7
Benzene	1.34
Carbon Disulfide	1.44
Chloroform	20.6
Dichlorodifluoromethane	2.17
Ethylbenzene	5.82
M,P-Xylenes	21.6
Methyl Ethyl Ketone (2-Butanone)	3.27
Methylene Chloride	3.21
N-Heptane	3.08
N-Hexane	5.36
O-Xylene (1,2-Dimethylbenzene)	9.12
Tert-Butyl Alcohol	1.54
Tetrachloroethylene (PCE)	18.4
Toluene	24.4
Trichlorofluoromethane	1.87

RI-SV-08_20211122:	11/22/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,1-Trichloroethane	2.48
1,2,4-Trimethylbenzene	10.1
1,3-Butadiene	0.617
1,3,5-Trimethylbenzene (Mesitylene)	2.4
2,2,4-Trimethylpentane	1.56
4-Ethyltoluene	2.28
Acetone	17.5
Benzene	1.2
Carbon Disulfide	1.67
Chloroform	1.82
Chloromethane	0.299 J
Cyclohexane	3.13
Dichlorodifluoromethane	4.66
Ethanol	3.88 J
Ethylbenzene	3.41
M,P-Xylenes	12.1
Methyl Ethyl Ketone (2-Butanone)	3.07
N-Heptane	4.18
N-Hexane	3.59
O-Xylene (1,2-Dimethylbenzene)	5.52
Tert-Butyl Alcohol	1.15 J
Tetrachloroethylene (PCE)	197
Toluene	8.55
Trichlorofluoromethane	1.75

SV-04_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,1,1-Trichloroethane	5.84
1,2,4-Trimethylbenzene	13.8
1,3,5-Trimethylbenzene (Mesitylene)	3.85
4-Ethyltoluene	2.65
Acetone	6.46
Carbon Disulfide	1.46
Dichlorodifluoromethane	3.04
Ethylbenzene	4.31
M,P-Xylenes	18.2
N-Heptane	1.9
N-Hexane	1.28
O-Xylene (1,2-Dimethylbenzene)	7.21
Tetrachloroethylene (PCE)	678
Toluene	14.3

RI-SV-06_20200921:	9/21/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	12
2-Hexanone	63.1
2,2,4-Trimethylpentane	11.2
Acetone	90
Benzene	7.51
Carbon Disulfide	5.98
Cyclohexane	3.96
Ethanol	56.9
Ethylbenzene	18.9
M,P-Xylenes	63
Methyl Ethyl Ketone (2-Butanone)	767
N-Heptane	12
N-Hexane	10.2
O-Xylene (1,2-Dimethylbenzene)	20.9
Tetrachloroethylene (PCE)	168
Toluene	41.8

RI-IA-01_20200922:	9/22/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	7.72
1,3-Butadiene	1.42
1,3,5-Trimethylbenzene (Mesitylene)	1.97
2,2,4-Trimethylpentane	9.67
4-Ethyltoluene	1.09
Acetone	50.6
Benzene	4.15
Carbon Tetrachloride	0.421
Chloromethane	0.805
Cyclohexane	[illegible]
Dichlorodifluoromethane	2.13
Ethanol	56.5
Ethylbenzene	5.6
Isopropanol	12.8
M,P-Xylenes	19.6
Methyl Ethyl Ketone (2-Butanone)	1.79
N-Heptane	4.92
N-Hexane	5.74
O-Xylene (1,2-Dimethylbenzene)	5.82
Styrene	1.64
Tetrachloroethylene (PCE)	0.515
Toluene	81

RI-SV-01_20200922:	9/22/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	16.4
1,3,5-Trimethylbenzene (Mesitylene)	4.33
2,2,4-Trimethylpentane	10.2
4-Ethyltoluene	4.45
Acetone	51.8
Benzene	4.38
Carbon Disulfide	2.34
Chloroform	21.3
Cyclohexane	4.37
Ethylbenzene	12.1
M,P-Xylenes	45.2
Methyl Ethyl Ketone (2-Butanone)	7.11
N-Heptane	7.54
N-Hexane	4.58
O-Xylene (1,2-Dimethylbenzene)	14.4
Tetrachloroethylene (PCE)	1,270
Toluene	37.2
Trichloroethylene (TCE)	53.1

SV-8_20190210:	2/10/2019
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	551
1,3,5-Trimethylbenzene (Mesitylene)	683
2,2,4-Trimethylpentane	26,200
4-Ethyltoluene	258
Acetone	603
Benzene	286
Cyclohexane	2,980
Ethylbenzene	1,860
M,P-Xylenes	5,170
N-Heptane	5,860
N-Hexane	6,310
O-Xylene (1,2-Dimethylbenzene)	2,590
Tetrachloroethylene (PCE)	7,120
Toluene	7,240
Trichloroethylene (TCE)	372
Xylenes, Total	7,730

AA-01_20190119:	1/19/2019
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
Acetone	5.23
Benzene	0.764
Chloromethane	1.08
Dichlorodifluoromethane	2.69
Ethanol	9.42
Isopropanol	1.49
Toluene	1.12
Trichloroethylene (TCE)	1.49
Trichlorofluoromethane	1.47

RI-SV-07_20211122:	11/22/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,1-Trichloroethane	1.33
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	0.529 J
1,2-Dichloroethane	0.87
1,2-Dichloropropane	1.73
1,2,4-Trimethylbenzene	13.2
1,3-Butadiene	0.892
1,3,5-Trimethylbenzene (Mesitylene)	3.95
2-Hexanone	8.97
2,2,4-Trimethylpentane	3.83
4-Ethyltoluene	2.95
Acetone	1,000
Benzene	5.46
Carbon Disulfide	3.18
Chloroform	6.35
Cyclohexane	2.98
Dichlorodifluoromethane	2.82
Ethanol	22
Ethylbenzene	6.34
Isopropanol	26.5
M,P-Xylenes	21.9
Methyl Ethyl Ketone (2-Butanone)	76.7
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	14.3
Methylene Chloride	9.41
N-Heptane	7.62
N-Hexane	5.53
O-Xylene (1,2-Dimethylbenzene)	8.95
Styrene	0.873
Tert-Butyl Alcohol	12.3
Tetrachloroethylene (PCE)	176
Toluene	34.3
Trichloroethylene (TCE)	2.91
Trichlorofluoromethane	1.78

SV-02_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,1,1-Trichloroethane	7.91
1,2,4-Trimethylbenzene	16
1,3,5-Trimethylbenzene (Mesitylene)	10.8
4-Ethyltoluene	5.56
Acetone	168
Benzene	67.7
Carbon Disulfide	16.7
Chloroform	18.2
Cyclohexane	4.41
Ethylbenzene	217
Isopropanol	6.54
M,P-Xylenes	539
Methyl Ethyl Ketone (2-Butanone)	23.2
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	24.8
N-Heptane	46.3
N-Hexane	18.5
O-Xylene (1,2-Dimethylbenzene)	189
Tetrachloroethylene (PCE)	103
Toluene	153

SV-01_20190119:	1/19/2019
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	9.09
1,3,5-Trimethylbenzene (Mesitylene)	6.49
Acetone	115
Benzene	3.58
Carbon Disulfide	69.8
Dichlorodifluoromethane	7.91
Isopropanol	8.06
Methyl Ethyl Ketone (2-Butanone)	14.9
N-Hexane	3.81
Tert-Butyl Alcohol	17.4
Tetrachloroethylene (PCE)	1,720
Toluene	13
Trichloroethylene (TCE)	14.1

RI-AA-01_20200921:	9/21/2020
COMPOUND	CONC. (µg/m^3)
2,2,4-Trimethylpentane	1.14
Acetone	10.7
Benzene	0.821
Carbon Tetrachloride	0.447
Chloromethane	0.797
Dichlorodifluoromethane	2.12
Ethanol	13.9
Isopropanol	2.26
M,P-Xylenes	2.45
Tetrachloroethylene (PCE)	0.19
Toluene	12.2

SV-5_20190210:	2/10/2019
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2-Dichloroethane	2.6
1,2,4-Trimethylbenzene	26.4
1,3-Butadiene	3.34
1,3,5-Trimethylbenzene (Mesitylene)	12.1
2,2,4-Trimethylpentane	120
4-Ethyltoluene	8.31
Acetone	1,490
Benzene	81.8
Carbon Disulfide	13.4
Cyclohexane	49.2
Dichlorodifluoromethane	2.85
Ethanol	2,860 D
Ethylbenzene	168
Isopropanol	96.8
M,P-Xylenes	786
Methyl Ethyl Ketone (2-Butanone)	192
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	36.1
N-Heptane	127
N-Hexane	116
O-Xylene (1,2-Dimethylbenzene)	148
Styrene	1.75
Tert-Butyl Alcohol	37.3
Tetrachloroethylene (PCE)	78.7
Toluene	165
Trichloroethylene (TCE)	4.13
Xylenes, Total	934

SV-03_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	15.9
1,3,5-Trimethylbenzene (Mesitylene)	4.42
2,2,4-Trimethylpentane	1.66
4-Ethyltoluene	3.38
Acetone	58.9
Benzene	4.19
Carbon Disulfide	9.78
Cyclohexane	4.06
Dichlorodifluoromethane	3.75
Ethylbenzene	6.6
Isopropanol	3.54
M,P-Xylenes	25.7
Methyl Ethyl Ketone (2-Butanone)	14
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	3.18
N-Heptane	89.7
N-Hexane	153
O-Xylene (1,2-Dimethylbenzene)	10.6
Tert-Butyl Alcohol	2.63
Tetrachloroethylene (PCE)	78
Toluene	27.7

SV-04_20190119:	1/19/2019
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
Acetone	55.1
Benzene	8.05
Carbon Disulfide	23.7
Chloroform	300
Tetrachloroethylene (PCE)	1,890
Toluene	5.62
Trichloroethylene (TCE)	103

RI-IA-04_20200922:	9/22/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	3.01
2,2,4-Trimethylpentane	3.89
Acetone	15.6
Benzene	1.76
Carbon Tetrachloride	0.352
Chloromethane	0.803
Cyclohexane	8.64
Dichlorodifluoromethane	1.59
Ethanol	133
Ethylbenzene	1.95
Isopropanol	8.9
M,P-Xylenes	6.43
N-Heptane	2.93
N-Hexane	1.3
O-Xylene (1,2-Dimethylbenzene)	2.08
Tetrachloroethylene (PCE)	0.298
Toluene	36.9

RI-SV-09_20211122:	11/22/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,1-Trichloroethane	0.988 J
1,2-Dichloropropane	3.09
1,2,4-Trimethylbenzene	9.44
1,3-Butadiene	0.741
1,3,5-Trimethylbenzene (Mesitylene)	3.4
2-Hexanone	1.33
2,2,4-Trimethylpentane	5.75
4-Ethyltoluene	1.24
Acetone	38
Benzene	3.64
Carbon Disulfide	5.54
Carbon Tetrachloride	1.94
Chloroform	0.816 J
Chloromethane	0.314 J
Cyclohexane	3.41
Dichlorodifluoromethane	3.43
Ethanol	6.07 J
Ethylbenzene	3.28
M,P-Xylenes	9.86
Methyl Ethyl Ketone (2-Butanone)	3.33
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	1.22 J
Methylene Chloride	11.6
N-Heptane	5.98
N-Hexane	9.45
O-Xylene (1,2-Dimethylbenzene)	5.21
Tert-Butyl Alcohol	3.76
Tetrachloroethylene (PCE)	106
Tetrahydrofuran	0.348 J
Toluene	9.31
Trichloroethylene (TCE)	0.672 J
Trichlorofluoromethane	1.69

RI-SV-04_20200922:	9/22/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	22.2
1,3,5-Trimethylbenzene (Mesitylene)	5.51
2-Hexanone	2.91
2,2,4-Trimethylpentane	4.51
4-Ethyltoluene	6.19
Acetone	23.3
Benzene	4.41
Carbon Disulfide	0.638
Chloroform	3.53
Cyclohexane	2.13
Dichlorodifluoromethane	2.4
Ethanol	29
Ethylbenzene	14
Isopropanol	3.22
M,P-Xylenes	53
Methyl Ethyl Ketone (2-Butanone)	12.6
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.82
N-Heptane	10.6
N-Hexane	7.51
O-Xylene (1,2-Dimethylbenzene)	17.3
Styrene	1.68
Tetrachloroethylene (PCE)	2.24
Toluene	42.2

SV-06_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	77.7
1,3-Butadiene	0.684
1,3,5-Trimethylbenzene (Mesitylene)	20
2-Hexanone	11.2
2,2,4-Trimethylpentane	9.34
4-Ethyltoluene	18
Acetone	41.8
Benzene	12.5
Carbon Disulfide	2.2
Chloroform	2.52
Cyclohexane	4.41
Dichlorodifluoromethane	2.03
Ethanol	114
Ethyl Acetate	18.5
Ethylbenzene	27.5
Isopropanol	5.85
M,P-Xylenes	111
Methyl Ethyl Ketone (2-Butanone)	110
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	7.95
N-Heptane	53.7
N-Hexane	21.5
O-Xylene (1,2-Dimethylbenzene)	41
Tert-Butyl Alcohol	4.52
Tetrachloroethylene (PCE)	57.7
Tetrahydrofuran	1.6
Toluene	90.4

SV-05_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	93.9
1,3,5-Trimethylbenzene (Mesitylene)	24.4
2-Hexanone	5.61
4-Ethyltoluene	19.9
Acetone	22
Benzene	12.2
Carbon Disulfide	17.1
Cyclohexane	6.4
Ethanol	2,830
Ethylbenzene	30.8
M,P-Xylenes	126
Methyl Ethyl Ketone (2-Butanone)	16
N-Heptane	63.5
N-Hexane	19.5
O-Xylene (1,2-Dimethylbenzene)	48.2
Tetrachloroethylene (PCE)	7.26
Toluene	91.2

SV-11_20190209:	2/9/2019
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	30.7
1,3-Dichlorobenzene	4.25
1,3,5-Trimethylbenzene (Mesitylene)	11.7
2,2,4-Trimethylpentane	1.54
4-Ethyltoluene	7.96
Acetone	50.6
Benzene	4.7
Carbon Disulfide	15.5
Cyclohexane	3.72
Dichlorodifluoromethane	4.16
Ethanol	12.4
Ethylbenzene	137
M,P-Xylenes	639
Methyl Ethyl Ketone (2-Butanone)	6.67
N-Heptane	14.3
N-Hexane	8.21
O-Xylene (1,2-Dimethylbenzene)	73.4
Tert-Butyl Alcohol	3.79
Tetrachloroethylene (PCE)	190
Toluene	18.2
Trichlorofluoromethane	2.1
Xylenes, Total	712

SV-12_20190209:	2/9/2019
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2-Dichlorobenzene	155
1,2,4-Trichlorobenzene	2.19
1,2,4-Trimethylbenzene	150
1,3-Dichlorobenzene	10.4
1,3,5-Trimethylbenzene (Mesitylene)	66.9
1,4-Dichlorobenzene	21.3
2-Hexanone	3.82
2,2,4-Trimethylpentane	2.1
4-Ethyltoluene	30.3
Acetone	337
Benzene	3.67
Carbon Disulfide	24.3
Chloroform	5.62
Cyclohexane	3.29
Dichlorodifluoromethane	2.59
Ethanol	108
Ethylbenzene	198
Isopropanol	14.4
M,P-Xylenes	869
Methyl Ethyl Ketone (2-Butanone)	84.1
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	11.8
Methylene Chloride	35.4
N-Heptane	7.95
N-Hexane	4.83
O-Xylene (1,2-Dimethylbenzene)	130
Tert-Butyl Alcohol	21.9
Tetrachloroethylene (PCE)	369
Toluene	39.6
Trichloroethylene (TCE)	4.75
Trichlorofluoromethane	1.35
Xylenes, Total	999

RI-SV-02_20200923:	9/23/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	23
1,3,5-Trimethylbenzene (Mesitylene)	5.95
2-Hexanone	6.15
2,2,4-Trimethylpentane	5.37
4-Ethyltoluene	4.45
Acetone	3.99
Benzene	4.12
Carbon Disulfide	2.09
Chloroform	1.52
Cyclohexane	2.48
Dichlorodifluoromethane	3.38
Ethylbenzene	15.4
M,P-Xylenes	55.6
Methyl Ethyl Ketone (2-Butanone)	30.7
N-Heptane	12
N-Hexane	7.75
O-Xylene (1,2-Dimethylbenzene)	19
Styrene	1.63
Tetrachloroethylene (PCE)	546
Toluene	51.6
Trichloroethylene (TCE)	4.56

RI-IA-02_20200923:	9/23/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	11.2
1,3-Butadiene	0.666
1,3,5-Trimethylbenzene (Mesitylene)	2.68
2,2,4-Trimethylpentane	6.12
4-Ethyltoluene	2.06
Acetone	138
Benzene	4.34
Carbon Tetrachloride	0.377
Chloromethane	0.789
Cyclohexane	1.97
Dichlorodifluoromethane	1.68
Ethanol	57.1
Ethylbenzene	5.52
Isopropanol	23.5
M,P-Xylenes	20.8
Methyl Ethyl Ketone (2-Butanone)	2.61
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	38.1
N-Heptane	5.98
N-Hexane	3.67
O-Xylene (1,2-Dimethylbenzene)	6.99
Styrene	4.51
Tetrachloroethylene (PCE)	0.671
Toluene	43.3

RI-SV-10_20211123:	11/23/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	13
1,3-Butadiene	0.5
1,3,5-Trimethylbenzene (Mesitylene)	3.51
2,2,4-Trimethylpentane	1.47
4-Ethyltoluene	2.48
Acetone	50.4
Benzene	1.92
Carbon Disulfide	4.55
Chloroform	0.474 J
Cyclohexane	1.68
Dichlorodifluoromethane	2.49
Ethanol	41.5
Ethylbenzene	4.34
Isopropanol	1.62
M,P-Xylenes	16.4
Methyl Ethyl Ketone (2-Butanone)	7.85
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.82 J
Methylene Chloride	0.598 J
N-Heptane	4.08
N-Hexane	4.62
O-Xylene (1,2-Dimethylbenzene)	7.12
Styrene	0.285 J
Tert-Butyl Alcohol	1.71
Tetrachloroethylene (PCE)	3.36
Tetrahydrofuran	0.46 J
Toluene	11.7
Trichlorofluoromethane	1.33

RI-SV-03_20200922:	9/22/2020
COMPOUND	CONC. (µg/m^3)
1,1,1-Trichloroethane	2.25
1,2,4-Trimethylbenzene	17.8
1,3-Butadiene	2.9
1,3,5-Trimethylbenzene (Mesitylene)	4.65
2,2,4-Trimethylpentane	6.07
4-Ethyltoluene	4.64
Acetone	17.2
Benzene	7.48
Carbon Disulfide	2.44
Chlorobenzene	2.17
Chloroform	43.3
Cis-1,2-Dichloroethylene	4.76
Cyclohexane	2.79
Dichlorodifluoromethane	2.48
Ethanol	24.3
Ethylbenzene	13.5
Isopropanol	2.75
M,P-Xylenes	49.1
Methyl Ethyl Ketone (2-Butanone)	7.55
N-Heptane	11.8
N-Hexane	11
O-Xylene (1,2-Dimethylbenzene)	16.1
Tetrachloroethylene (PCE)	773
Toluene	41.8
Trichloroethylene (TCE)	109

RI-IA-03_20200922:	9/22/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	27.5
1,3-Butadiene	0.659
1,3,5-Trimethylbenzene (Mesitylene)	10
2,2,4-Trimethylpentane	7.99
4-Ethyltoluene	8.85
Acetone	25.4
Benzene	9.46
Carbon Tetrachloride	0.396
Chlorobenzene	62.2
Chloroform	1.48
Chloromethane	0.793
Cyclohexane	5.71
Dichlorodifluoromethane	2.14
Ethanol	55.2
Ethylbenzene	8.21
Isopropanol	5.24
M,P-Xylenes	78.2
N-Heptane	4.3
N-Hexane	2.63
O-Xylene (1,2-Dimethylbenzene)	14.5
Tetrachloroethylene (PCE)	7.39
Toluene	84
Trichloroethylene (TCE)	0.29
Trichlorofluoromethane	1.13

RI-SV-05_20200921:	9/21/2020
COMPOUND	CONC. (µg/m^3)
1,2,4-Trimethylbenzene	14
1,3-Butadiene	3.96
2-Hexanone	171
Acetone	144
Benzene	1,140
Carbon Disulfide	5.29
Cyclohexane	28.3
Ethanol	66.9
Ethylbenzene	25
M,P-Xylenes	105
Methyl Ethyl Ketone (2-Butanone)	1,090
N-Heptane	196
N-Hexane	65.6
O-Xylene (1,2-Dimethylbenzene)	35.2
Tetrachloroethylene (PCE)	23.2
Toluene	712

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

LEGEND

▭	PROJECT SITE BOUNDARY
456	BLOCK NUMBER
20	LOT BOUNDARY
▭	BUILDING
◧	SOIL VAPOR POINT (2021 RI)
⌖	AMBIENT AIR SAMPLE (2021 RI)
◧	SOIL VAPOR POINT (2020 RI)
■	SOIL VAPOR POINT/INDOOR AIR SAMPLE LOCATION (2020 RI)
⊠	AMBIENT AIR SAMPLE (2020 RI)
⊕	SOIL BORING/SOIL VAPOR POINT (2021 SI)
◐	SOIL BORING/TEMPORARY MONITORING WELL/SOIL VAPOR POINT (2021 SI)
⌖	AMBIENT AIR SAMPLE (2021 SI)
◐	SOIL BORING/MONITORING WELL/SOIL VAPOR POINT (2019 SI)
⊕	SOIL VAPOR POINT (2019 SI)
⌖	AMBIENT AIR SAMPLE (2019 SI)

µg/m^3- micrograms per cubic meter

D: Analyte concentration obtained from dilution.

Sample ID

Sample Date

SV-05_20210413:	4/13/2021
COMPOUND	CONC. (µg/m^3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	93.9
1,3,5-Trimethylbenzene (Mesitylene)	24.4
2-Hexanone	5.61
4-Ethyltoluene	19.9
Acetone	22
Benzene	12.2
Carbon Disulfide	17.1
Cyclohexane	6.4
Ethanol	2,830
Ethylbenzene	30.8
M,P-Xylenes	126
Methyl Ethyl Ketone (2-Butanone)	16
N-Heptane	63.5
N-Hexane	19.5
O-Xylene (1,2-Dimethylbenzene)	48.2
Tetrachloroethylene (PCE)	7.26
Toluene	91.2

Analyte/Compound

Concentration

REBECCA A. KINAL
082046-1

0 20 40 80
SCALE IN FEET

AKRF
440 Park Avenue South, New York, NY 10016

272 4th Avenue
Brooklyn, New York

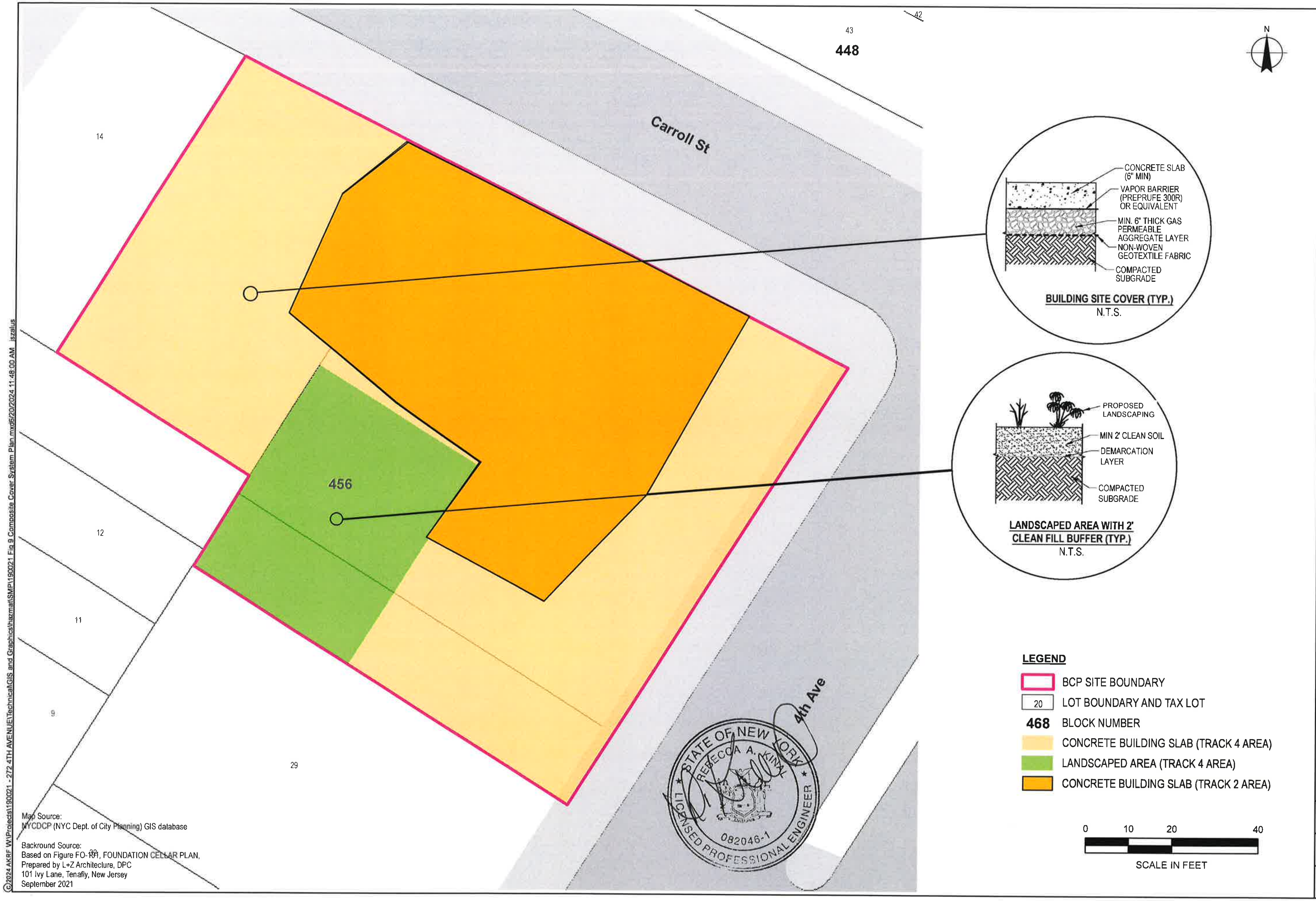
RI SOIL VAPOR SAMPLE CONCENTRATIONS

DATE
6/20/2024

PROJECT NO.
190021

FIGURE
8

Document Path: W:\Projects\190021 - 272 4TH AVENUE\Technical\GIS and Graphics\hazmat\SMP\190021 Fig 8 RI Soil Vapor Sample Concentrations.mxd Date Saved: 6/20/2024 11:04:47 AM Author:



STATE OF NEW YORK
REBECCA A. KINAL
082046-1
LICENSED PROFESSIONAL ENGINEER

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

Backround Source:
Based on Figure FO-101, FOUNDATION CELLAR PLAN,
Prepared by L+Z Architecture, DPC
101 Ivy Lane, Tenafly, New Jersey
September 2021

AKRF
440 Park Avenue South, New York, NY 10016

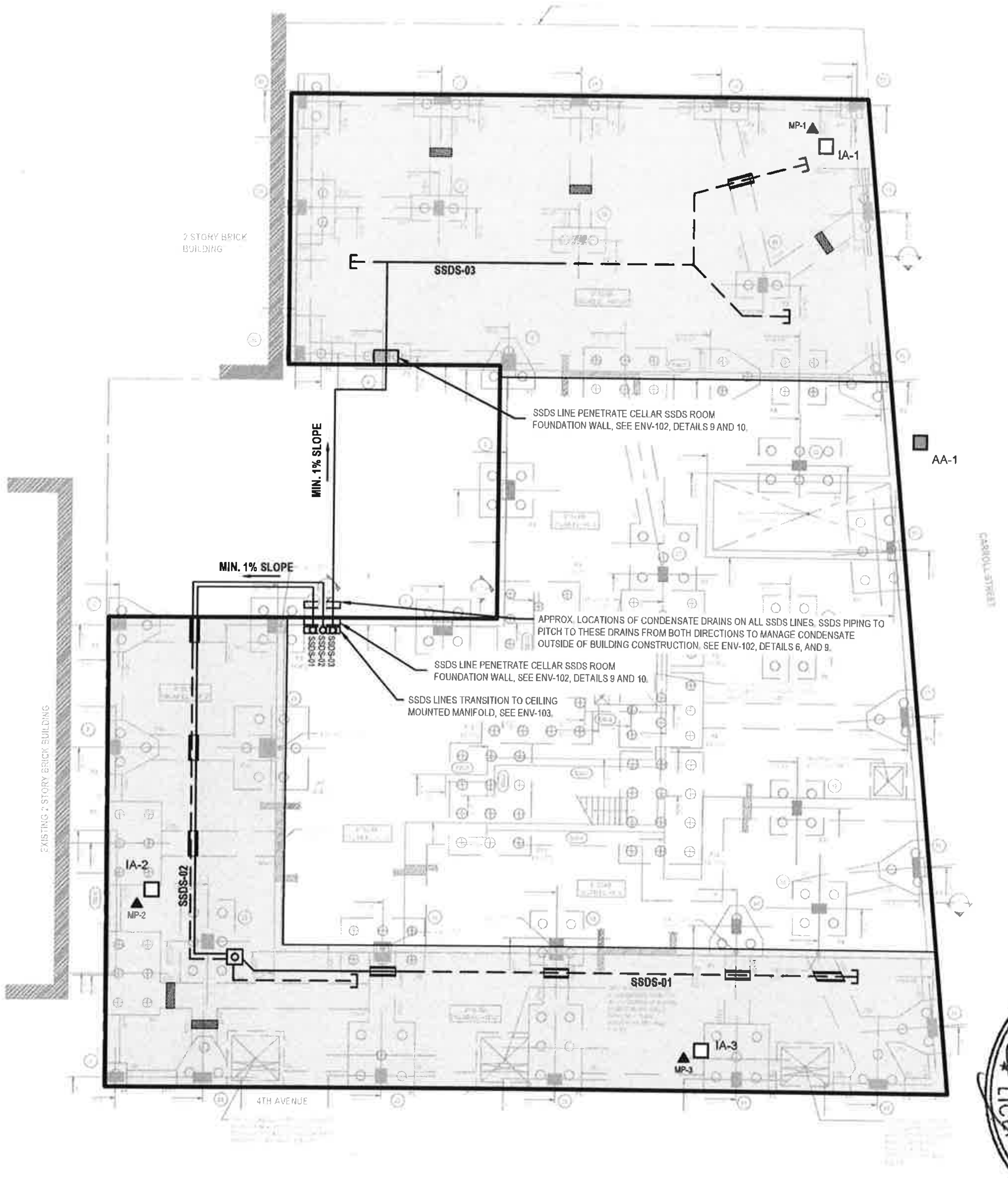
272 4th Ave
Brooklyn, New York

AS-BUILT COMPOSITE COVER SYSTEM PLAN

DATE
12/9/2024

PROJECT NO.
190021

FIGURE
9



SSDS LINE PENETRATE CELLAR SSDS ROOM FOUNDATION WALL, SEE ENV-102, DETAILS 9 AND 10.

APPROX. LOCATIONS OF CONDENSATE DRAINS ON ALL SSDS LINES. SSDS PIPING TO PITCH TO THESE DRAINS FROM BOTH DIRECTIONS TO MANAGE CONDENSATE OUTSIDE OF BUILDING CONSTRUCTION. SEE ENV-102, DETAILS 6, AND 9.

SSDS LINE PENETRATE CELLAR SSDS ROOM FOUNDATION WALL, SEE ENV-102, DETAILS 9 AND 10.

SSDS LINES TRANSITION TO CEILING MOUNTED MANIFOLD, SEE ENV-103.

LEGEND

▭	EXTENT OF VAPOR BARRIER
▭	EXTENT OF GAS PERMEABLE AGGREGATE UNDER SLAB PIPE
▭	SLEEVE THROUGH FOUNDATION ELEMENT COMMUNICATION
▨	SLEEVE THROUGH FOUNDATION ELEMENT 4" Ø SLOTTED
— — — —]	SCHEDULE 40 PVC PIPE WITH PVC END CAP 4" Ø SOLID
——	SCHEDULE 40 PVC PIPE
⊡	CONDENSATE DRAN
▲ MP-1	VACUUM MONITORING POINT
☐ IA-1	INDOOR AIR SAMPE LOCATION
■ AA-1	AMBIENT AIR SAMPLE LOCATION

MONITORING POINT LOCATIONS

ID	BUILDING ROOM NAME
MP-1	RETAIL, WEST OF COLUMN 21
MP-2	RETAIL, BETWEEN COLUMNS 1 AND 2
MP-3	GYM, WEST OF COLUMN 13

REBECCA A. KINAL
082046-1

0 10 20 40
SCALE IN FEET

NOTE: PIPE SPACING NOT TO SCALE

AKRF
440 Park Avenue South, New York, NY 10016

272 4th Avenue
Brooklyn, New York

SSDS LAYOUT PLAN

DATE
6/18/2024
PROJECT NO.
190021
FIGURE
10

©2024 AKRF, Inc Q:\Projects\190021 - 272 4TH AVENUE\Technical\Hazmat\CAD\SMP and FER\190021 Fig 9 SSDS Layout Plan.dwg last save: mveilleux 6/18/2024 8:04 AM

TABLES

Table 1

272 4th Avenue

Brooklyn, NY

Groundwater Elevation Data

Monitoring Well	Top of Casing Elevation (ft.)	Depth to Water (ft. bgs)[2]	Groundwater Elevation (ft.)
MW-01	23.66	20.57	3.09
MW-02	27.70	24.43	3.27
MW-03	18.12	14.05	4.07

Notes:

[1] Elevation measured in feet (ft.) above mean sea level according to the North American Vertical Datum of 1988 (NAVD88).

[2] Depth to water measured in feet below ground surface (ft. bgs) at each sample location.

Table 2
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results

Volatile Organic Compounds

			AKRF Sample ID	BS-01_15_20231212	BS-01_15_20231212	BS-02_15_20231212	BS-03_15_20231212	BS-04_17_20240117	BS-05_17_20240117
			Laboratory Sample ID	L2373009-06	L2373009-06	L2373009-07	L2373009-08	L2402735-03	L2402735-04
			Date Sampled	12/12/2023	12/12/2023	12/12/2023	12/12/2023	1/17/2024	1/17/2024
			Dilution Factor	1	10	1	1	1	1
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
1,1,1-Trichloroethane	0.68	100	0.68	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
1,1,2-Trichloroethane	NS	NS	NS	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
1,1-Dichloroethane	0.27	47	0.27	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
1,1-Dichloroethene	0.24	0.98	0.33	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
1,1-Dichloropropene	NS	NS	NS	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
1,2,3-Trichloropropane	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	6.1 H	NR	0.092 H	0.014 H	0.0023 U	0.0018 U
1,2,4-Trichlorobenzene	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	NR	**19 H**	**0.99 H**	0.021 H	0.0023 U	0.0018 U
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.16 U	NR	0.0026 U	0.0031 U	0.0034 U	0.0026 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
1,2-Dichlorobenzene	**1.1**	100	1.1	**1.8 H**	NR	0.023 H	0.0012 J	0.0023 U	0.0018 U
1,2-Dichloroethane	0.02	5.8	0.02	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
1,2-Dichloropropane	NS	NS	NS	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	**5.8 H**	NR	0.084 H	0.0081 H	0.0023 U	0.0018 U
1,3-Dichlorobenzene	2.4	38	2.6	0.14 H	NR	0.0021 H	0.0021 U	0.0023 U	0.0018 U
1,3-Dichloropropane	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
1,4-Dichlorobenzene	1.8	24	1.8	0.57 H	NR	0.0084 H	0.00034 J	0.0023 U	0.0018 U
1,4-Diethyl Benzene	NS	NS	NS	2.2 H	NR	0.036 H	0.002 J	0.0023 U	0.0018 U
2,2-Dichloropropane	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
2-Chlorotoluene	NS	NS	NS	0.39 H	NR	0.0089 H	0.0021 U	0.0023 U	0.0018 U
2-Hexanone	NS	NS	NS	0.54 U	NR	0.0086 U	0.01 U	0.011 U	0.0089 U
4-Chlorotoluene	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
4-Ethyltoluene	NS	NS	NS	6.2 H	NR	0.082 H	0.0063 H	0.0023 U	0.0018 U
Acetone	**0.03**	100	0.03	0.54 U	NR	0.02 H	0.022 H	**0.045 J**	0.0091 J
Acrylonitrile	NS	NS	NS	0.22 U	NR	0.0034 U	0.0042 U	0.0046 U	0.0035 U
Benzene	**0.06**	3.7	0.06	**0.17 H**	NR	0.004 H	0.016 H	0.00057 U	0.00044 U
Bromobenzene	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
Bromochloromethane	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
Bromodichloromethane	NS	NS	NS	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
Bromoform	NS	NS	NS	0.22 U	NR	0.0034 U	0.0042 U	0.0046 U	0.0035 U
Bromomethane	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 UJ	0.0018 UJ
Carbon Disulfide	NS	NS	NS	0.54 U	NR	0.0086 U	0.01 U	0.011 U	0.0089 U
Carbon Tetrachloride	0.76	7.1	0.76	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
Chlorobenzene	**1.1**	100	1.1	**4.2 H**	NR	0.094 H	0.11 H	0.00057 U	0.00044 U
Chloroethane	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
Chloroform	0.37	24	0.37	0.081 U	NR	0.0013 U	0.0016 U	0.0017 U	0.0013 U
Chloromethane	NS	NS	NS	0.22 U	NR	0.0034 U	0.0042 U	0.0046 U	0.0035 U
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.054 U	NR	0.00083 J	0.001 U	0.0011 U	0.00089 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
Cymene	NS	NS	NS	1.5 H	NR	0.0084 H	0.0017 H	0.0011 U	0.00089 U
Dibromochloromethane	NS	NS	NS	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
Dibromomethane	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 U	0.0018 U
Dichlorodifluoromethane	NS	NS	NS	0.54 U	NR	0.0086 U	0.01 U	0.011 U	0.0089 U
Dichloroethylenes	NS	NS	NS	0.054 U	NR	0.00083 J	0.001 U	0.0011 U	0.00089 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.11 U	NR	0.0017 U	0.0021 U	0.0023 UJ	0.0018 UJ
Ethylbenzene	1	76	1	0.96 H	NR	0.026 H	0.0013 H	0.0011 U	0.00089 U
Isopropylbenzene (Cumene)	NS	NS	NS	1.8 H	NR	0.039 H	0.002 H	0.0011 U	0.00089 U
M,P-Xylenes	NS	NS	NS	6.6 H	NR	0.12 H	0.036 H	0.0023 U	0.0018 U
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.54 U	NR	0.0086 U	0.0045 J	0.011 U	0.0089 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.54 U	NR	0.0086 U	0.01 U	0.011 U	0.0089 U
Methylene Chloride	**0.05**	81	0.05	0.27 U	NR	0.0043 U	0.0052 U	0.0057 U	0.0044 U
N-Butylbenzene	18	100	18	3.4 H	NR	0.051 H	0.0036 H	0.0011 U	0.00089 U
N-Propylbenzene	5	100	5	4.5 H	NR	0.088 H	0.0038 H	0.0011 U	0.00089 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	6.2 H	NR	0.096 H	0.054 H	0.0011 U	0.00089 U
Sec-Butylbenzene	25	100	25	2.3 H	NR	0.04 H	0.0026 H	0.0011 U	0.00089 U
Styrene	NS	NS	NS	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
T-Butylbenzene	11	100	11	0.26 H	NR	0.0053 H	0.00038 J	0.0023 U	0.0018 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.11 U	NR	0.0006 J	0.0021 U	0.0023 U	0.0018 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.019 J	NR	0.00053 H	0.00052 U	0.00057 U	0.00044 U
Toluene	0.7	100	0.7	0.31 H	NR	0.0049 H	0.00073 J	0.0011 U	0.00089 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.081 U	NR	0.0013 U	0.0016 U	0.0017 U	0.0013 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.27 U	NR	0.0043 U	0.0052 U	0.0057 UJ	0.0044 UJ
Trichloroethylene (TCE)	0.47	6.4	0.47	0.027 U	NR	0.00043 U	0.00052 U	0.00057 U	0.00044 U
Trichlorofluoromethane	NS	NS	NS	0.22 U	NR	0.0034 U	0.0042 U	0.0046 U	0.0035 U
Vinyl Acetate	NS	NS	NS	0.54 U	NR	0.0086 U	0.01 U	0.011 U	0.0089 U
Vinyl Chloride	0.02	0.48	0.03	0.054 U	NR	0.00086 U	0.001 U	0.0011 U	0.00089 U
Xylenes, Total	**0.26**	100	1.2	**13 H**	NR	**0.67 H**	0.09 H	0.0011 U	0.00089 U

Table 2
272 4th Avenue
Brooklyn, NY

Soil Documentation Analytical Results

Volatile Organic Compounds

AKRF Sample ID				BS-06_17_20240123	BS-07_17_20240123	BS-08_17_20240126	BS-09_17_20240126	BS-10_17_20240129	BS-11_17_20240131
Laboratory Sample ID				L2403778-01	L2403778-02	L2404658-07	L2404658-08	L2404867-02	L2405262-01
Date Sampled				1/23/2024	1/23/2024	1/26/2024	1/26/2024	1/29/2024	1/31/2024
Dilution Factor				1	1	1	1	1	1
Unit				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
1,1,1-Trichloroethane	0.68	100	0.68	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
1,1,2-Trichloroethane	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
1,1-Dichloroethane	0.27	47	0.27	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
1,1-Dichloroethene	0.24	0.98	0.33	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 UJ	0.001 U
1,1-Dichloropropene	NS	NS	NS	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,2,3-Trichloropropane	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	0.002 UJ	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,2,4-Trichlorobenzene	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	0.002 UJ	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.003 U	0.0031 R	0.0026 U	0.0027 U	0.0027 U	0.0032 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 UJ	0.0009 U	0.001 U
1,2-Dichlorobenzene	**1.1**	100	1.1	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,2-Dichloroethane	0.02	5.8	0.02	0.001 UJ	0.001 R	0.00086 U	0.0009 UJ	0.0009 U	0.001 UJ
1,2-Dichloropropane	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,3-Dichlorobenzene	2.4	38	2.6	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,3-Dichloropropane	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,4-Dichlorobenzene	1.8	24	1.8	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
1,4-Diethyl Benzene	NS	NS	NS	0.002 UJ	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
2,2-Dichloropropane	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
2-Chlorotoluene	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
2-Hexanone	NS	NS	NS	0.01 U	0.01 R	0.0086 U	0.009 U	0.009 UJ	0.01 U
4-Chlorotoluene	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
4-Ethyltoluene	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
Acetone	**0.03**	100	0.03	0.028 J	**0.11 J**	**0.049**	0.028	0.014	0.01 U
Acrylonitrile	NS	NS	NS	0.004 U	0.0042 R	0.0034 U	0.0036 U	0.0036 U	0.0042 U
Benzene	**0.06**	3.7	0.06	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
Bromobenzene	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
Bromochloromethane	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
Bromodichloromethane	NS	NS	NS	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
Bromoform	NS	NS	NS	0.004 U	0.0042 R	0.0034 U	0.0036 U	0.0036 U	0.0042 U
Bromomethane	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 UJ	0.0018 U	0.0021 U
Carbon Disulfide	NS	NS	NS	0.01 U	0.01 R	0.0086 UJ	0.009 U	0.009 UJ	0.01 U
Carbon Tetrachloride	0.76	7.1	0.76	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Chlorobenzene	**1.1**	100	1.1	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00044 J	0.00052 U
Chloroethane	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 UJ	0.0021 U
Chloroform	0.37	24	0.37	0.0015 U	0.00014 J	0.0013 U	0.0013 U	0.0013 U	0.0016 U
Chloromethane	NS	NS	NS	0.004 U	0.0042 R	0.0034 U	0.0036 U	0.0036 U	0.0042 U
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
Cymene	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Dibromochloromethane	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Dibromomethane	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
Dichlorodifluoromethane	NS	NS	NS	0.01 UJ	0.01 R	0.0086 U	0.009 UJ	0.009 U	0.01 UJ
Dichloroethylenes	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.002 U	0.0021 R	0.0017 U	0.0018 UJ	0.0018 UJ	0.0021 U
Ethylbenzene	1	76	1	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Isopropylbenzene (Cumene)	NS	NS	NS	0.001 UJ	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
M,P-Xylenes	NS	NS	NS	0.00075 J	0.0007 J	0.0017 U	0.0018 U	0.0018 U	0.00066 J
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.006 J	0.027 J	0.0086 U	0.0029 J	0.0023 J	0.01 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.01 U	0.01 R	0.0086 U	0.009 U	0.009 UJ	0.01 U
Methylene Chloride	**0.05**	81	0.05	0.005 U	0.0052 R	0.0043 U	0.0045 UJ	0.0045 U	0.0052 U
N-Butylbenzene	18	100	18	0.001 UJ	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
N-Propylbenzene	5	100	5	0.001 UJ	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	0.00067 J	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Sec-Butylbenzene	25	100	25	0.001 UJ	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Styrene	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
T-Butylbenzene	11	100	11	0.002 U	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.002 UJ	0.0021 R	0.0017 U	0.0018 U	0.0018 U	0.0021 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
Toluene	0.7	100	0.7	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.0015 U	0.0016 R	0.0013 U	0.0013 U	0.0013 U	0.0016 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.005 U	0.0052 R	0.0043 U	0.0045 UJ	0.0045 UJ	0.0052 U
Trichloroethylene (TCE)	0.47	6.4	0.47	0.0005 U	0.00052 R	0.00043 U	0.00045 U	0.00045 U	0.00052 U
Trichlorofluoromethane	NS	NS	NS	0.004 UJ	0.0042 R	0.0034 U	0.0036 UJ	0.0036 UJ	0.0042 U
Vinyl Acetate	NS	NS	NS	0.01 U	0.01 R	0.0086 U	0.009 U	0.009 U	0.01 U
Vinyl Chloride	0.02	0.48	0.03	0.001 U	0.001 R	0.00086 U	0.0009 U	0.0009 U	0.001 U
Xylenes, Total	**0.26**	100	1.2	0.0014 J	0.0007 J	0.00086 U	0.0009 U	0.0009 U	0.00066 J

Table 2
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results

Volatile Organic Compounds

			AKRF Sample ID	EP-01_2_20231005	EP-02_2_20231005	EP-03_2_20231005	EP-04_2_20231005	EP-05_2_20231005	EP-06_2_20231005
			Laboratory Sample ID	L2359312-01	L2359312-02	L2359312-03	L2359312-04	L2359312-05	L2359312-06
			Date Sampled	10/05/2023	10/05/2023	10/05/2023	10/05/2023	10/05/2023	10/05/2023
			Dilution Factor	1	1	1	1	1	1
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
1,1,1-Trichloroethane	0.68	100	0.68	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
1,1,2-Trichloroethane	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
1,1-Dichloroethane	0.27	47	0.27	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
1,1-Dichloroethene	0.24	0.98	0.33	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
1,1-Dichloropropene	NS	NS	NS	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,2,3-Trichloropropane	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,2,4-Trichlorobenzene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.0036 U	0.003 U	0.0042 U	0.0043 U	0.0034 U	0.0039 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
1,2-Dichlorobenzene	**1.1**	100	1.1	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,2-Dichloroethane	0.02	5.8	0.02	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
1,2-Dichloropropane	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,3-Dichlorobenzene	2.4	38	2.6	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,3-Dichloropropane	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,4-Dichlorobenzene	1.8	24	1.8	0.0002 J	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
1,4-Diethyl Benzene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
2,2-Dichloropropane	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
2-Chlorotoluene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
2-Hexanone	NS	NS	NS	0.012 U	0.01 U	0.014 U	0.014 U	0.011 U	0.013 U
4-Chlorotoluene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
4-Ethyltoluene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Acetone	**0.03**	100	0.03	0.012 U	0.01 U	0.014 U	0.014 U	0.011 U	0.026
Acrylonitrile	NS	NS	NS	0.0048 U	0.0041 U	0.0056 U	0.0057 U	0.0046 U	0.0052 U
Benzene	**0.06**	3.7	0.06	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
Bromobenzene	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Bromochloromethane	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Bromodichloromethane	NS	NS	NS	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
Bromoform	NS	NS	NS	0.0048 U	0.0041 U	0.0056 U	0.0057 U	0.0046 U	0.0052 U
Bromomethane	NS	NS	NS	0.0024 UJ	0.002 UJ	0.0028 UJ	0.0028 UJ	0.0023 UJ	0.0026 UJ
Carbon Disulfide	NS	NS	NS	0.012 U	0.01 U	0.014 U	0.014 U	0.011 U	0.013 U
Carbon Tetrachloride	0.76	7.1	0.76	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Chlorobenzene	**1.1**	100	1.1	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
Chloroethane	NS	NS	NS	0.0024 UJ	0.002 UJ	0.0028 UJ	0.0028 UJ	0.0023 UJ	0.0026 UJ
Chloroform	0.37	24	0.37	0.0018 U	0.0015 U	0.0021 U	0.0021 U	0.0017 U	0.0019 U
Chloromethane	NS	NS	NS	0.0048 UJ	0.0041 UJ	0.0056 UJ	0.0057 UJ	0.0046 UJ	0.0052 UJ
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
Cymene	NS	NS	NS	0.0012 U	0.001 U	0.0011 J	0.0014 U	0.0011 U	0.0013 U
Dibromochloromethane	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Dibromomethane	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Dichlorodifluoromethane	NS	NS	NS	0.012 UJ	0.01 UJ	0.014 UJ	0.014 UJ	0.011 UJ	0.013 UJ
Dichloroethylenes	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Ethylbenzene	1	76	1	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Isopropylbenzene (Cumene)	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
M,P-Xylenes	NS	NS	NS	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.012 U	0.01 U	0.014 U	0.014 U	0.011 U	0.013 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.012 U	0.01 U	0.014 U	0.014 U	0.011 U	0.013 U
Methylene Chloride	**0.05**	81	0.05	0.006 U	0.0051 U	0.0071 U	0.0071 U	0.0057 U	0.0065 U
N-Butylbenzene	18	100	18	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
N-Propylbenzene	5	100	5	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Sec-Butylbenzene	25	100	25	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Styrene	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
T-Butylbenzene	11	100	11	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.0024 U	0.002 U	0.0028 U	0.0028 U	0.0023 U	0.0026 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.0014	0.00094	0.00071 U	0.00071 U	0.00057 U	0.002
Toluene	0.7	100	0.7	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.0018 U	0.0015 U	0.0021 U	0.0021 U	0.0017 U	0.0019 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.006 U	0.0051 U	0.0071 U	0.0071 U	0.0057 U	0.0065 U
Trichloroethylene (TCE)	0.47	6.4	0.47	0.0006 U	0.00051 U	0.00071 U	0.00071 U	0.00057 U	0.00065 U
Trichlorofluoromethane	NS	NS	NS	0.0048 UJ	0.0041 U	0.0056 U	0.0057 U	0.0046 U	0.0052 U
Vinyl Acetate	NS	NS	NS	0.012 U	0.01 U	0.014 U	0.014 U	0.011 U	0.013 U
Vinyl Chloride	0.02	0.48	0.03	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U
Xylenes, Total	**0.26**	100	1.2	0.0012 U	0.001 U	0.0014 U	0.0014 U	0.0011 U	0.0013 U

Table 2
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results

Volatile Organic Compounds

			AKRF Sample ID	EP-07_2_20231005	EP-08_2_20231013	EP-09_2-6_20231215	EP-10_2-6_20231215	SW-01_10_20231211	SW-02_10_20231211
			Laboratory Sample ID	L2359312-07	L2359312-08	L2374328-01	L2374328-02	L2373009-01	L2373009-02
			Date Sampled	10/05/2023	10/13/2023	12/15/2023	12/15/2023	12/11/2023	12/11/2023
			Dilution Factor	1	1	1	1	1	1
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
1,1,1-Trichloroethane	0.68	100	0.68	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
1,1,2-Trichloroethane	NS	NS	NS	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
1,1-Dichloroethane	0.27	47	0.27	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
1,1-Dichloroethene	0.24	0.98	0.33	0.0011 U	0.077 U	0.0013 U	0.00087 UJ	0.0009 U	0.00083 U
1,1-Dichloropropene	NS	NS	NS	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
1,2,3-Trichloropropane	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	0.00084 J	3.5 H	0.0026 U	0.0017 U	0.0018 U	0.00028 J
1,2,4-Trichlorobenzene	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	0.0022 U	**8 H**	0.0026 U	0.0017 U	0.0018 U	0.00064 J
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.0034 U	0.23 U	0.0039 U	0.0026 U	0.0027 U	0.0025 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
1,2-Dichlorobenzene	**1.1**	100	1.1	0.0022 U	1.1 H	0.0026 U	0.0017 U	0.0018 U	0.0016 U
1,2-Dichloroethane	0.02	5.8	0.02	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
1,2-Dichloropropane	NS	NS	NS	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	0.00033 J	**4.3 H**	0.0026 U	0.0017 U	0.0018 U	0.00028 J
1,3-Dichlorobenzene	2.4	38	2.6	0.0022 U	0.1 J	0.0026 U	0.0017 U	0.0018 U	0.0016 U
1,3-Dichloropropane	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
1,4-Dichlorobenzene	1.8	24	1.8	0.0022 U	0.65 H	0.0026 U	0.0017 U	0.0018 U	0.0016 U
1,4-Diethyl Benzene	NS	NS	NS	0.0018 J	11 H	0.0026 U	0.0017 U	0.0018 U	0.0016 U
2,2-Dichloropropane	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
2-Chlorotoluene	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
2-Hexanone	NS	NS	NS	0.011 U	0.77 U	0.013 U	0.0087 U	0.009 U	0.0083 U
4-Chlorotoluene	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
4-Ethyltoluene	NS	NS	NS	0.0022 U	5.3 H	0.0026 U	0.0017 U	0.0018 U	0.0016 U
Acetone	**0.03**	100	0.03	0.022	0.77 U	0.013 U	0.0087 UJ	0.009 U	0.011
Acrylonitrile	NS	NS	NS	0.0045 U	0.31 U	0.0052 U	0.0035 U	0.0036 U	0.0033 U
Benzene	**0.06**	3.7	0.06	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
Bromobenzene	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
Bromochloromethane	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
Bromodichloromethane	NS	NS	NS	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
Bromoform	NS	NS	NS	0.0045 U	0.31 U	0.0052 U	0.0035 U	0.0036 U	0.0033 U
Bromomethane	NS	NS	NS	0.0022 UJ	0.15 U	0.0026 U	0.0011 J	0.0018 U	0.0016 U
Carbon Disulfide	NS	NS	NS	0.011 U	0.77 U	0.013 U	0.0087 UJ	0.009 U	0.0083 U
Carbon Tetrachloride	0.76	7.1	0.76	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Chlorobenzene	**1.1**	100	1.1	0.00056 U	0.51 H	0.00066 U	0.00044 U	0.00045 U	0.00041 U
Chloroethane	NS	NS	NS	0.0022 UJ	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
Chloroform	0.37	24	0.37	0.0017 U	0.12 U	0.002 U	0.0013 U	0.0013 U	0.0012 U
Chloromethane	NS	NS	NS	0.0045 UJ	0.31 U	0.0052 U	0.0035 U	0.0036 U	0.0033 U
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.0011 U	0.076 J	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
Cymene	NS	NS	NS	0.00033 J	1.7 H	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Dibromochloromethane	NS	NS	NS	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Dibromomethane	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 U	0.0018 U	0.0016 U
Dichlorodifluoromethane	NS	NS	NS	0.011 UJ	0.77 U	0.013 U	0.0087 U	0.009 U	0.0083 U
Dichloroethylenes	NS	NS	NS	0.0011 U	0.076 J	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.0022 U	0.15 U	0.0026 U	0.0017 UJ	0.0018 U	0.0016 U
Ethylbenzene	1	76	1	0.00017 J	0.36 H	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Isopropylbenzene (Cumene)	NS	NS	NS	0.0011 U	0.19 H	0.0013 U	0.00087 U	0.0009 U	0.00083 U
M,P-Xylenes	NS	NS	NS	0.0022 U	1.9 H	0.0026 U	0.00067 J	0.0018 U	0.0016 U
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.011 U	0.77 U	0.013 U	0.0087 U	0.009 U	0.0083 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.011 U	0.77 U	0.013 U	0.0087 U	0.009 U	0.0083 U
Methylene Chloride	**0.05**	81	0.05	0.0045 J	**4.4 H**	0.0066 U	0.0044 UJ	0.0045 U	0.0041 U
N-Butylbenzene	18	100	18	0.0011 U	0.75 H	0.0013 U	0.00087 U	0.0009 U	0.00083 U
N-Propylbenzene	5	100	5	0.0011 U	0.49 H	0.0013 U	0.00087 U	0.0009 U	0.00083 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	0.0011 U	1.3 H	0.00073 J	0.00054 J	0.0009 U	0.00083 U
Sec-Butylbenzene	25	100	25	0.0011 U	0.52 H	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Styrene	NS	NS	NS	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
T-Butylbenzene	11	100	11	0.0022 U	0.14 J	0.0026 U	0.0017 U	0.0018 U	0.0016 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.0022 U	0.15 U	0.0026 U	0.0017 UJ	0.0018 U	0.0016 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.021	0.24 H	0.0043	0.0014	0.00045 U	0.00041 U
Toluene	0.7	100	0.7	0.0011 U	0.11 H	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.00056 U	0.039 U	0.00066 U	0.00044 U	0.00045 U	0.00041 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.0017 U	0.12 U	0.002 U	0.0013 UJ	0.0013 U	0.0012 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.0056 U	0.39 U	0.0066 U	0.0044 U	0.0045 U	0.0041 U
Trichloroethylene (TCE)	0.47	6.4	0.47	0.00072	0.012 J	0.00066 U	0.00044 U	0.00045 U	0.00041 U
Trichlorofluoromethane	NS	NS	NS	0.0045 U	0.31 U	0.0052 U	0.0035 U	0.0036 U	0.0033 U
Vinyl Acetate	NS	NS	NS	0.011 U	0.77 U	0.013 U	0.0087 U	0.009 U	0.0083 U
Vinyl Chloride	0.02	0.48	0.03	0.0011 U	0.077 U	0.0013 U	0.00087 U	0.0009 U	0.00083 U
Xylenes, Total	**0.26**	100	1.2	0.0011 U	**3.2 H**	0.00073 J	0.0012 J	0.0009 U	0.00083 U

Table 2
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results
Volatile Organic Compounds

			AKRF Sample ID	SW-03_10_20231211	SW-04_10_20231211	SW-05_10_20231211	SW-06_17_20240117	SW-07_17_20240117	X-17_20240123
			Laboratory Sample ID	L2373009-03	L2373009-04	L2373009-05	L2402735-01	L2402735-02	L2403778-04
			Date Sampled	12/11/2023	12/11/2023	12/11/2023	1/17/2024	1/17/2024	1/23/2024
			Dilution Factor	1	1	1	1	1	1
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
1,1,1-Trichloroethane	0.68	100	0.68	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
1,1,2-Trichloroethane	NS	NS	NS	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
1,1-Dichloroethane	0.27	47	0.27	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
1,1-Dichloroethene	0.24	0.98	0.33	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
1,1-Dichloropropene	NS	NS	NS	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
1,2,3-Trichloropropane	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	0.0014 J	0.0013 J	0.0021 U	0.0024 U	0.00033 J	0.0024 UJ
1,2,4-Trichlorobenzene	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	0.0016 J	0.00039 J	0.0021 U	0.0024 U	0.00054 J	0.0024 UJ
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.0027 U	0.0027 U	0.0032 U	0.0035 U	0.0029 U	0.0035 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
1,2-Dichlorobenzene	**1.1**	100	1.1	0.0018 U	0.0018 U	0.00021 J	0.0024 U	0.002 U	0.0024 U
1,2-Dichloroethane	0.02	5.8	0.02	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
1,2-Dichloropropane	NS	NS	NS	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	0.00066 J	0.00055 J	0.0021 U	0.0024 U	0.002 U	0.0024 U
1,3-Dichlorobenzene	2.4	38	2.6	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
1,3-Dichloropropane	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
1,4-Dichlorobenzene	1.8	24	1.8	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
1,4-Diethyl Benzene	NS	NS	NS	0.0013 J	0.0018 U	0.0021 U	0.0024 U	0.00056 J	0.0024 UJ
2,2-Dichloropropane	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
2-Chlorotoluene	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
2-Hexanone	NS	NS	NS	0.0091 U	0.0091 U	0.01 U	0.012 U	0.0098 U	0.012 U
4-Chlorotoluene	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
4-Ethyltoluene	NS	NS	NS	0.00051 J	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Acetone	**0.03**	100	0.03	0.0091 U	0.0064 J	0.01 U	**0.078 J**	0.017 J	**0.16 J**
Acrylonitrile	NS	NS	NS	0.0036 U	0.0036 U	0.0042 U	0.0047 U	0.0039 U	0.0047 U
Benzene	**0.06**	3.7	0.06	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
Bromobenzene	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Bromochloromethane	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Bromodichloromethane	NS	NS	NS	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
Bromoform	NS	NS	NS	0.0036 U	0.0036 U	0.0042 U	0.0047 U	0.0039 U	0.0047 U
Bromomethane	NS	NS	NS	0.0018 UJ	0.0018 U	0.0021 UJ	0.0024 UJ	0.002 UJ	0.0024 UJ
Carbon Disulfide	NS	NS	NS	0.0091 U	0.0091 U	0.01 U	0.012 U	0.0098 U	0.012 U
Carbon Tetrachloride	0.76	7.1	0.76	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Chlorobenzene	**1.1**	100	1.1	0.00059	0.00046 U	0.00016 J	0.00059 U	0.00049 U	0.00059 U
Chloroethane	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Chloroform	0.37	24	0.37	0.0014 U	0.0014 U	0.0016 U	0.0018 U	0.0015 U	0.0018 U
Chloromethane	NS	NS	NS	0.0036 U	0.0036 U	0.0042 U	0.0047 U	0.0039 U	0.0047 U
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
Cymene	NS	NS	NS	0.00016 J	0.00018 J	0.001 U	0.0012 U	0.00098 U	0.0012 U
Dibromochloromethane	NS	NS	NS	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Dibromomethane	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Dichlorodifluoromethane	NS	NS	NS	0.0091 U	0.0091 U	0.01 U	0.012 U	0.0098 U	0.012 U
Dichloroethylenes	NS	NS	NS	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.0018 U	0.0018 U	0.0021 U	0.0024 UJ	0.002 UJ	0.0024 UJ
Ethylbenzene	1	76	1	0.00018 J	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Isopropylbenzene (Cumene)	NS	NS	NS	0.00012 J	0.00091 U	0.001 U	0.0012 U	0.00024 J	0.0012 UJ
M,P-Xylenes	NS	NS	NS	0.0015 J	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.0091 U	0.0091 U	0.01 U	0.012 U	0.0098 U	0.041 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.0091 U	0.0091 U	0.01 U	0.012 U	0.0098 U	0.012 U
Methylene Chloride	**0.05**	81	0.05	0.0045 U	0.0046 U	0.0053 U	0.0059 U	0.0049 U	0.0059 U
N-Butylbenzene	18	100	18	0.00027 H	0.00091 U	0.001 U	0.0012 U	0.00016 J	0.0012 UJ
N-Propylbenzene	5	100	5	0.00016 J	0.00091 U	0.001 U	0.0012 U	0.00046 J	0.0012 UJ
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	0.00069 J	0.0003 J	0.001 U	0.0012 U	0.00098 U	0.0012 U
Sec-Butylbenzene	25	100	25	0.00027 J	0.00091 U	0.001 U	0.0012 U	0.00019 J	0.0012 UJ
Styrene	NS	NS	NS	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
T-Butylbenzene	11	100	11	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.0018 U	0.0018 U	0.0021 U	0.0024 U	0.002 U	0.0024 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.00055	0.0011	0.00053 U	0.00059 U	0.00049 U	0.00059 U
Toluene	0.7	100	0.7	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.0014 U	0.0014 U	0.0016 U	0.0018 U	0.0015 U	0.0018 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.0045 U	0.0046 U	0.0053 U	0.0059 UJ	0.0049 UJ	0.0059 UJ
Trichloroethylene (TCE)	0.47	6.4	0.47	0.00045 U	0.00046 U	0.00053 U	0.00059 U	0.00049 U	0.00059 U
Trichlorofluoromethane	NS	NS	NS	0.0036 U	0.0036 U	0.0042 U	0.0047 U	0.0039 U	0.0047 U
Vinyl Acetate	NS	NS	NS	0.0091 U	0.0091 U	0.01 U	0.012 U	0.0098 U	0.012 U
Vinyl Chloride	0.02	0.48	0.03	0.00091 U	0.00091 U	0.001 U	0.0012 U	0.00098 U	0.0012 U
Xylenes, Total	**0.26**	100	1.2	0.0022 J	0.0003 J	0.001 U	0.0012 U	0.00098 U	0.0012 U

Table 2
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results
Volatile Organic Compounds

			AKRF Sample ID	SW-08_17_20240117	SW-09_17_20240123	SW-10_15_20240126	SW-11_17_20240126	SW-12_17_20240126	SW-13_15_20240126
			Laboratory Sample ID	L2402735-05	L2403778-03	L2404658-01	L2404658-02	L2404658-03	L2404658-04
			Date Sampled	1/17/2024	1/23/2024	1/26/2024	1/26/2024	1/26/2024	1/26/2024
			Dilution Factor	1	1	1	1	1	1
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.00058 U	0.00069 UJ	0.00046 U	0.00048 U	0.00049 U	0.00054 U
1,1,1-Trichloroethane	0.68	100	0.68	0.00058 U	0.00069 U	0.00046 U	0.00048 U	0.00049 U	0.00054 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.00058 U	0.00069 UJ	0.00046 U	0.00048 U	0.00049 U	0.00054 U
1,1,2-Trichloroethane	NS	NS	NS	0.0012 U	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
1,1-Dichloroethane	0.27	47	0.27	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
1,1-Dichloroethene	0.24	0.98	0.33	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
1,1-Dichloropropene	NS	NS	NS	0.00058 U	0.00069 U	0.00046 U	0.00048 U	0.00049 U	0.00054 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,2,3-Trichloropropane	NS	NS	NS	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	0.00057 J	0.0014 J	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,2,4-Trichlorobenzene	NS	NS	NS	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	0.0064	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.0035 U	0.0041 UJ	0.0028 U	0.0029 U	0.0029 U	0.0032 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.0012 U	0.0014 UJ	0.00093 UJ	0.00096 UJ	0.00098 UJ	0.0011 UJ
1,2-Dichlorobenzene	**1.1**	100	1.1	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,2-Dichloroethane	0.02	5.8	0.02	0.0012 U	0.0014 U	0.00093 UJ	0.00096 UJ	0.00098 UJ	0.0011 UJ
1,2-Dichloropropane	NS	NS	NS	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	0.0024	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,3-Dichlorobenzene	2.4	38	2.6	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,3-Dichloropropane	NS	NS	NS	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,4-Dichlorobenzene	1.8	24	1.8	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
1,4-Diethyl Benzene	NS	NS	NS	0.0049	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
2,2-Dichloropropane	NS	NS	NS	0.0023 U	0.0028 U	0.0018 U	0.0019 U	0.002 U	0.0021 U
2-Chlorotoluene	NS	NS	NS	0.0023 U	0.0028 U	0.0018 U	0.0019 U	0.002 U	0.0021 U
2-Hexanone	NS	NS	NS	0.012 U	0.014 UJ	0.0093 U	0.0096 U	0.0098 U	0.011 U
4-Chlorotoluene	NS	NS	NS	0.0023 U	0.0028 U	0.0018 U	0.0019 U	0.002 U	0.0021 U
4-Ethyltoluene	NS	NS	NS	0.0027	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
Acetone	**0.03**	100	0.03	0.026 J	0.014 UJ	0.022	0.016	0.022	**0.039**
Acrylonitrile	NS	NS	NS	0.0047 U	0.0055 U	0.0037 U	0.0038 U	0.0039 U	0.0043 U
Benzene	**0.06**	3.7	0.06	0.00033 J	0.00069 U	0.00018 J	0.00048 U	0.00049 U	0.00024 J
Bromobenzene	NS	NS	NS	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
Bromochloromethane	NS	NS	NS	0.0023 U	0.0028 U	0.0018 U	0.0019 U	0.002 U	0.0021 U
Bromodichloromethane	NS	NS	NS	0.00058 U	0.00069 UJ	0.00046 U	0.00048 U	0.00049 U	0.00054 U
Bromoform	NS	NS	NS	0.0047 U	0.0055 UJ	0.0037 U	0.0038 U	0.0039 U	0.0043 U
Bromomethane	NS	NS	NS	0.0023 UJ	0.0028 U	0.0018 UJ	0.0019 UJ	0.002 UJ	0.0021 UJ
Carbon Disulfide	NS	NS	NS	0.012 U	0.014 UJ	0.0093 U	0.0096 U	0.0098 U	0.011 U
Carbon Tetrachloride	0.76	7.1	0.76	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Chlorobenzene	**1.1**	100	1.1	0.00058 U	0.00069 UJ	0.00046 U	0.00048 U	0.00049 U	0.00054 U
Chloroethane	NS	NS	NS	0.0023 U	0.0028 U	0.0018 U	0.0019 U	0.002 U	0.0021 U
Chloroform	0.37	24	0.37	0.0018 U	0.0021 U	0.0014 U	0.0014 U	0.0015 U	0.0016 U
Chloromethane	NS	NS	NS	0.0047 U	0.0055 U	0.0037 U	0.0038 U	0.0039 U	0.0043 U
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.00058 U	0.00069 UJ	0.00046 U	0.00048 U	0.00049 U	0.00054 U
Cymene	NS	NS	NS	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Dibromochloromethane	NS	NS	NS	0.0012 U	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Dibromomethane	NS	NS	NS	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
Dichlorodifluoromethane	NS	NS	NS	0.012 U	0.014 U	0.0093 UJ	0.0096 UJ	0.0098 UJ	0.011 UJ
Dichloroethylenes	NS	NS	NS	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.0023 UJ	0.0028 U	0.0018 UJ	0.0019 UJ	0.002 UJ	0.0021 UJ
Ethylbenzene	1	76	1	0.0015	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Isopropylbenzene (Cumene)	NS	NS	NS	0.0015	0.0014 UJ	0.00093 U	0.00018 J	0.00098 U	0.0011 U
M,P-Xylenes	NS	NS	NS	0.0013 J	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.012 U	0.014 UJ	0.0035 J	0.0032 J	0.0038 J	0.0074 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.012 U	0.014 U	0.0093 U	0.0096 U	0.0098 U	0.011 U
Methylene Chloride	**0.05**	81	0.05	0.0058 U	0.0069 U	0.0046 UJ	0.0048 UJ	0.0049 UJ	0.0054 UJ
N-Butylbenzene	18	100	18	0.0012 U	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
N-Propylbenzene	5	100	5	0.0026	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	0.00057 J	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Sec-Butylbenzene	25	100	25	0.00041 J	0.00036 J	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Styrene	NS	NS	NS	0.0012 U	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
T-Butylbenzene	11	100	11	0.0023 U	0.0028 UJ	0.0018 U	0.0019 U	0.002 U	0.0021 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.0023 U	0.0028 U	0.0018 U	0.0019 U	0.002 U	0.0021 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.00058 U	0.00069 UJ	0.00046 U	0.00048 U	0.00049 U	0.00054 U
Toluene	0.7	100	0.7	0.0012 U	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.00058 U	0.00069 U	0.00046 U	0.00048 U	0.00049 U	0.00054 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.0018 U	0.0021 U	0.0014 U	0.0014 U	0.0015 U	0.0016 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.0012 U	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.0058 UJ	0.0069 UJ	0.0046 UJ	0.0048 UJ	0.0049 UJ	0.0054 UJ
Trichloroethylene (TCE)	0.47	6.4	0.47	0.00058 U	0.00069 U	0.00046 U	0.00048 U	0.00049 U	0.00054 U
Trichlorofluoromethane	NS	NS	NS	0.0047 U	0.0055 U	0.0037 UJ	0.0038 UJ	0.0039 UJ	0.0043 UJ
Vinyl Acetate	NS	NS	NS	0.012 U	0.014 UJ	0.0093 U	0.0096 U	0.0098 U	0.011 U
Vinyl Chloride	0.02	0.48	0.03	0.0012 U	0.0014 U	0.00093 U	0.00096 U	0.00098 U	0.0011 U
Xylenes, Total	**0.26**	100	1.2	0.0019 J	0.0014 UJ	0.00093 U	0.00096 U	0.00098 U	0.0011 U

Table 2
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results
Volatile Organic Compounds

			AKRF Sample ID	SW-14_17_20240126	SW-15_17_20240126	SW-16_17_20240129	SW-17_17_20240131	UST-B_8_20231018	UST-X_20231018
			Laboratory Sample ID	L2404658-05	L2404658-06	L2404867-01	L2405262-02	L2359312-13	L2359312-14
			Date Sampled	1/26/2024	1/26/2024	1/29/2024	1/31/2024	10/18/2023	10/18/2023
			Dilution Factor	1	1	1	1	1	1
			Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
1,1,1-Trichloroethane	0.68	100	0.68	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
1,1,2-Trichloroethane	NS	NS	NS	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
1,1-Dichloroethane	0.27	47	0.27	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
1,1-Dichloroethene	0.24	0.98	0.33	0.00091 U	0.001 U	0.0009 UJ	0.00095 U	0.0014 UJ	0.0015 UJ
1,1-Dichloropropene	NS	NS	NS	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
1,2,3-Trichloropropane	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	0.0018 U	0.0021 U	0.003	0.00086 J	0.0028 U	0.003 U
1,2,4-Trichlorobenzene	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	0.0018 U	0.0021 U	0.0021	0.00041 J	0.0028 U	0.003 U
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.0027 U	0.0031 U	0.0027 U	0.0028 U	0.0041 U	0.0045 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.00091 U	0.001 UJ	0.0009 U	0.00095 U	0.0014 U	0.0015 U
1,2-Dichlorobenzene	**1.1**	100	1.1	0.0018 U	0.0021 U	0.00077 J	0.0019 U	0.0028 U	0.003 U
1,2-Dichloroethane	0.02	5.8	0.02	0.00091 U	0.001 UJ	0.0009 U	0.00095 UJ	0.0014 U	0.0015 U
1,2-Dichloropropane	NS	NS	NS	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	0.0018 U	0.0021 U	0.00037 J	0.0019 U	0.0028 U	0.003 U
1,3-Dichlorobenzene	2.4	38	2.6	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
1,3-Dichloropropane	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
1,4-Dichlorobenzene	1.8	24	1.8	0.0018 U	0.0021 U	0.00024 J	0.0019 U	0.0028 U	0.003 U
1,4-Diethyl Benzene	NS	NS	NS	0.0018 U	0.0021 U	0.00047 J	0.00033 J	0.0028 U	0.003 U
2,2-Dichloropropane	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
2-Chlorotoluene	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
2-Hexanone	NS	NS	NS	0.0091 U	0.01 U	0.009 UJ	0.0095 U	0.014 U	0.015 U
4-Chlorotoluene	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
4-Ethyltoluene	NS	NS	NS	0.0018 U	0.0021 U	0.00064 J	0.0019 U	0.0028 U	0.003 U
Acetone	**0.03**	100	0.03	**0.065**	0.012	0.02	**0.051**	0.014 UJ	0.015 UJ
Acrylonitrile	NS	NS	NS	0.0036 U	0.0041 U	0.0036 U	0.0038 U	0.0055 U	0.006 U
Benzene	**0.06**	3.7	0.06	0.00045 U	0.00052 U	0.00045 U	0.00027 J	0.00069 U	0.00075 U
Bromobenzene	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
Bromochloromethane	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
Bromodichloromethane	NS	NS	NS	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
Bromoform	NS	NS	NS	0.0036 U	0.0041 U	0.0036 U	0.0038 U	0.0055 U	0.006 U
Bromomethane	NS	NS	NS	0.0018 U	0.0021 UJ	0.0018 U	0.0019 U	0.0028 UJ	0.003 UJ
Carbon Disulfide	NS	NS	NS	0.0091 UJ	0.01 U	0.009 UJ	0.0095 U	0.014 UJ	0.015 UJ
Carbon Tetrachloride	0.76	7.1	0.76	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 UJ	0.0015 UJ
Chlorobenzene	**1.1**	100	1.1	0.00045 U	0.00052 U	0.00075	0.00061	0.00069 U	0.00075 U
Chloroethane	NS	NS	NS	0.0018 U	0.0021 U	0.0018 UJ	0.0019 U	0.0028 UJ	0.003 UJ
Chloroform	0.37	24	0.37	0.0014 U	0.0015 U	0.0013 U	0.0014 U	0.0021 U	0.0022 U
Chloromethane	NS	NS	NS	0.0036 U	0.0041 U	0.0036 U	0.0038 U	0.0055 UJ	0.006 UJ
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
Cymene	NS	NS	NS	0.00091 U	0.001 U	0.00018 J	0.00054 J	0.0014 U	0.0015 U
Dibromochloromethane	NS	NS	NS	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
Dibromomethane	NS	NS	NS	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
Dichlorodifluoromethane	NS	NS	NS	0.0091 U	0.01 UJ	0.009 U	0.0095 UJ	0.014 UJ	0.015 UJ
Dichloroethylenes	NS	NS	NS	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.0018 U	0.0021 UJ	0.0018 UJ	0.0019 U	0.0028 U	0.003 U
Ethylbenzene	1	76	1	0.00091 U	0.001 U	0.0009 U	0.00013 J	0.0014 U	0.0015 U
Isopropylbenzene (Cumene)	NS	NS	NS	0.00091 U	0.001 U	0.00023 J	0.00062 J	0.0014 U	0.0015 U
M,P-Xylenes	NS	NS	NS	0.0018 U	0.0021 U	0.00055 J	0.001 J	0.0028 U	0.003 U
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.0091 U	0.01 U	0.0026 J	0.0047 J	0.014 UJ	0.015 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.0091 U	0.01 U	0.009 UJ	0.0095 U	0.014 U	0.015 U
Methylene Chloride	**0.05**	81	0.05	0.0045 U	0.0052 UJ	0.0045 U	0.0047 U	0.0069 U	0.0075 U
N-Butylbenzene	18	100	18	0.00091 U	0.001 U	0.0012	0.00043 J	0.0014 U	0.0015 U
N-Propylbenzene	5	100	5	0.00091 U	0.001 U	0.00039 J	0.00095 U	0.0014 U	0.0015 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	0.00091 U	0.001 U	0.0011 H	0.00075 J	0.0014 U	0.0015 U
Sec-Butylbenzene	25	100	25	0.00091 U	0.001 U	0.0006 J	0.00052 J	0.0014 U	0.0015 U
Styrene	NS	NS	NS	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
T-Butylbenzene	11	100	11	0.0018 U	0.0021 U	0.0018 U	0.0019 U	0.0028 U	0.003 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.0018 U	0.0021 U	0.0018 U	0.00047 J	0.0028 U	0.003 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.0021	0.0024
Toluene	0.7	100	0.7	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.0014 U	0.0015 U	0.0013 U	0.0014 U	0.0021 U	0.0022 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 U	0.0015 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.0045 U	0.0052 UJ	0.0045 UJ	0.0047 U	0.0069 U	0.0075 U
Trichloroethylene (TCE)	0.47	6.4	0.47	0.00045 U	0.00052 U	0.00045 U	0.00047 U	0.00069 U	0.00075 U
Trichlorofluoromethane	NS	NS	NS	0.0036 U	0.0041 UJ	0.0036 UJ	0.0038 U	0.0055 UJ	0.006 UJ
Vinyl Acetate	NS	NS	NS	0.0091 U	0.01 U	0.009 U	0.0095 U	0.014 UJ	0.015 UJ
Vinyl Chloride	0.02	0.48	0.03	0.00091 U	0.001 U	0.0009 U	0.00095 U	0.0014 UJ	0.0015 UJ
Xylenes, Total	**0.26**	100	1.2	0.00091 U	0.001 U	0.0017 H	0.0018 J	0.0014 U	0.0015 U

Table 2
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results
Volatile Organic Compounds

AKRF Sample ID				UST-EW_7_20231018	UST-NW_7_20231018	UST-SW_7_20231018	UST-WW_7_20231018
Laboratory Sample ID				L2359312-12	L2359312-09	L2359312-10	L2359312-11
Date Sampled				10/18/2023	10/18/2023	10/18/2023	10/18/2023
Dilution Factor				1	1	1	1
Unit				mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	**NYSDEC PGWSCO**	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1,2-Tetrachloroethane	NS	NS	NS	0.00053 U	0.00066 U	0.0006 U	0.0006 U
1,1,1-Trichloroethane	0.68	100	0.68	0.00053 U	0.00066 U	0.0006 U	0.0006 U
1,1,2,2-Tetrachloroethane	NS	NS	NS	0.00053 U	0.00066 UJ	0.0006 U	0.0006 U
1,1,2-Trichloroethane	NS	NS	NS	0.001 U	0.0013 U	0.0012 U	0.0012 U
1,1-Dichloroethane	0.27	47	0.27	0.001 U	0.0013 U	0.0012 U	0.0012 U
1,1-Dichloroethene	0.24	0.98	0.33	0.001 UJ	0.0013 U	0.0012 UJ	0.0012 U
1,1-Dichloropropene	NS	NS	NS	0.00053 U	0.00066 U	0.0006 U	0.0006 U
1,2,3-Trichlorobenzene	NS	NS	NS	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
1,2,3-Trichloropropane	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 U
1,2,4,5-Tetramethylbenzene	NS	NS	NS	0.00094 J	0.00078 J	0.00044 J	0.0024 U
1,2,4-Trichlorobenzene	NS	NS	NS	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
1,2,4-Trimethylbenzene	**0.51**	0.52	5.9	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
1,2-Dibromo-3-Chloropropane	NS	NS	NS	0.0032 U	0.004 U	0.0036 U	0.0036 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	NS	0.001 U	0.0013 U	0.0012 U	0.0012 UJ
1,2-Dichlorobenzene	**1.1**	100	1.1	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
1,2-Dichloroethane	0.02	5.8	0.02	0.001 U	0.0013 U	0.0012 U	0.0012 U
1,2-Dichloropropane	NS	NS	NS	0.001 U	0.0013 U	0.0012 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	**0.51**	0.52	3.1	0.0021 U	0.00038 J	0.0024 U	0.0024 U
1,3-Dichlorobenzene	2.4	38	2.6	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
1,3-Dichloropropane	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 U
1,4-Dichlorobenzene	1.8	24	1.8	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
1,4-Diethyl Benzene	NS	NS	NS	0.0021 U	0.0016 J	0.001 J	0.0024 U
2,2-Dichloropropane	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 U
2-Chlorotoluene	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 U
2-Hexanone	NS	NS	NS	0.01 U	0.013 UJ	0.012 U	0.012 U
4-Chlorotoluene	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 U
4-Ethyltoluene	NS	NS	NS	0.00058 J	0.0026 UJ	0.0024 U	0.0024 U
Acetone	**0.03**	100	0.03	0.01 UJ	0.013 U	0.012 UJ	0.012 UJ
Acrylonitrile	NS	NS	NS	0.0042 U	0.0053 U	0.0048 U	0.0048 U
Benzene	**0.06**	3.7	0.06	0.00053 U	0.00066 U	0.0006 U	0.0006 U
Bromobenzene	NS	NS	NS	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
Bromochloromethane	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 U
Bromodichloromethane	NS	NS	NS	0.00053 U	0.00066 U	0.0006 U	0.0006 U
Bromoform	NS	NS	NS	0.0042 U	0.0053 UJ	0.0048 U	0.0048 U
Bromomethane	NS	NS	NS	0.0021 UJ	0.0026 U	0.0024 UJ	0.0024 U
Carbon Disulfide	NS	NS	NS	0.01 UJ	0.013 U	0.012 UJ	0.012 U
Carbon Tetrachloride	0.76	7.1	0.76	0.001 UJ	0.0013 U	0.0012 UJ	0.0012 U
Chlorobenzene	**1.1**	100	1.1	0.00053 U	0.00066 UJ	0.0006 U	0.0006 U
Chloroethane	NS	NS	NS	0.0021 UJ	0.0026 U	0.0024 UJ	0.0024 U
Chloroform	0.37	24	0.37	0.0016 U	0.002 U	0.0018 U	0.0018 U
Chloromethane	NS	NS	NS	0.0042 UJ	0.0053 U	0.0048 UJ	0.0048 U
Cis-1,2-Dichloroethylene	0.19	41	0.19	0.001 U	0.0013 U	0.0012 U	0.0012 U
Cis-1,3-Dichloropropene	NS	NS	NS	0.00053 U	0.00066 U	0.0006 U	0.0006 U
Cymene	NS	NS	NS	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
Dibromochloromethane	NS	NS	NS	0.001 U	0.0013 U	0.0012 U	0.0012 U
Dibromomethane	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 U
Dichlorodifluoromethane	NS	NS	NS	0.01 UJ	0.013 U	0.012 UJ	0.012 U
Dichloroethylenes	NS	NS	NS	0.001 U	0.0013 U	0.0012 U	0.0012 U
Diethyl Ether (Ethyl Ether)	NS	NS	NS	0.0021 U	0.0026 U	0.0024 U	0.0024 UJ
Ethylbenzene	1	76	1	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
Isopropylbenzene (Cumene)	NS	NS	NS	0.001 U	0.0013 U	0.0012 U	0.0012 U
M,P-Xylenes	NS	NS	NS	0.0021 U	0.0026 UJ	0.0024 U	0.0024 U
Methyl Ethyl Ketone (2-Butanone)	0.1	100	0.1	0.01 UJ	0.013 U	0.012 UJ	0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	NS	0.01 U	0.013 U	0.012 U	0.012 U
Methylene Chloride	**0.05**	81	0.05	0.0053 U	0.0066 U	0.006 U	0.006 U
N-Butylbenzene	18	100	18	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
N-Propylbenzene	5	100	5	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	NS	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
Sec-Butylbenzene	25	100	25	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
Styrene	NS	NS	NS	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
T-Butylbenzene	11	100	11	0.0021 U	0.0026 U	0.0024 U	0.0024 U
Tert-Butyl Methyl Ether	0.1	100	0.1	0.0021 U	0.0026 U	0.0024 U	0.0024 U
Tetrachloroethylene (PCE)	1.3	18	1.3	0.002	0.014 L	0.0026	0.0022
Toluene	0.7	100	0.7	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	NS	NS	NS	0.00053 U	0.00066 U	0.0006 U	0.0006 U
Trans-1,2-Dichloroethene	0.19	100	0.19	0.0016 U	0.002 U	0.0018 U	0.0018 U
Trans-1,3-Dichloropropene	NS	NS	NS	0.001 U	0.0013 UJ	0.0012 U	0.0012 U
Trans-1,4-Dichloro-2-Butene	NS	NS	NS	0.0053 U	0.0066 UJ	0.006 U	0.006 U
Trichloroethylene (TCE)	0.47	6.4	0.47	0.00053 U	0.00066 U	0.0006 U	0.0006 U
Trichlorofluoromethane	NS	NS	NS	0.0042 UJ	0.0053 U	0.0048 UJ	0.0048 U
Vinyl Acetate	NS	NS	NS	0.01 UJ	0.013 UJ	0.012 U	0.012 UJ
Vinyl Chloride	0.02	0.48	0.03	0.001 UJ	0.0013 U	0.0012 UJ	0.0012 UJ
Xylenes, Total	**0.26**	100	1.2	0.001 U	0.0013 UJ	0.0012 U	0.0012 U

Table 3
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results
Semivolatile Organic Compounds

		AKRF Sample ID	BS-01_15_20231212	BS-02_15_20231212	BS-03_15_20231212	BS-04_17_20240117	BS-05_17_20240117	BS-06_17_20240123
		Laboratory Sample ID	L2373009-06	L2373009-07	L2373009-08	L2402735-03	L2402735-04	L2403778-01
		Date Sampled	12/12/2023	12/12/2023	12/12/2023	1/17/2024	1/17/2024	1/23/2024
		Dilution Factor	1	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.19 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	0.028 UJ	0.028 UJ	0.028 UJ	0.03 UJ	0.029 UJ	0.028 U
2,4,5-Trichlorophenol	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.19 U	0.19 U
2,4,6-Trichlorophenol	NS	NS	0.11 UJ	0.11 UJ	0.11 UJ	0.12 U	0.12 U	0.11 U
2,4-Dichlorophenol	NS	NS	0.17 UJ	0.17 UJ	0.17 UJ	0.18 U	0.17 U	0.17 U
2,4-Dimethylphenol	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
2,4-Dinitrophenol	NS	NS	0.9 UJ	0.9 UJ	0.91 UJ	0.96 UJ	0.92 UJ	0.91 U
2,4-Dinitrotoluene	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
2,6-Dinitrotoluene	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.19 U	0.19 U
2-Chloronaphthalene	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
2-Chlorophenol	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.19 U	0.19 U
2-Methylnaphthalene	NS	NS	0.2 J	0.1 J	0.067 J	0.24 UJ	0.23 UJ	0.23 U
2-Methylphenol (O-Cresol)	0.33	100	0.19 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ	0.19 U
2-Nitroaniline	NS	NS	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U
2-Nitrophenol	NS	NS	0.41 UJ	0.4 UJ	0.41 UJ	0.43 U	0.41 U	0.41 U
3- And 4- Methylphenol (Total)	NS	NS	0.27 U	0.27 U	0.27 U	0.29 U	0.28 U	0.27 U
3,3'-Dichlorobenzidine	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 UJ
3-Nitroaniline	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
4,6-Dinitro-2-Methylphenol	NS	NS	0.49 UJ	0.49 UJ	0.49 UJ	0.52 U	0.5 U	0.49 U
4-Bromophenyl Phenyl Ether	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
4-Chloro-3-Methylphenol	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.19 U	0.19 U
4-Chloroaniline	NS	NS	0.19 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ	0.19 UJ
4-Chlorophenyl Phenyl Ether	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
4-Nitroaniline	NS	NS	0.19 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ	0.19 U
4-Nitrophenol	NS	NS	0.26 UJ	0.26 UJ	0.26 UJ	0.28 UJ	0.27 UJ	0.26 UJ
Acenaphthene	20	100	0.034 J	0.15 UJ	0.15 UJ	0.16 UJ	0.063 J	0.15 U
Acenaphthylene	100	100	0.15 UJ	0.15 UJ	0.15 UJ	0.16 UJ	0.15 UJ	0.15 U
Acetophenone	NS	NS	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U
Anthracene	100	100	0.037 J	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Benzo(a)Anthracene	**1**	1.4	0.044 J	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Benzo(a)Pyrene	**1**	1	0.15 UJ	0.15 UJ	0.15 UJ	0.16 UJ	0.15 UJ	0.15 UJ
Benzo(b)Fluoranthene	**1**	1.4	0.048 J	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Benzo(g,h,i)Perylene	**0.64**	4.9	0.028 J	0.15 UJ	0.15 UJ	0.16 UJ	0.15 UJ	0.15 UJ
Benzo(k)Fluoranthene	**0.8**	4.9	0.11 UJ	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Benzoic Acid	NS	NS	0.61 R	0.61 R	0.61 R	0.65 UJ	0.62 UJ	0.61 U
Benzyl Alcohol	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.19 U	0.19 U
Benzyl Butyl Phthalate	NS	NS	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 UJ
Biphenyl (Diphenyl)	NS	NS	0.43 UJ	0.43 UJ	0.43 UJ	0.46 U	0.44 U	0.43 U
Bis(2-Chloroethoxy) Methane	NS	NS	0.2 UJ	0.2 UJ	0.2 UJ	0.22 UJ	0.21 UJ	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.17 UJ	0.17 UJ	0.17 UJ	0.18 UJ	0.17 UJ	0.17 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.23 U	0.22 U	0.23 U	0.24 UJ	0.23 UJ	0.23 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.35	0.19 U	0.19 U	0.2 U	0.19 U	0.19 UJ
Carbazole	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
Chrysene	**1**	4.9	0.045 J	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Dibenz(a,h)Anthracene	**0.33**	0.33	0.11 UJ	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Dibenzofuran	**2.1**	18	0.048 J	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
Diethyl Phthalate	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
Dimethyl Phthalate	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.2 L	0.19 U
Di-N-Butyl Phthalate	NS	NS	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U
Di-N-Octylphthalate	NS	NS	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 UJ
Fluoranthene	**85**	100	0.073 J	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Fluorene	30	100	0.094 J	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
Hexachlorobenzene	0.33	0.33	0.11 U	0.11 U	0.11 U	0.12 UJ	0.12 UJ	0.11 U
Hexachlorobutadiene	NS	NS	0.19 UJ	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
Hexachlorocyclopentadiene	NS	NS	0.54 U	0.54 U	0.54 U	0.57 UJ	0.55 UJ	0.54 U
Hexachloroethane	NS	NS	0.15 UJ	0.15 UJ	0.15 UJ	0.16 UJ	0.15 UJ	0.15 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	0.15 UJ	0.15 UJ	0.15 UJ	0.16 UJ	0.15 UJ	0.15 U
Isophorone	NS	NS	0.17 U	0.17 U	0.17 U	0.18 UJ	0.17 UJ	0.17 U
Naphthalene	12	100	0.059 J	0.19 UJ	0.19 UJ	0.2 UJ	0.19 UJ	0.19 U
Nitrobenzene	0.08	1.8	0.17 UJ	0.17 UJ	0.17 UJ	0.18 U	0.17 U	0.17 U
N-Nitrosodi-N-Propylamine	NS	NS	0.19 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ	0.19 U
N-Nitrosodiphenylamine	NS	NS	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
Pentachlorophenol	0.8	1.3	0.15 UJ	0.15 UJ	0.15 UJ	0.16 U	0.15 U	0.15 U
Phenanthrene	**1.1**	4.9	0.19 J	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ	0.11 UJ
Phenol	**0.33**	100	0.19 UJ	0.19 UJ	0.19 UJ	0.2 U	0.19 U	0.19 U
Pyrene	**64**	100	0.12 J	0.02 J	0.021 J	0.12 UJ	0.12 UJ	0.11 UJ

Table 3
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results

Semivolatile Organic Compounds

		AKRF Sample ID	BS-07_17_20240123	BS-08_17_20240126	BS-09_17_20240126	BS-10_17_20240129	BS-11_17_20240131	EP-01_2_20231005
		Laboratory Sample ID	L2403778-02	L2404658-07	L2404658-08	L2404867-02	L2405262-01	L2359312-01
		Date Sampled	1/23/2024	1/26/2024	1/26/2024	1/29/2024	1/31/2024	10/05/2023
		Dilution Factor	1	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	0.028 U	0.03 UJ	0.029 UJ	0.029 UJ	0.03 UJ	0.029 UJ
2,4,5-Trichlorophenol	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
2,4,6-Trichlorophenol	NS	NS	0.11 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
2,4-Dichlorophenol	NS	NS	0.16 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U
2,4-Dimethylphenol	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
2,4-Dinitrophenol	NS	NS	0.88 U	0.95 U	0.94 U	0.92 U	0.95 UJ	0.92 U
2,4-Dinitrotoluene	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
2,6-Dinitrotoluene	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
2-Chloronaphthalene	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
2-Chlorophenol	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
2-Methylnaphthalene	NS	NS	0.22 U	0.24 U	0.23 U	0.23 U	0.24 U	0.62
2-Methylphenol (O-Cresol)	0.33	100	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.05 J
2-Nitroaniline	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
2-Nitrophenol	NS	NS	0.4 U	0.43 U	0.42 U	0.42 U	0.43 U	0.42 U
3- And 4- Methylphenol (Total)	NS	NS	0.26 U	0.28 U	0.28 U	0.28 U	0.28 U	0.22 J
3,3'-Dichlorobenzidine	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ
3-Nitroaniline	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 UJ	0.19 U
4,6-Dinitro-2-Methylphenol	NS	NS	0.48 U	0.52 U	0.51 UJ	0.5 U	0.51 U	0.5 U
4-Bromophenyl Phenyl Ether	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
4-Chloro-3-Methylphenol	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
4-Chloroaniline	NS	NS	0.18 UJ	0.2 U	0.19 U	0.19 U	0.2 UJ	0.19 U
4-Chlorophenyl Phenyl Ether	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
4-Nitroaniline	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
4-Nitrophenol	NS	NS	0.26 UJ	0.28 U	0.27 U	0.27 U	0.28 U	0.27 U
Acenaphthene	20	100	0.15 U	0.16 U	0.16 U	0.15 U	0.16 U	1.7
Acenaphthylene	100	100	0.15 U	0.16 U	0.16 U	0.15 U	0.16 U	2.1
Acetophenone	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
Anthracene	100	100	0.11 UJ	0.12 U	0.12 U	0.12 U	0.12 U	5.3
Benzo(a)Anthracene	**1**	1.4	0.11 UJ	0.12 U	0.12 U	0.049 J	0.12 UJ	NR
Benzo(a)Pyrene	**1**	1	0.15 UJ	0.16 U	0.16 U	0.15 U	0.16 UJ	NR
Benzo(b)Fluoranthene	**1**	1.4	0.11 UJ	0.12 U	0.12 U	0.046 J	0.12 UJ	NR
Benzo(g,h,i)Perylene	**0.64**	4.9	0.15 U	0.16 U	0.16 U	0.15 U	0.16 UJ	**7.2 L**
Benzo(k)Fluoranthene	**0.8**	4.9	0.11 U	0.12 U	0.12 U	0.12 U	0.12 UJ	**4.5 L**
Benzoic Acid	NS	NS	0.59 U	0.64 UJ	0.63 UJ	0.62 UJ	0.64 UJ	0.62 U
Benzyl Alcohol	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
Benzyl Butyl Phthalate	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ
Biphenyl (Diphenyl)	NS	NS	0.42 U	0.45 U	0.44 U	0.44 U	0.45 U	0.23 J
Bis(2-Chloroethoxy) Methane	NS	NS	0.2 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.16 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.22 UJ	0.24 U	0.23 U	0.23 UJ	0.24 U	0.23 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ
Carbazole	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1
Chrysene	**1**	4.9	0.11 UJ	0.12 U	0.12 U	0.045 J	0.12 UJ	NR
Dibenz(a,h)Anthracene	**0.33**	0.33	0.11 U	0.12 U	0.12 U	0.12 U	0.12 UJ	**1.9 L**
Dibenzofuran	**2.1**	18	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	1.4
Diethyl Phthalate	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
Dimethyl Phthalate	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
Di-N-Butyl Phthalate	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
Di-N-Octylphthalate	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 UJ	0.19 UJ
Fluoranthene	**85**	100	0.11 UJ	0.12 U	0.12 U	0.1 J	0.12 U	NR
Fluorene	30	100	0.18 U	0.2 U	0.19 U	0.026 J	0.2 U	2.1
Hexachlorobenzene	0.33	0.33	0.11 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Hexachlorobutadiene	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
Hexachlorocyclopentadiene	NS	NS	0.52 U	0.57 U	0.56 U	0.55 UJ	0.56 U	0.55 U
Hexachloroethane	NS	NS	0.15 U	0.16 U	0.16 U	0.15 U	0.16 U	0.15 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	0.15 U	0.16 U	0.16 U	0.15 U	0.16 UJ	NR
Isophorone	NS	NS	0.16 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U
Naphthalene	12	100	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	1.2
Nitrobenzene	0.08	1.8	0.16 U	0.18 U	0.18 U	0.17 U	0.18 U	0.17 U
N-Nitrosodi-N-Propylamine	NS	NS	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U
N-Nitrosodiphenylamine	NS	NS	0.15 U	0.16 U	0.16 U	0.15 U	0.16 U	0.15 U
Pentachlorophenol	0.8	1.3	0.15 U	0.16 U	0.16 UJ	0.15 U	0.16 U	0.15 U
Phenanthrene	**1.1**	4.9	0.11 UJ	0.12 U	0.12 U	0.1 J	0.12 U	NR
Phenol	**0.33**	100	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	0.14 J
Pyrene	**64**	100	0.11 UJ	0.12 U	0.12 U	0.1 J	0.12 UJ	NR

Table 3
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Soil Documentation Analytical Results

Semivolatile Organic Compounds

		AKRF Sample ID	EP-01_2_20231005	EP-02_2_20231005	EP-03_2_20231005	EP-04_2_20231005	EP-05_2_20231005	EP-06_2_20231005
		Laboratory Sample ID	L2359312-01	L2359312-02	L2359312-03	L2359312-04	L2359312-05	L2359312-06
		Date Sampled	10/05/2023	10/05/2023	10/05/2023	10/05/2023	10/05/2023	10/05/2023
		Dilution Factor	10	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	NR	0.028 UJ	0.029 UJ	0.03 UJ	0.028 UJ	0.029 UJ
2,4,5-Trichlorophenol	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2,4,6-Trichlorophenol	NS	NS	NR	0.11 U	0.12 U	0.12 U	0.11 U	0.12 U
2,4-Dichlorophenol	NS	NS	NR	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U
2,4-Dimethylphenol	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2,4-Dinitrophenol	NS	NS	NR	0.9 U	0.92 U	0.97 U	0.89 U	0.92 U
2,4-Dinitrotoluene	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2,6-Dinitrotoluene	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2-Chloronaphthalene	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2-Chlorophenol	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2-Methylnaphthalene	NS	NS	NR	0.036 J	0.041 J	0.084 J	0.22 U	0.23 U
2-Methylphenol (O-Cresol)	0.33	100	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2-Nitroaniline	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
2-Nitrophenol	NS	NS	NR	0.41 U	0.41 U	0.44 U	0.4 U	0.41 U
3- And 4- Methylphenol (Total)	NS	NS	NR	0.27 U	0.048 J	0.046 J	0.27 U	0.28 U
3,3'-Dichlorobenzidine	NS	NS	NR	0.19 UJ	0.19 UJ	0.2 UJ	0.18 UJ	0.19 UJ
3-Nitroaniline	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
4,6-Dinitro-2-Methylphenol	NS	NS	NR	0.49 U	0.5 U	0.52 U	0.48 U	0.5 U
4-Bromophenyl Phenyl Ether	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
4-Chloro-3-Methylphenol	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
4-Chloroaniline	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
4-Chlorophenyl Phenyl Ether	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
4-Nitroaniline	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
4-Nitrophenol	NS	NS	NR	0.26 U	0.27 U	0.28 U	0.26 U	0.27 U
Acenaphthene	20	100	NR	0.11 J	0.037 J	0.12 J	0.15 U	0.15 U
Acenaphthylene	100	100	NR	0.083 J	0.084 J	0.11 J	0.15 U	0.15 U
Acetophenone	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
Anthracene	100	100	NR	0.39	0.21	0.6	0.043 J	0.12 U
Benzo(a)Anthracene	**1**	1.4	**17 L**	**1.1 L**	**1.2 L**	**3.7 L**	0.28 L	0.089 J
Benzo(a)Pyrene	**1**	1	**16 L**	**1.2 L**	**1.4 L**	**3.9 L**	0.32 L	0.11 J
Benzo(b)Fluoranthene	**1**	1.4	**18 L**	**1.4 L**	**1.6 L**	**4.6 L**	0.39 L	0.12 L
Benzo(g,h,i)Perylene	**0.64**	4.9	NR	**0.72 L**	**0.76 L**	**2.3 L**	0.2 L	0.068 J
Benzo(k)Fluoranthene	**0.8**	4.9	NR	0.42 L	0.5 L	**1.2 L**	0.13 L	0.043 J
Benzoic Acid	NS	NS	NR	0.61 U	0.62 U	0.66 U	0.6 U	0.62 U
Benzyl Alcohol	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
Benzyl Butyl Phthalate	NS	NS	NR	0.19 UJ	0.17 J	0.2 UJ	0.18 UJ	0.19 UJ
Biphenyl (Diphenyl)	NS	NS	NR	0.43 U	0.44 U	0.46 U	0.42 U	0.44 U
Bis(2-Chloroethoxy) Methane	NS	NS	NR	0.2 U	0.21 U	0.22 U	0.2 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	NR	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U
Bis(2-Chloroisopropyl) Ether	NS	NS	NR	0.23 UJ	0.23 UJ	0.24 UJ	0.22 UJ	0.23 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	NR	0.19 UJ	0.19 UJ	0.11 J	0.088 J	0.19 UJ
Carbazole	NS	NS	NR	0.11 J	0.074 J	0.14 J	0.024 J	0.19 U
Chrysene	**1**	4.9	**17 L**	0.99 L	**1.1 L**	**3.4 L**	0.27 L	0.093 J
Dibenz(a,h)Anthracene	**0.33**	0.33	NR	0.16 L	0.19 L	**0.54 L**	0.054 J	0.12 UJ
Dibenzofuran	**2.1**	18	NR	0.072 J	0.074 J	0.098 J	0.18 U	0.19 U
Diethyl Phthalate	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
Dimethyl Phthalate	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
Di-N-Butyl Phthalate	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
Di-N-Octylphthalate	NS	NS	NR	0.19 UJ	0.19 UJ	0.2 UJ	0.18 UJ	0.19 UJ
Fluoranthene	**85**	100	36 L	2.3 L	2 L	6.7 L	0.46 L	0.17 L
Fluorene	30	100	NR	0.11 J	0.045 J	0.11 J	0.18 U	0.19 U
Hexachlorobenzene	0.33	0.33	NR	0.11 U	0.12 U	0.12 U	0.11 U	0.12 U
Hexachlorobutadiene	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
Hexachlorocyclopentadiene	NS	NS	NR	0.54 U	0.55 U	0.58 U	0.53 U	0.55 U
Hexachloroethane	NS	NS	NR	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	**9.1 L**	**0.88 L**	**0.97 L**	**2.8 L**	0.25 L	0.079 J
Isophorone	NS	NS	NR	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U
Naphthalene	12	100	NR	0.09 J	0.085 J	0.14 J	0.18 U	0.19 U
Nitrobenzene	0.08	1.8	NR	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U
N-Nitrosodi-N-Propylamine	NS	NS	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
N-Nitrosodiphenylamine	NS	NS	NR	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
Pentachlorophenol	0.8	1.3	NR	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
Phenanthrene	**1.1**	4.9	**28**	**1.5**	0.81	**2.2**	0.2	0.064 J
Phenol	**0.33**	100	NR	0.19 U	0.19 U	0.2 U	0.18 U	0.19 U
Pyrene	**64**	100	32 L	2 L	1.7 L	6.2 L	0.4 L	0.15 L

Table 3
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Soil Documentation Analytical Results
Semivolatile Organic Compounds

		AKRF Sample ID	EP-07_2_20231005	EP-08_2_20231013	EP-09_2-6_20231215	EP-10_2-6_20231215	SW-01_10_20231211	SW-02_10_20231211
		Laboratory Sample ID	L2359312-07	L2359312-08	L2374328-01	L2374328-02	L2373009-01	L2373009-02
		Date Sampled	10/05/2023	10/13/2023	12/15/2023	12/15/2023	12/11/2023	12/11/2023
		Dilution Factor	1	5	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	0.031 UJ	0.16 UJ	0.029 U	0.027 U	0.027 UJ	0.027 UJ
2,4,5-Trichlorophenol	NS	NS	0.2 U	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
2,4,6-Trichlorophenol	NS	NS	0.12 U	0.62 UJ	0.12 U	0.11 U	0.11 U	0.11 U
2,4-Dichlorophenol	NS	NS	0.18 U	0.94 UJ	0.18 U	0.16 U	0.16 U	0.16 U
2,4-Dimethylphenol	NS	NS	0.2 U	1 UJ	0.2 U	0.18 U	0.18 UJ	0.18 UJ
2,4-Dinitrophenol	NS	NS	0.98 U	5 UJ	0.94 UJ	0.86 UJ	0.88 UJ	0.87 UJ
2,4-Dinitrotoluene	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
2,6-Dinitrotoluene	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
2-Chloronaphthalene	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
2-Chlorophenol	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
2-Methylnaphthalene	NS	NS	0.051 J	3.3 L	0.059 J	0.21 U	0.22 U	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	0.2 U	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
2-Nitroaniline	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
2-Nitrophenol	NS	NS	0.44 U	2.2 UJ	0.42 U	0.39 U	0.39 U	0.39 U
3- And 4- Methylphenol (Total)	NS	NS	0.032 J	0.76 J	0.28 U	0.26 U	0.26 U	0.26 U
3,3'-Dichlorobenzidine	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
3-Nitroaniline	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
4,6-Dinitro-2-Methylphenol	NS	NS	0.53 U	2.7 UJ	0.51 U	0.46 U	0.47 UJ	0.47 UJ
4-Bromophenyl Phenyl Ether	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
4-Chloro-3-Methylphenol	NS	NS	0.2 U	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
4-Chloroaniline	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 UJ	0.18 UJ
4-Chlorophenyl Phenyl Ether	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
4-Nitroaniline	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
4-Nitrophenol	NS	NS	0.29 U	1.4 UJ	0.27 U	0.25 U	0.26 UJ	0.25 UJ
Acenaphthene	20	100	0.16 L	2 L	0.22	0.02 J	0.14 U	0.14 U
Acenaphthylene	100	100	0.1 J	0.37 J	0.12 J	0.14 U	0.14 U	0.14 U
Acetophenone	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Anthracene	100	100	0.52 L	2.7 L	0.61	0.11 U	0.11 U	0.11 U
Benzo(a)Anthracene	**1**	1.4	**1.3 L**	**4.5 L**	**1.6**	0.094 J	0.11 U	0.11 U
Benzo(a)Pyrene	**1**	1	**1.3 L**	**4.3 L**	**1.8**	0.1 J	0.14 U	0.14 U
Benzo(b)Fluoranthene	**1**	1.4	**1.5 L**	**4.8 L**	**2**	0.11	0.11 U	0.11 U
Benzo(g,h,i)Perylene	**0.64**	4.9	**0.7 L**	**2.2 L**	**0.95**	0.052 J	0.14 U	0.14 U
Benzo(k)Fluoranthene	**0.8**	4.9	0.49 L	**1.7 L**	0.59	0.034 J	0.11 U	0.11 U
Benzoic Acid	NS	NS	0.66 UJ	3.4 R	0.63 R	0.58 R	0.59 R	0.59 R
Benzyl Alcohol	NS	NS	0.2 U	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Benzyl Butyl Phthalate	NS	NS	0.2 UJ	1 UJ	0.055 J	0.18 U	0.18 U	0.18 U
Biphenyl (Diphenyl)	NS	NS	0.47 UJ	0.47 J	0.03 J	0.41 U	0.42 U	0.41 U
Bis(2-Chloroethoxy) Methane	NS	NS	0.22 UJ	1.1 UJ	0.21 U	0.19 U	0.2 U	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.18 UJ	0.94 U	0.18 U	0.16 U	0.16 U	0.16 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.24 UJ	1.2 UJ	0.23 UJ	0.21 UJ	0.22 UJ	0.22 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Carbazole	NS	NS	0.15 J	1.2 L	0.19 J	0.18 U	0.18 U	0.18 U
Chrysene	**1**	4.9	**1.2 L**	**4.8 L**	**1.6**	0.096 J	0.11 U	0.11 U
Dibenz(a,h)Anthracene	**0.33**	0.33	0.18 L	**0.58 J**	0.23	0.11 U	0.11 U	0.11 U
Dibenzofuran	**2.1**	18	0.12 J	1.6 L	0.16 J	0.18 U	0.18 U	0.18 U
Diethyl Phthalate	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Dimethyl Phthalate	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Di-N-Butyl Phthalate	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Di-N-Octylphthalate	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Fluoranthene	**85**	100	2.9 L	11 L	3.8	0.24	0.11 U	0.11 U
Fluorene	30	100	0.16 J	1.8 L	0.15 J	0.18 U	0.18 U	0.18 U
Hexachlorobenzene	0.33	0.33	0.12 UJ	0.62 UJ	0.12 U	0.11 U	0.11 U	0.11 U
Hexachlorobutadiene	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Hexachlorocyclopentadiene	NS	NS	0.59 UJ	3 UJ	0.56 U	0.51 U	0.52 UJ	0.52 UJ
Hexachloroethane	NS	NS	0.16 UJ	0.83 UJ	0.16 U	0.14 U	0.14 U	0.14 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	**0.88 L**	**2.5 L**	**0.99**	0.052 J	0.14 U	0.14 U
Isophorone	NS	NS	0.18 UJ	0.94 UJ	0.18 U	0.16 U	0.16 U	0.16 U
Naphthalene	12	100	0.086 J	2.8 L	0.13 J	0.18 U	0.18 U	0.18 U
Nitrobenzene	0.08	1.8	0.18 UJ	0.94 UJ	0.18 U	0.16 U	0.16 U	0.16 U
N-Nitrosodi-N-Propylamine	NS	NS	0.2 UJ	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
N-Nitrosodiphenylamine	NS	NS	0.16 UJ	0.83 U	0.16 U	0.14 U	0.14 U	0.14 U
Pentachlorophenol	0.8	1.3	0.16 U	0.83 UJ	0.16 U	0.14 U	0.14 U	0.14 U
Phenanthrene	**1.1**	4.9	**1.9 L**	**13 L**	**2.7**	0.16	0.11 U	0.11 U
Phenol	**0.33**	100	0.2 U	1 UJ	0.2 U	0.18 U	0.18 U	0.18 U
Pyrene	**64**	100	2.4 L	10 L	3.5	0.2	0.11 U	0.11 U

Table 3
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Soil Documentation Analytical Results

Semivolatile Organic Compounds

		AKRF Sample ID	SW-03_10_20231211	SW-04_10_20231211	SW-05_10_20231211	SW-06_17_20240117	SW-07_17_20240117	X-17_20240123
		Laboratory Sample ID	L2373009-03	L2373009-04	L2373009-05	L2402735-01	L2402735-02	L2403778-04
		Date Sampled	12/11/2023	12/11/2023	12/11/2023	1/17/2024	1/17/2024	1/23/2024
		Dilution Factor	1	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	0.028 UJ	0.028 UJ	0.027 UJ	0.034 UJ	0.028 UJ	0.031 U
2,4,5-Trichlorophenol	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
2,4,6-Trichlorophenol	NS	NS	0.11 U	0.11 U	0.11 U	0.13 U	0.11 U	0.12 U
2,4-Dichlorophenol	NS	NS	0.17 U	0.17 U	0.16 U	0.2 U	0.17 U	0.19 U
2,4-Dimethylphenol	NS	NS	0.19 UJ	0.19 UJ	0.18 UJ	0.22 UJ	0.19 UJ	0.21 U
2,4-Dinitrophenol	NS	NS	0.9 UJ	0.89 UJ	0.88 UJ	1.1 UJ	0.91 UJ	1 U
2,4-Dinitrotoluene	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
2,6-Dinitrotoluene	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
2-Chloronaphthalene	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
2-Chlorophenol	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
2-Methylnaphthalene	NS	NS	0.22 U	0.22 U	0.22 U	0.27 UJ	0.023 J	0.046 J
2-Methylphenol (O-Cresol)	0.33	100	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
2-Nitroaniline	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
2-Nitrophenol	NS	NS	0.4 U	0.4 U	0.39 U	0.48 U	0.41 U	0.45 U
3- And 4- Methylphenol (Total)	NS	NS	0.27 U	0.27 U	0.26 U	0.32 U	0.27 U	0.3 U
3,3'-Dichlorobenzidine	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
3-Nitroaniline	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
4,6-Dinitro-2-Methylphenol	NS	NS	0.48 UJ	0.48 UJ	0.47 UJ	0.58 U	0.49 U	0.54 U
4-Bromophenyl Phenyl Ether	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
4-Chloro-3-Methylphenol	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
4-Chloroaniline	NS	NS	0.19 UJ	0.19 UJ	0.18 UJ	0.22 UJ	0.19 UJ	0.21 UJ
4-Chlorophenyl Phenyl Ether	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
4-Nitroaniline	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
4-Nitrophenol	NS	NS	0.26 UJ	0.26 UJ	0.26 UJ	0.31 UJ	0.27 UJ	0.29 U
Acenaphthene	20	100	0.15 U	0.15 U	0.14 U	0.18 UJ	0.22 L	0.084 J
Acenaphthylene	100	100	0.15 U	0.15 U	0.14 U	0.18 UJ	0.15 UJ	0.17 U
Acetophenone	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
Anthracene	100	100	0.11 U	0.11 U	0.11 U	0.13 UJ	0.11 UJ	0.17 J
Benzo(a)Anthracene	**1**	1.4	0.11 U	0.057 J	0.11 U	0.13 UJ	0.11 UJ	0.21 J
Benzo(a)Pyrene	**1**	1	0.15 U	0.058 J	0.14 U	0.18 UJ	0.15 UJ	0.2 J
Benzo(b)Fluoranthene	**1**	1.4	0.11 U	0.071 J	0.11 U	0.13 UJ	0.11 UJ	0.24 J
Benzo(g,h,i)Perylene	**0.64**	4.9	0.15 U	0.034 J	0.14 U	0.18 UJ	0.15 UJ	0.089 J
Benzo(k)Fluoranthene	**0.8**	4.9	0.11 U	0.11 U	0.11 U	0.13 UJ	0.11 UJ	0.054 J
Benzoic Acid	NS	NS	0.6 R	0.6 R	0.59 R	0.72 UJ	0.62 UJ	0.67 U
Benzyl Alcohol	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
Benzyl Butyl Phthalate	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
Biphenyl (Diphenyl)	NS	NS	0.42 U	0.42 U	0.42 U	0.51 U	0.43 U	0.47 U
Bis(2-Chloroethoxy) Methane	NS	NS	0.2 U	0.2 U	0.2 U	0.24 UJ	0.2 UJ	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.17 U	0.17 U	0.16 U	0.2 UJ	0.17 UJ	0.19 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.22 UJ	0.22 UJ	0.22 UJ	0.27 UJ	0.23 UJ	0.25 U
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
Carbazole	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.073 J
Chrysene	**1**	4.9	0.11 U	0.052 J	0.11 U	0.13 UJ	0.11 UJ	0.18 J
Dibenz(a,h)Anthracene	**0.33**	0.33	0.11 U	0.11 U	0.11 U	0.13 UJ	0.11 UJ	0.028 J
Dibenzofuran	**2.1**	18	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.075 J
Diethyl Phthalate	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
Dimethyl Phthalate	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
Di-N-Butyl Phthalate	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
Di-N-Octylphthalate	NS	NS	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
Fluoranthene	**85**	100	0.11 U	0.11	0.03 J	0.13 UJ	0.11 UJ	0.53 J
Fluorene	30	100	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.12 J
Hexachlorobenzene	0.33	0.33	0.11 U	0.11 U	0.11 U	0.13 UJ	0.11 UJ	0.12 U
Hexachlorobutadiene	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
Hexachlorocyclopentadiene	NS	NS	0.53 UJ	0.53 UJ	0.52 UJ	0.64 UJ	0.54 UJ	0.59 U
Hexachloroethane	NS	NS	0.15 U	0.15 U	0.14 U	0.18 UJ	0.15 UJ	0.17 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	0.15 U	0.035 J	0.14 U	0.18 UJ	0.15 UJ	0.087 J
Isophorone	NS	NS	0.17 U	0.17 U	0.16 U	0.2 UJ	0.17 UJ	0.19 U
Naphthalene	12	100	0.19 U	0.19 U	0.18 U	0.22 UJ	0.027 J	0.064 J
Nitrobenzene	0.08	1.8	0.17 U	0.17 U	0.16 U	0.2 U	0.17 U	0.19 U
N-Nitrosodi-N-Propylamine	NS	NS	0.19 U	0.19 U	0.18 U	0.22 UJ	0.19 UJ	0.21 U
N-Nitrosodiphenylamine	NS	NS	0.15 U	0.15 U	0.14 U	0.18 U	0.15 U	0.17 U
Pentachlorophenol	0.8	1.3	0.15 U	0.15 U	0.14 U	0.18 U	0.15 U	0.17 U
Phenanthrene	**1.1**	4.9	0.11 U	0.078 J	0.11 U	0.13 UJ	0.11 UJ	0.6 J
Phenol	**0.33**	100	0.19 U	0.19 U	0.18 U	0.22 U	0.19 U	0.21 U
Pyrene	**64**	100	0.11 U	0.1 J	0.027 J	0.13 UJ	0.11 UJ	0.46 J

Table 3
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results
Semivolatile Organic Compounds

		AKRF Sample ID	SW-08_17_20240117	SW-09_17_20240123	SW-09_20_20240126	SW-10_15_20240126	SW-11_17_20240126	SW-12_17_20240126
		Laboratory Sample ID	L2402735-05	L2403778-03	L2404658-09	L2404658-01	L2404658-02	L2404658-03
		Date Sampled	1/17/2024	1/23/2024	1/26/2024	1/26/2024	1/26/2024	1/26/2024
		Dilution Factor	1	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	0.029 UJ	0.032 UJ	NR	0.029 UJ	0.028 UJ	0.03 UJ
2,4,5-Trichlorophenol	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
2,4,6-Trichlorophenol	NS	NS	0.12 U	0.13 U	NR	0.11 U	0.11 U	0.12 U
2,4-Dichlorophenol	NS	NS	0.18 U	0.19 U	NR	0.17 U	0.17 U	0.18 U
2,4-Dimethylphenol	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
2,4-Dinitrophenol	NS	NS	0.94 UJ	1 UJ	NR	0.92 U	0.91 U	0.94 U
2,4-Dinitrotoluene	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
2,6-Dinitrotoluene	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
2-Chloronaphthalene	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
2-Chlorophenol	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
2-Methylnaphthalene	NS	NS	0.056 J	0.19 J	NR	0.23 U	0.23 U	0.24 U
2-Methylphenol (O-Cresol)	0.33	100	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
2-Nitroaniline	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
2-Nitrophenol	NS	NS	0.42 U	0.46 U	NR	0.41 U	0.41 U	0.42 U
3- And 4- Methylphenol (Total)	NS	NS	0.28 U	0.047 J	NR	0.28 U	0.27 U	0.28 U
3,3'-Dichlorobenzidine	NS	NS	0.2 UJ	0.21 U	NR	0.19 UJ	0.19 U	0.2 U
3-Nitroaniline	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
4,6-Dinitro-2-Methylphenol	NS	NS	0.51 U	0.55 U	NR	0.5 U	0.49 U	0.51 U
4-Bromophenyl Phenyl Ether	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
4-Chloro-3-Methylphenol	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
4-Chloroaniline	NS	NS	0.2 UJ	0.21 UJ	NR	0.19 U	0.19 U	0.2 U
4-Chlorophenyl Phenyl Ether	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
4-Nitroaniline	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
4-Nitrophenol	NS	NS	0.27 UJ	0.3 UJ	NR	0.27 U	0.26 U	0.28 U
Acenaphthene	20	100	0.04 J	0.7	NR	0.15 U	0.15 U	0.16 U
Acenaphthylene	100	100	0.16 UJ	0.22	NR	0.15 U	0.15 U	0.16 U
Acetophenone	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
Anthracene	100	100	0.071 J	1.4 J	NR	0.11 U	0.11 U	0.12 U
Benzo(a)Anthracene	**1**	1.4	0.045 J	**2.1 R**	0.11 U	0.11 UJ	0.11 U	0.12 U
Benzo(a)Pyrene	**1**	1	0.05 J	**2.2 R**	0.14 U	0.15 UJ	0.15 U	0.16 U
Benzo(b)Fluoranthene	**1**	1.4	0.12 UJ	**2.2 R**	0.11 U	0.11 UJ	0.11 U	0.12 U
Benzo(g,h,i)Perylene	**0.64**	4.9	0.025 J	**0.91 J**	NR	0.15 UJ	0.15 U	0.16 U
Benzo(k)Fluoranthene	**0.8**	4.9	0.12 UJ	0.13 UJ	NR	0.11 UJ	0.11 U	0.12 U
Benzoic Acid	NS	NS	0.63 UJ	0.69 UJ	NR	0.62 UJ	0.61 UJ	0.64 UJ
Benzyl Alcohol	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
Benzyl Butyl Phthalate	NS	NS	0.2 U	0.21 U	NR	0.19 UJ	0.19 U	0.2 U
Biphenyl (Diphenyl)	NS	NS	0.45 U	0.042 J	NR	0.44 U	0.43 U	0.45 U
Bis(2-Chloroethoxy) Methane	NS	NS	0.21 UJ	0.23 U	NR	0.21 U	0.2 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.18 UJ	0.19 U	NR	0.17 U	0.17 U	0.18 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.23 UJ	0.26 UJ	NR	0.23 U	0.23 U	0.24 U
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.2 U	0.21 U	NR	0.19 UJ	0.19 U	0.2 U
Carbazole	NS	NS	0.2 UJ	0.41	NR	0.19 U	0.19 U	0.2 U
Chrysene	**1**	4.9	0.046 J	**1.9 R**	NR	0.11 UJ	0.11 U	0.12 U
Dibenz(a,h)Anthracene	**0.33**	0.33	0.12 UJ	0.28	NR	0.11 UJ	0.11 U	0.12 U
Dibenzofuran	**2.1**	18	0.2 UJ	0.33	NR	0.19 U	0.19 U	0.2 U
Diethyl Phthalate	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
Dimethyl Phthalate	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
Di-N-Butyl Phthalate	NS	NS	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
Di-N-Octylphthalate	NS	NS	0.2 U	0.21 U	NR	0.19 UJ	0.19 U	0.2 U
Fluoranthene	**85**	100	0.12 J	5.1 R	NR	0.11 UJ	0.11 U	0.12 U
Fluorene	30	100	0.023 J	0.94 J	NR	0.19 U	0.19 U	0.2 U
Hexachlorobenzene	0.33	0.33	0.12 UJ	0.13 U	NR	0.11 U	0.11 U	0.12 U
Hexachlorobutadiene	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
Hexachlorocyclopentadiene	NS	NS	0.56 UJ	0.61 UJ	NR	0.55 U	0.54 U	0.56 U
Hexachloroethane	NS	NS	0.16 UJ	0.17 U	NR	0.15 U	0.15 U	0.16 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	0.16 UJ	**0.88**	0.14 U	0.15 UJ	0.15 U	0.16 U
Isophorone	NS	NS	0.18 UJ	0.19 U	NR	0.17 U	0.17 U	0.18 U
Naphthalene	12	100	0.035 J	0.27	NR	0.19 U	0.19 U	0.2 U
Nitrobenzene	0.08	1.8	0.18 U	0.19 U	NR	0.17 U	0.17 U	0.18 U
N-Nitrosodi-N-Propylamine	NS	NS	0.2 UJ	0.21 U	NR	0.19 U	0.19 U	0.2 U
N-Nitrosodiphenylamine	NS	NS	0.16 U	0.17 U	NR	0.15 U	0.15 U	0.16 U
Pentachlorophenol	0.8	1.3	0.16 U	0.17 U	NR	0.15 U	0.15 U	0.16 U
Phenanthrene	**1.1**	4.9	0.099 J	**5.1 R**	NR	0.11 U	0.11 U	0.12 U
Phenol	**0.33**	100	0.2 U	0.21 U	NR	0.19 U	0.19 U	0.2 U
Pyrene	**64**	100	0.19 J	4.2 R	NR	0.11 UJ	0.11 U	0.12 U

Table 3
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results

Semivolatile Organic Compounds

		AKRF Sample ID	SW-13_15_20240126	SW-14_17_20240126	SW-15_17_20240126	SW-16_17_20240129	SW-17_17_20240131	UST-B_8_20231018
		Laboratory Sample ID	L2404658-04	L2404658-05	L2404658-06	L2404867-01	L2405262-02	L2359312-13
		Date Sampled	1/26/2024	1/26/2024	1/26/2024	1/29/2024	1/31/2024	10/18/2023
		Dilution Factor	1	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	0.032 UJ	0.029 UJ	0.029 UJ	0.028 UJ	0.028 UJ	0.03 U
2,4,5-Trichlorophenol	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2,4,6-Trichlorophenol	NS	NS	0.13 U	0.12 U	0.12 U	0.11 U	0.11 U	0.12 U
2,4-Dichlorophenol	NS	NS	0.19 U	0.17 U	0.18 U	0.17 U	0.17 U	0.18 U
2,4-Dimethylphenol	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2,4-Dinitrophenol	NS	NS	1 U	0.92 U	0.94 U	0.9 U	0.91 UJ	0.95 R
2,4-Dinitrotoluene	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2,6-Dinitrotoluene	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2-Chloronaphthalene	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2-Chlorophenol	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2-Methylnaphthalene	NS	NS	0.25 U	0.23 U	0.23 U	0.22 U	0.23 U	1.4 J
2-Methylphenol (O-Cresol)	0.33	100	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2-Nitroaniline	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
2-Nitrophenol	NS	NS	0.46 U	0.42 U	0.42 U	0.4 U	0.41 U	0.43 U
3- And 4- Methylphenol (Total)	NS	NS	0.3 U	0.28 U	0.28 U	0.27 U	0.27 U	0.072 J
3,3'-Dichlorobenzidine	NS	NS	0.21 UJ	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
3-Nitroaniline	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 UJ	0.2 U
4,6-Dinitro-2-Methylphenol	NS	NS	0.55 U	0.5 U	0.51 U	0.49 U	0.49 U	0.52 UJ
4-Bromophenyl Phenyl Ether	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
4-Chloro-3-Methylphenol	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
4-Chloroaniline	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 UJ	0.2 U
4-Chlorophenyl Phenyl Ether	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
4-Nitroaniline	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
4-Nitrophenol	NS	NS	0.3 U	0.27 U	0.27 U	0.26 U	0.26 U	0.28 U
Acenaphthene	20	100	0.17 U	0.15 U	0.16 U	0.15 U	0.15 U	3.8 J
Acenaphthylene	100	100	0.17 U	0.15 U	0.16 U	0.15 U	0.15 U	0.58 J
Acetophenone	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Anthracene	100	100	0.13 U	0.12 U	0.12 U	0.11 U	0.11 U	7.6 J
Benzo(a)Anthracene	**1**	1.4	0.13 UJ	0.12 U	0.12 U	0.11 U	0.11 U	NR
Benzo(a)Pyrene	**1**	1	0.17 UJ	0.15 U	0.16 U	0.15 U	0.15 U	NR
Benzo(b)Fluoranthene	**1**	1.4	0.13 UJ	0.12 U	0.12 U	0.11 U	0.11 U	NR
Benzo(g,h,i)Perylene	**0.64**	4.9	0.17 UJ	0.15 U	0.16 U	0.15 U	0.15 U	**6.3 J**
Benzo(k)Fluoranthene	**0.8**	4.9	0.13 UJ	0.12 U	0.12 U	0.11 U	0.11 U	**2.5 J**
Benzoic Acid	NS	NS	0.68 UJ	0.62 UJ	0.63 UJ	0.6 UJ	0.62 UJ	0.64 R
Benzyl Alcohol	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Benzyl Butyl Phthalate	NS	NS	0.21 UJ	0.19 U	0.2 U	0.19 U	0.19 U	0.2 UJ
Biphenyl (Diphenyl)	NS	NS	0.48 U	0.44 U	0.45 U	0.43 U	0.43 U	0.51 J
Bis(2-Chloroethoxy) Methane	NS	NS	0.23 U	0.21 U	0.21 U	0.2 U	0.2 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.19 U	0.17 U	0.18 U	0.17 U	0.17 U	0.18 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.25 U	0.23 U	0.23 U	0.22 UJ	0.23 U	0.24 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.21 UJ	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Carbazole	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	2.5 J
Chrysene	**1**	4.9	0.13 UJ	0.12 U	0.12 U	0.11 U	0.11 U	NR
Dibenz(a,h)Anthracene	**0.33**	0.33	0.13 UJ	0.12 U	0.12 U	0.11 U	0.11 U	**1.8 J**
Dibenzofuran	**2.1**	18	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	**3 J**
Diethyl Phthalate	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Dimethyl Phthalate	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Di-N-Butyl Phthalate	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Di-N-Octylphthalate	NS	NS	0.21 UJ	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Fluoranthene	**85**	100	0.13 UJ	0.12 U	0.12 U	0.11 U	0.11 U	NR
Fluorene	30	100	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	3.2 J
Hexachlorobenzene	0.33	0.33	0.13 U	0.12 U	0.12 U	0.11 U	0.11 U	0.12 U
Hexachlorobutadiene	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
Hexachlorocyclopentadiene	NS	NS	0.6 U	0.55 U	0.56 U	0.53 UJ	0.54 U	0.57 U
Hexachloroethane	NS	NS	0.17 U	0.15 U	0.16 U	0.15 U	0.15 U	0.16 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	0.17 UJ	0.15 U	0.16 U	0.15 U	0.15 U	**6 J**
Isophorone	NS	NS	0.19 U	0.17 U	0.18 U	0.17 U	0.17 U	0.18 U
Naphthalene	12	100	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	2.6 J
Nitrobenzene	0.08	1.8	0.19 U	0.17 U	0.18 U	0.17 U	0.17 U	0.18 U
N-Nitrosodi-N-Propylamine	NS	NS	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U
N-Nitrosodiphenylamine	NS	NS	0.17 U	0.15 U	0.16 U	0.15 U	0.15 U	0.16 U
Pentachlorophenol	0.8	1.3	0.17 U	0.15 U	0.16 U	0.15 U	0.15 U	0.16 UJ
Phenanthrene	**1.1**	4.9	0.13 U	0.12 U	0.12 U	0.11 U	0.11 U	NR
Phenol	**0.33**	100	0.21 U	0.19 U	0.2 U	0.19 U	0.19 U	0.047 J
Pyrene	**64**	100	0.13 UJ	0.12 U	0.12 U	0.11 U	0.11 U	NR

Table 3
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Semivolatile Organic Compounds

		AKRF Sample ID	UST-B_8_20231018	UST-X_20231018	UST-X_20231018	UST-EW_7_20231018	UST-NW_7_20231018	UST-SW_7_20231018
		Laboratory Sample ID	L2359312-13	L2359312-14	L2359312-14	L2359312-12	L2359312-09	L2359312-10
		Date Sampled	10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023
		Dilution Factor	10	5	25	1	5	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	NR	0.16 U	NR	0.031 U	0.16 UJ	0.03 U
2,4,5-Trichlorophenol	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 UJ
2,4,6-Trichlorophenol	NS	NS	NR	0.63 U	NR	0.12 U	0.63 U	0.12 UJ
2,4-Dichlorophenol	NS	NS	NR	0.94 U	NR	0.19 U	0.94 UJ	0.18 UJ
2,4-Dimethylphenol	NS	NS	NR	1 U	NR	0.21 U	1 UJ	0.2 UJ
2,4-Dinitrophenol	NS	NS	NR	5 R	NR	0.99 R	5 R	0.97 R
2,4-Dinitrotoluene	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
2,6-Dinitrotoluene	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
2-Chloronaphthalene	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
2-Chlorophenol	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 UJ
2-Methylnaphthalene	NS	NS	NR	4.3 J	NR	0.14 J	0.23 J	0.16 J
2-Methylphenol (O-Cresol)	0.33	100	NR	1 U	NR	0.21 U	1 U	0.2 UJ
2-Nitroaniline	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
2-Nitrophenol	NS	NS	NR	2.2 U	NR	0.45 U	2.3 UJ	0.44 UJ
3- And 4- Methylphenol (Total)	NS	NS	NR	0.58 J	NR	0.075 J	1.5 UJ	0.036 J
3,3'-Dichlorobenzidine	NS	NS	NR	1 U	NR	0.21 U	1 UJ	0.2 U
3-Nitroaniline	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
4,6-Dinitro-2-Methylphenol	NS	NS	NR	2.7 UJ	NR	0.54 UJ	2.7 R	0.52 UJ
4-Bromophenyl Phenyl Ether	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
4-Chloro-3-Methylphenol	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 UJ
4-Chloroaniline	NS	NS	NR	1 U	NR	0.21 U	1 UJ	0.2 U
4-Chlorophenyl Phenyl Ether	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
4-Nitroaniline	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
4-Nitrophenol	NS	NS	NR	1.5 U	NR	0.29 U	1.5 UJ	0.28 UJ
Acenaphthene	20	100	NR	6.4 J	NR	0.19 J	0.46 J	0.65 J
Acenaphthylene	100	100	NR	8.2 J	NR	0.084 J	0.25 J	0.11 J
Acetophenone	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
Anthracene	100	100	NR	22 J	NR	0.35 J	1.7 J	1.5 J
Benzo(a)Anthracene	**1**	1.4	**13 J**	**34 J**	NR	**1.2 J**	**7.5 J**	**3.7 J**
Benzo(a)Pyrene	**1**	1	**13 J**	**28 J**	NR	**1.2 J**	**8.3 J**	**3.8 J**
Benzo(b)Fluoranthene	**1**	1.4	**14 J**	**32 J**	NR	**1.4 J**	**9.3 J**	**4.2 J**
Benzo(g,h,i)Perylene	**0.64**	4.9	NR	**14 J**	NR	**0.68 J**	**4.9 J**	**2.4 J**
Benzo(k)Fluoranthene	**0.8**	4.9	NR	**11 J**	NR	0.41 J	**3 J**	**1.4 J**
Benzoic Acid	NS	NS	NR	3.4 R	NR	0.67 R	3.4 R	0.65 R
Benzyl Alcohol	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 UJ
Benzyl Butyl Phthalate	NS	NS	NR	0.41 J	NR	0.21 UJ	1 UJ	0.2 UJ
Biphenyl (Diphenyl)	NS	NS	NR	1.5 J	NR	0.039 J	2.4 UJ	0.065 J
Bis(2-Chloroethoxy) Methane	NS	NS	NR	1.1 U	NR	0.22 U	1.1 UJ	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	NR	0.94 U	NR	0.19 U	0.94 U	0.18 U
Bis(2-Chloroisopropyl) Ether	NS	NS	NR	1.2 UJ	NR	0.25 UJ	1.2 UJ	0.24 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
Carbazole	NS	NS	NR	5.7 J	NR	0.18 J	0.44 J	0.45 J
Chrysene	**1**	4.9	**13 J**	**30 J**	NR	**1.1 J**	**6.6 J**	**3.4 J**
Dibenz(a,h)Anthracene	**0.33**	0.33	NR	**4 J**	NR	0.16 J	**1.2 J**	**0.49 J**
Dibenzofuran	**2.1**	18	NR	**8.9 J**	NR	0.15 J	0.43 J	0.42 J
Diethyl Phthalate	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
Dimethyl Phthalate	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
Di-N-Butyl Phthalate	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
Di-N-Octylphthalate	NS	NS	NR	1 U	NR	0.21 U	1 R	0.2 U
Fluoranthene	**85**	100	36 J	NR	**93 J**	2.4 J	16 J	NR
Fluorene	30	100	NR	6.8 J	NR	0.14 J	0.38 J	0.5 J
Hexachlorobenzene	0.33	0.33	NR	0.63 U	NR	0.12 U	0.63 U	0.12 U
Hexachlorobutadiene	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
Hexachlorocyclopentadiene	NS	NS	NR	3 U	NR	0.59 U	3 R	0.58 U
Hexachloroethane	NS	NS	NR	0.84 U	NR	0.16 U	0.84 UJ	0.16 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	NR	**17 J**	NR	**0.61 J**	**5.2 J**	**2.1 J**
Isophorone	NS	NS	NR	0.94 U	NR	0.19 U	0.94 UJ	0.18 U
Naphthalene	12	100	NR	5.1 J	NR	0.48 J	0.99 J	0.45 J
Nitrobenzene	0.08	1.8	NR	0.94 U	NR	0.19 U	0.94 UJ	0.18 U
N-Nitrosodi-N-Propylamine	NS	NS	NR	1 U	NR	0.21 U	1 U	0.2 U
N-Nitrosodiphenylamine	NS	NS	NR	0.84 U	NR	0.16 U	0.84 U	0.16 U
Pentachlorophenol	0.8	1.3	NR	0.84 UJ	NR	0.16 UJ	0.84 UJ	0.16 UJ
Phenanthrene	**1.1**	4.9	**37 J**	NR	**95 J**	**1.8 J**	**7.4 J**	**6.6 J**
Phenol	**0.33**	100	NR	**0.4 J**	NR	0.062 J	1 UJ	0.2 UJ
Pyrene	**64**	100	31 J	NR	**73 J**	2.2 J	14 J	7.2 J

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Soil Documentation Analytical Results

Semivolatile Organic Compounds

		AKRF Sample ID	UST-SW_7_20231018	UST-WW_7_20231018
		Laboratory Sample ID	L2359312-10	L2359312-11
		Date Sampled	10/18/2023	10/18/2023
		Dilution Factor	5	1
		Unit	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	NR	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	5.7	NR	0.03 U
2,4,5-Trichlorophenol	NS	NS	NR	0.2 U
2,4,6-Trichlorophenol	NS	NS	NR	0.12 U
2,4-Dichlorophenol	NS	NS	NR	0.18 U
2,4-Dimethylphenol	NS	NS	NR	0.2 U
2,4-Dinitrophenol	NS	NS	NR	0.96 R
2,4-Dinitrotoluene	NS	NS	NR	0.2 U
2,6-Dinitrotoluene	NS	NS	NR	0.2 U
2-Chloronaphthalene	NS	NS	NR	0.2 U
2-Chlorophenol	NS	NS	NR	0.2 U
2-Methylnaphthalene	NS	NS	NR	0.12 J
2-Methylphenol (O-Cresol)	0.33	100	NR	0.2 U
2-Nitroaniline	NS	NS	NR	0.2 U
2-Nitrophenol	NS	NS	NR	0.43 U
3- And 4- Methylphenol (Total)	NS	NS	NR	0.29 UJ
3,3'-Dichlorobenzidine	NS	NS	NR	0.2 U
3-Nitroaniline	NS	NS	NR	0.2 U
4,6-Dinitro-2-Methylphenol	NS	NS	NR	0.52 UJ
4-Bromophenyl Phenyl Ether	NS	NS	NR	0.2 U
4-Chloro-3-Methylphenol	NS	NS	NR	0.2 U
4-Chloroaniline	NS	NS	NR	0.2 U
4-Chlorophenyl Phenyl Ether	NS	NS	NR	0.2 U
4-Nitroaniline	NS	NS	NR	0.2 U
4-Nitrophenol	NS	NS	NR	0.28 U
Acenaphthene	20	100	NR	0.22 J
Acenaphthylene	100	100	NR	0.26 J
Acetophenone	NS	NS	NR	0.2 U
Anthracene	100	100	NR	0.7 J
Benzo(a)Anthracene	**1**	1.4	NR	**1.9 J**
Benzo(a)Pyrene	**1**	1	NR	**1.8 J**
Benzo(b)Fluoranthene	**1**	1.4	NR	**2.1 J**
Benzo(g,h,i)Perylene	**0.64**	4.9	NR	**0.95 J**
Benzo(k)Fluoranthene	**0.8**	4.9	NR	0.61 J
Benzoic Acid	NS	NS	NR	0.64 R
Benzyl Alcohol	NS	NS	NR	0.2 U
Benzyl Butyl Phthalate	NS	NS	NR	0.2 UJ
Biphenyl (Diphenyl)	NS	NS	NR	0.06 J
Bis(2-Chloroethoxy) Methane	NS	NS	NR	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	NR	0.18 U
Bis(2-Chloroisopropyl) Ether	NS	NS	NR	0.24 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	NR	0.2 U
Carbazole	NS	NS	NR	0.25 J
Chrysene	**1**	4.9	NR	**1.7 J**
Dibenz(a,h)Anthracene	**0.33**	0.33	NR	0.26 J
Dibenzofuran	**2.1**	18	NR	0.22 J
Diethyl Phthalate	NS	NS	NR	0.2 U
Dimethyl Phthalate	NS	NS	NR	0.2 U
Di-N-Butyl Phthalate	NS	NS	NR	0.2 U
Di-N-Octylphthalate	NS	NS	NR	0.2 U
Fluoranthene	**85**	100	11 J	4.2 J
Fluorene	30	100	NR	0.24 J
Hexachlorobenzene	0.33	0.33	NR	0.12 U
Hexachlorobutadiene	NS	NS	NR	0.2 U
Hexachlorocyclopentadiene	NS	NS	NR	0.57 U
Hexachloroethane	NS	NS	NR	0.16 U
Indeno(1,2,3-c,d)Pyrene	**0.5**	1.4	NR	**0.88 J**
Isophorone	NS	NS	NR	0.18 U
Naphthalene	12	100	NR	0.26 J
Nitrobenzene	0.08	1.8	NR	0.18 U
N-Nitrosodi-N-Propylamine	NS	NS	NR	0.2 U
N-Nitrosodiphenylamine	NS	NS	NR	0.16 U
Pentachlorophenol	0.8	1.3	NR	0.16 UJ
Phenanthrene	**1.1**	4.9	NR	**3.3 J**
Phenol	**0.33**	100	NR	0.2 UJ
Pyrene	**64**	100	NR	3.6 J

Table 4
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Metals

		AKRF Sample ID	BS-01_15_20231212	BS-01_15_20231212	BS-02_15_20231212	BS-02_15_20231212	BS-03_15_20231212
		Laboratory Sample ID	L2373009-06	L2373009-06	L2373009-07	L2373009-07	L2373009-08
		Date Sampled	12/12/2023	12/12/2023	12/12/2023	12/12/2023	12/12/2023
		Dilution Factor	1	2	1	2	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	5,180 L	NR	2,420 L	NR
Antimony	NS	NS	NR	4.3 U	NR	4.48 U	NR
Arsenic	**13**	16	NR	3.03	NR	1.85	NR
Barium	410	410	NR	39.3	NR	15.3	NR
Beryllium	4.4	43	NR	0.472	NR	0.23 J	NR
Cadmium	**2.5**	2.5	NR	0.859 U	NR	0.897 U	NR
Calcium	NS	NS	NR	888	NR	720	NR
Chromium, Hexavalent	**1**	1	0.205 J	NR	0.277 J	NR	0.92 UJ
Chromium, Total	NS	NS	NR	13.8	NR	11.1	NR
Cobalt	NS	NS	NR	4.7	NR	3.89	NR
Copper	**50**	280	NR	16.3	NR	7.4	NR
Iron	NS	NS	NR	10,600	NR	12,400	NR
Lead	**63**	400	NR	16.7	NR	5.78	NR
Magnesium	NS	NS	NR	2,350	NR	1,060	NR
Manganese	1,600	2,000	NR	172	NR	59.4	NR
Mercury	**0.18**	0.26	0.072 U	NR	0.073 U	NR	0.073 U
Nickel	**30**	210	NR	17.9	NR	10.2	NR
Potassium	NS	NS	NR	1,060	NR	413	NR
Selenium	4	110	NR	0.536 J	NR	0.447 J	NR
Silver	2	110	NR	0.43 U	NR	0.448 U	NR
Sodium	NS	NS	NR	127 J	NR	70.2 J	NR
Thallium	NS	NS	NR	0.593 J	NR	1.79 U	NR
Vanadium	NS	NS	NR	19.3	NR	40.4	NR
Zinc	**109**	6,600	NR	33.6	NR	18	NR

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Metals

AKRF Sample ID			BS-03_15_20231212	BS-04_17_20240117	BS-04_17_20240117	BS-05_17_20240117	BS-05_17_20240117
Laboratory Sample ID			L2373009-08	L2402735-03	L2402735-03	L2402735-04	L2402735-04
Date Sampled			12/12/2023	1/17/2024	1/17/2024	1/17/2024	1/17/2024
Dilution Factor			2	1	2	1	2
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	4,510 L	NR	5,810 L	NR	7,600 L
Antimony	NS	NS	4.4 U	NR	4.79 U	NR	4.44 U
Arsenic	**13**	16	4.03	NR	2.59	NR	3.45
Barium	410	410	28.8	NR	27.7 J	NR	32.6 J
Beryllium	4.4	43	0.343 J	NR	0.479 U	NR	0.444 U
Cadmium	**2.5**	2.5	0.881 U	NR	0.958 U	NR	0.888 U
Calcium	NS	NS	1,080	NR	812	NR	1,100
Chromium, Hexavalent	**1**	1	NR	0.983 U	NR	0.934 U	NR
Chromium, Total	NS	NS	10.6	NR	12.6	NR	14.2
Cobalt	NS	NS	4.29	NR	3.31	NR	4.1
Copper	**50**	280	11.1	NR	12.2 J	NR	8.07 J
Iron	NS	NS	8,670	NR	10,200	NR	15,000
Lead	**63**	400	8.14	NR	29.6 J	NR	6.4 J
Magnesium	NS	NS	1,990	NR	2,210	NR	1,890
Manganese	1,600	2,000	146	NR	73	NR	227
Mercury	**0.18**	0.26	NR	0.069 J	NR	0.075 U	NR
Nickel	**30**	210	14.3	NR	15.9	NR	15.5
Potassium	NS	NS	769	NR	665	NR	485
Selenium	4	110	1.76 U	NR	1.92 U	NR	1.78 U
Silver	2	110	0.44 U	NR	0.479 U	NR	0.444 U
Sodium	NS	NS	102 J	NR	157 J	NR	94.6 J
Thallium	NS	NS	0.379 J	NR	1.92 U	NR	0.29 J
Vanadium	NS	NS	19.8	NR	17.6	NR	19.7
Zinc	**109**	6,600	25.6	NR	26.4	NR	22.8

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Metals

		AKRF Sample ID	BS-06_17_20240123	BS-06_17_20240123	BS-07_17_20240123	BS-07_17_20240123	BS-08_17_20240126
		Laboratory Sample ID	L2403778-01	L2403778-01	L2403778-02	L2403778-02	L2404658-07
		Date Sampled	1/23/2024	1/23/2024	1/23/2024	1/23/2024	1/26/2024
		Dilution Factor	1	2	1	2	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	4,030	NR	5,900	NR
Antimony	NS	NS	NR	4.46 U	NR	4.48 U	NR
Arsenic	**13**	16	NR	**15**	NR	1.84	NR
Barium	410	410	NR	21.5 J	NR	15 J	NR
Beryllium	4.4	43	NR	0.261 J	NR	0.264 J	NR
Cadmium	**2.5**	2.5	NR	0.891 U	NR	0.895 U	NR
Calcium	NS	NS	NR	633	NR	516	NR
Chromium, Hexavalent	**1**	1	0.92 U	NR	0.901 U	NR	0.959 UJ
Chromium, Total	NS	NS	NR	10.2	NR	11.8	NR
Cobalt	NS	NS	NR	3.54	NR	2.61	NR
Copper	**50**	280	NR	8.53 J	NR	7.16 J	NR
Iron	NS	NS	NR	8,160	NR	8,000	NR
Lead	**63**	400	NR	**204 J**	NR	42.2 J	NR
Magnesium	NS	NS	NR	1,570	NR	2,250	NR
Manganese	1,600	2,000	NR	74.7	NR	54.3	NR
Mercury	**0.18**	0.26	0.115	NR	0.089	NR	0.076 U
Nickel	**30**	210	NR	12.8	NR	15.2	NR
Potassium	NS	NS	NR	622	NR	403	NR
Selenium	4	110	NR	1.78 U	NR	1.79 U	NR
Silver	2	110	NR	0.446 U	NR	0.448 U	NR
Sodium	NS	NS	NR	144 J	NR	81.5 J	NR
Thallium	NS	NS	NR	1.78 U	NR	1.79 U	NR
Vanadium	NS	NS	NR	15	NR	15.5	NR
Zinc	**109**	6,600	NR	19.5	NR	18.2	NR

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		AKRF Sample ID	BS-08_17_20240126	BS-09_17_20240126	BS-09_17_20240126	BS-10_17_20240129	BS-10_17_20240129
		Laboratory Sample ID	L2404658-07	L2404658-08	L2404658-08	L2404867-02	L2404867-02
		Date Sampled	1/26/2024	1/26/2024	1/26/2024	1/29/2024	1/29/2024
		Dilution Factor	2	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	10,100 L	NR	8,270 L	NR	5,210 L
Antimony	NS	NS	4.59 UJ	NR	4.61 UJ	NR	4.57 U
Arsenic	**13**	16	4.52	NR	4.25	NR	2.06
Barium	410	410	21.9	NR	9.63	NR	28
Beryllium	4.4	43	0.33 J	NR	0.337 J	NR	0.457 U
Cadmium	**2.5**	2.5	0.919 U	NR	0.922 U	NR	0.913 U
Calcium	NS	NS	712	NR	762	NR	965
Chromium, Hexavalent	**1**	1	NR	0.946 UJ	NR	0.937 U	NR
Chromium, Total	NS	NS	18.9	NR	10.8	NR	11.4
Cobalt	NS	NS	3.44	NR	3.34	NR	4.48
Copper	**50**	280	7.15	NR	7.22	NR	12.6
Iron	NS	NS	17,200	NR	14,900	NR	10,000
Lead	**63**	400	8.84	NR	6.71	NR	8.33
Magnesium	NS	NS	1,920	NR	1,710	NR	2,230
Manganese	1,600	2,000	115	NR	97.2	NR	253
Mercury	**0.18**	0.26	NR	0.074 U	NR	0.074 U	NR
Nickel	**30**	210	9.63	NR	8.86	NR	15
Potassium	NS	NS	598	NR	448	NR	838
Selenium	4	110	0.346 J	NR	1.84 U	NR	1.83 U
Silver	2	110	0.459 U	NR	0.461 U	NR	0.457 U
Sodium	NS	NS	186	NR	85 J	NR	130 J
Thallium	NS	NS	0.363 J	NR	1.84 U	NR	1.83 U
Vanadium	NS	NS	26.4	NR	17.2	NR	16.8
Zinc	**109**	6,600	24.9	NR	21.4	NR	27.1

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AKRF Sample ID			BS-11_17_20240131	BS-11_17_20240131	EP-01_2_20231005	EP-01_2_20231005	EP-02_2_20231005
Laboratory Sample ID			L2405262-01	L2405262-01	L2359312-01	L2359312-01	L2359312-02
Date Sampled			1/31/2024	1/31/2024	10/05/2023	10/05/2023	10/05/2023
Dilution Factor			1	2	1	2	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	7,320 L	NR	5,910	NR
Antimony	NS	NS	NR	4.57 U	NR	4.54 U	NR
Arsenic	**13**	16	NR	3.94	NR	7.76	NR
Barium	410	410	NR	18.5	NR	248	NR
Beryllium	4.4	43	NR	0.411 J	NR	0.374 J	NR
Cadmium	**2.5**	2.5	NR	0.915 U	NR	0.416 J	NR
Calcium	NS	NS	NR	926	NR	5,720	NR
Chromium, Hexavalent	**1**	1	0.976 U	NR	0.933 U	NR	0.394 J
Chromium, Total	NS	NS	NR	10.2	NR	16.9	NR
Cobalt	NS	NS	NR	2.41	NR	5.26	NR
Copper	**50**	280	NR	3.64	NR	**87.7**	NR
Iron	NS	NS	NR	11,700	NR	13,600	NR
Lead	**63**	400	NR	5.21	NR	**880**	NR
Magnesium	NS	NS	NR	1,310	NR	2,070	NR
Manganese	1,600	2,000	NR	59.5	NR	223	NR
Mercury	**0.18**	0.26	0.082 U	NR	**2.49**	NR	**1.27**
Nickel	**30**	210	NR	7.5	NR	20.2	NR
Potassium	NS	NS	NR	413	NR	886	NR
Selenium	4	110	NR	1.83 U	NR	0.336 J	NR
Silver	2	110	NR	0.457 U	NR	0.521	NR
Sodium	NS	NS	NR	161 J	NR	136 J	NR
Thallium	NS	NS	NR	1.83 U	NR	0.736 J	NR
Vanadium	NS	NS	NR	15.2	NR	19.1	NR
Zinc	**109**	6,600	NR	15.4	NR	**324**	NR

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		AKRF Sample ID	EP-02_2_20231005	EP-03_2_20231005	EP-03_2_20231005	EP-04_2_20231005	EP-04_2_20231005
		Laboratory Sample ID	L2359312-02	L2359312-03	L2359312-03	L2359312-04	L2359312-04
		Date Sampled	10/05/2023	10/05/2023	10/05/2023	10/05/2023	10/05/2023
		Dilution Factor	2	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	8,080	NR	5,630	NR	6,130
Antimony	NS	NS	4.35 U	NR	4.44 U	NR	4.71 U
Arsenic	**13**	16	6.31	NR	7.69	NR	9.81
Barium	410	410	160	NR	185	NR	209
Beryllium	4.4	43	0.493	NR	0.376 J	NR	0.426 J
Cadmium	**2.5**	2.5	0.105 J	NR	0.196 J	NR	0.311 J
Calcium	NS	NS	4,700	NR	6,250	NR	8,300
Chromium, Hexavalent	**1**	1	NR	0.933 U	NR	0.98 U	NR
Chromium, Total	NS	NS	21.5	NR	17	NR	18.5
Cobalt	NS	NS	5.62	NR	5.84	NR	6.82
Copper	**50**	280	**61.2**	NR	**457**	NR	**466**
Iron	NS	NS	15,100	NR	13,900	NR	18,900
Lead	**63**	400	**1,740**	NR	**1,100**	NR	**749**
Magnesium	NS	NS	3,580	NR	2,290	NR	2,250
Manganese	1,600	2,000	273	NR	239	NR	247
Mercury	**0.18**	0.26	NR	**2.02**	NR	NR	NR
Nickel	**30**	210	26.8	NR	24.6	NR	20.4
Potassium	NS	NS	1,230	NR	887	NR	929
Selenium	4	110	0.26 J	NR	0.441 J	NR	0.262 J
Silver	2	110	0.524	NR	0.564	NR	0.857
Sodium	NS	NS	93.3 J	NR	131 J	NR	135 J
Thallium	NS	NS	0.917 J	NR	0.67 J	NR	0.632 J
Vanadium	NS	NS	22.9	NR	19.4	NR	20.6
Zinc	**109**	6,600	**144**	NR	**390**	NR	**446**

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		AKRF Sample ID	EP-04_2_20231005	EP-05_2_20231005	EP-05_2_20231005	EP-06_2_20231005	EP-06_2_20231005
		Laboratory Sample ID	L2359312-04	L2359312-05	L2359312-05	L2359312-06	L2359312-06
		Date Sampled	10/05/2023	10/05/2023	10/05/2023	10/05/2023	10/05/2023
		Dilution Factor	10	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	NR	5,320	NR	6,330
Antimony	NS	NS	NR	NR	4.38 U	NR	4.39 U
Arsenic	**13**	16	NR	NR	2.81	NR	**13.2**
Barium	410	410	NR	NR	30.6	NR	118
Beryllium	4.4	43	NR	NR	0.316 J	NR	0.371 J
Cadmium	**2.5**	2.5	NR	NR	0.876 U	NR	0.215 J
Calcium	NS	NS	NR	NR	1,290	NR	13,300
Chromium, Hexavalent	**1**	1	NR	0.899 U	NR	0.936 U	NR
Chromium, Total	NS	NS	NR	NR	17.7	NR	14.3
Cobalt	NS	NS	NR	NR	6.14	NR	5.73
Copper	**50**	280	NR	NR	21.6	NR	**149**
Iron	NS	NS	NR	NR	12,000	NR	14,100
Lead	**63**	400	NR	NR	22.9	NR	**332**
Magnesium	NS	NS	NR	NR	2,730	NR	2,430
Manganese	1,600	2,000	NR	NR	141	NR	213
Mercury	**0.18**	0.26	**5.05**	0.071 U	NR	**2.57**	NR
Nickel	**30**	210	NR	NR	**35.7**	NR	19.2
Potassium	NS	NS	NR	NR	1,110	NR	901
Selenium	4	110	NR	NR	1.75 U	NR	0.429 J
Silver	2	110	NR	NR	0.295 J	NR	1.19
Sodium	NS	NS	NR	NR	75.2 J	NR	156 J
Thallium	NS	NS	NR	NR	1.08 J	NR	0.575 J
Vanadium	NS	NS	NR	NR	22.4	NR	18.3
Zinc	**109**	6,600	NR	NR	50.4	NR	**262**

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		AKRF Sample ID	EP-07_2_20231005	EP-07_2_20231005	EP-08_2_20231013	EP-08_2_20231013	EP-09_2-6_20231215
		Laboratory Sample ID	L2359312-07	L2359312-07	L2359312-08	L2359312-08	L2374328-01
		Date Sampled	10/05/2023	10/05/2023	10/13/2023	10/13/2023	12/15/2023
		Dilution Factor	1	2	1	2	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	5,790	NR	6,320	NR
Antimony	NS	NS	NR	4.88 U	NR	2.57 J	NR
Arsenic	**13**	16	NR	12	NR	9.73	NR
Barium	410	410	NR	141	NR	290	NR
Beryllium	4.4	43	NR	0.375 J	NR	0.404 J	NR
Cadmium	**2.5**	2.5	NR	0.199 J	NR	**2.75**	NR
Calcium	NS	NS	NR	13,700	NR	12,900	NR
Chromium, Hexavalent	**1**	1	0.994 U	NR	**1.26**	NR	0.46 L
Chromium, Total	NS	NS	NR	13.8	NR	69.9	NR
Cobalt	NS	NS	NR	6.07	NR	7.3	NR
Copper	**50**	280	NR	**91.9**	NR	**122**	NR
Iron	NS	NS	NR	14,600	NR	13,600	NR
Lead	**63**	400	NR	**597**	NR	**849**	NR
Magnesium	NS	NS	NR	2,120	NR	2,480	NR
Manganese	1,600	2,000	NR	240	NR	207	NR
Mercury	**0.18**	0.26	**1.7**	NR	NR	**4.16**	**2.04**
Nickel	**30**	210	NR	19	NR	25	NR
Potassium	NS	NS	NR	935	NR	814	NR
Selenium	4	110	NR	0.52 J	NR	0.597 J	NR
Silver	2	110	NR	0.504	NR	0.655	NR
Sodium	NS	NS	NR	364	NR	160 J	NR
Thallium	NS	NS	NR	0.506 J	NR	0.688 J	NR
Vanadium	NS	NS	NR	19.9	NR	30.9	NR
Zinc	**109**	6,600	NR	**192**	NR	**702**	NR

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		AKRF Sample ID	EP-09_2-6_20231215	EP-09_2-6_20231215	EP-10_2-6_20231215	EP-10_2-6_20231215	SW-01_10_20231211
		Laboratory Sample ID	L2374328-01	L2374328-01	L2374328-02	L2374328-02	L2373009-01
		Date Sampled	12/15/2023	12/15/2023	12/15/2023	12/15/2023	12/11/2023
		Dilution Factor	2	20	1	2	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	5,460	NR	NR	4,130	NR
Antimony	NS	NS	8.02 H	NR	NR	4.2 U	NR
Arsenic	**13**	16	**15.6**	NR	NR	2.39	NR
Barium	410	410	112	NR	NR	25.8	NR
Beryllium	4.4	43	0.562	NR	NR	0.461 H	NR
Cadmium	**2.5**	2.5	1.3	NR	NR	0.194 J	NR
Calcium	NS	NS	11,300	NR	NR	1,090	NR
Chromium, Hexavalent	**1**	1	NR	NR	0.873 UJ	NR	0.537 J
Chromium, Total	NS	NS	22.8	NR	NR	10.5	NR
Cobalt	NS	NS	10.1	NR	NR	5.18	NR
Copper	**50**	280	**158**	NR	NR	19.4	NR
Iron	NS	NS	NR	64,700	NR	8,640	NR
Lead	**63**	400	**1,810**	NR	NR	60.5	NR
Magnesium	NS	NS	2,110	NR	NR	1,870	NR
Manganese	1,600	2,000	340	NR	NR	173	NR
Mercury	**0.18**	0.26	NR	NR	**0.299**	NR	0.055 J
Nickel	**30**	210	25.1	NR	NR	**33.2**	NR
Potassium	NS	NS	848	NR	NR	739	NR
Selenium	4	110	1.88 U	NR	NR	1.68 U	NR
Silver	2	110	0.456 J	NR	NR	0.42 U	NR
Sodium	NS	NS	179 J	NR	NR	79.5 J	NR
Thallium	NS	NS	0.349 J	NR	NR	1.68 U	NR
Vanadium	NS	NS	21.6	NR	NR	14.5	NR
Zinc	**109**	6,600	**268**	NR	NR	33	NR

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		AKRF Sample ID	SW-01_10_20231211	SW-02_10_20231211	SW-02_10_20231211	SW-03_10_20231211	SW-03_10_20231211
		Laboratory Sample ID	L2373009-01	L2373009-02	L2373009-02	L2373009-03	L2373009-03
		Date Sampled	12/11/2023	12/11/2023	12/11/2023	12/11/2023	12/11/2023
		Dilution Factor	2	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	3,430	NR	7,520	NR	4,500
Antimony	NS	NS	4.12 U	NR	4.2 U	NR	4.41 U
Arsenic	**13**	16	2.18	NR	3.38	NR	3.01
Barium	410	410	26.6	NR	37.3	NR	30
Beryllium	4.4	43	0.07 J	NR	0.04 J	NR	0.092 J
Cadmium	**2.5**	2.5	0.824 U	NR	0.839 U	NR	0.881 U
Calcium	NS	NS	956	NR	1,840	NR	928
Chromium, Hexavalent	**1**	1	NR	0.201 J	NR	0.899 UJ	NR
Chromium, Total	NS	NS	8.36	NR	17.5	NR	10.5
Cobalt	NS	NS	3.37	NR	4.4	NR	4.04
Copper	**50**	280	8.62	NR	12.6	NR	10.3
Iron	NS	NS	7,940	NR	13,500	NR	10,900
Lead	**63**	400	14.8	NR	8.76	NR	6.25
Magnesium	NS	NS	1,360	NR	3,480	NR	1,910
Manganese	1,600	2,000	208	NR	210	NR	270
Mercury	**0.18**	0.26	NR	0.07 U	NR	0.071 U	NR
Nickel	**30**	210	7.54	NR	11.7	NR	10.2
Potassium	NS	NS	702	NR	2,460	NR	1,070
Selenium	4	110	1.65 U	NR	1.68 U	NR	1.76 U
Silver	2	110	0.412 U	NR	0.42 U	NR	0.441 U
Sodium	NS	NS	107 J	NR	158 J	NR	123 J
Thallium	NS	NS	1.65 U	NR	0.384 J	NR	1.76 U
Vanadium	NS	NS	14	NR	27.5	NR	19.6
Zinc	**109**	6,600	19	NR	36	NR	21.5

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Metals

AKRF Sample ID			SW-04_10_20231211	SW-04_10_20231211	SW-05_10_20231211	SW-05_10_20231211	SW-06_17_20240117
Laboratory Sample ID			L2373009-04	L2373009-04	L2373009-05	L2373009-05	L2402735-01
Date Sampled			12/11/2023	12/11/2023	12/11/2023	12/11/2023	1/17/2024
Dilution Factor			1	2	1	2	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	5,730	NR	4,640	NR
Antimony	NS	NS	NR	4.36 U	NR	4.23 U	NR
Arsenic	**13**	16	NR	2.79	NR	2.49	NR
Barium	410	410	NR	36.1	NR	29.6	NR
Beryllium	4.4	43	NR	0.117 J	NR	0.073 J	NR
Cadmium	**2.5**	2.5	NR	0.872 U	NR	0.847 U	NR
Calcium	NS	NS	NR	1,320	NR	1,010	NR
Chromium, Hexavalent	**1**	1	0.914 UJ	NR	0.877 UJ	NR	1 J
Chromium, Total	NS	NS	NR	12.1	NR	10.2	NR
Cobalt	NS	NS	NR	4.38	NR	4.26	NR
Copper	**50**	280	NR	11	NR	9.67	NR
Iron	NS	NS	NR	11,700	NR	10,400	NR
Lead	**63**	400	NR	7.85	NR	7.97	NR
Magnesium	NS	NS	NR	2,560	NR	2,050	NR
Manganese	1,600	2,000	NR	243	NR	187	NR
Mercury	**0.18**	0.26	**0.439**	NR	0.07 U	NR	0.085 U
Nickel	**30**	210	NR	13.9	NR	9.86	NR
Potassium	NS	NS	NR	1,140	NR	983	NR
Selenium	4	110	NR	1.74 U	NR	1.69 U	NR
Silver	2	110	NR	0.436 U	NR	0.423 U	NR
Sodium	NS	NS	NR	120 J	NR	116 J	NR
Thallium	NS	NS	NR	1.74 U	NR	1.69 U	NR
Vanadium	NS	NS	NR	17.6	NR	16.7	NR
Zinc	**109**	6,600	NR	28.4	NR	21.9	NR

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Metals

		AKRF Sample ID	SW-06_17_20240117	SW-07_17_20240117	SW-07_17_20240117	X-17_20240123	X-17_20240123
		Laboratory Sample ID	L2402735-01	L2402735-02	L2402735-02	L2403778-04	L2403778-04
		Date Sampled	1/17/2024	1/17/2024	1/17/2024	1/23/2024	1/23/2024
		Dilution Factor	2	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	9,250 L	NR	6,430 L	NR	7,510
Antimony	NS	NS	5.18 U	NR	4.52 U	NR	0.553 J
Arsenic	**13**	16	2.65	NR	2.21	NR	4.25
Barium	410	410	10.8 J	NR	13 J	NR	37.3 J
Beryllium	4.4	43	0.518 U	NR	0.452 U	NR	0.453 J
Cadmium	**2.5**	2.5	1.04 U	NR	0.904 U	NR	0.992 U
Calcium	NS	NS	656	NR	1,380	NR	1,520
Chromium, Hexavalent	**1**	1	NR	0.564 J	NR	1.01 U	NR
Chromium, Total	NS	NS	14.6	NR	10.8	NR	13.4
Cobalt	NS	NS	3.65	NR	3.2	NR	4.24
Copper	**50**	280	4.84 J	NR	5.66 J	NR	12.1 J
Iron	NS	NS	12,400	NR	10,100	NR	10,200
Lead	**63**	400	6.11 J	NR	7.9 J	NR	43.8 J
Magnesium	NS	NS	1,730	NR	1,470	NR	1,790
Manganese	1,600	2,000	76.6	NR	74.2	NR	83
Mercury	**0.18**	0.26	NR	0.073 U	NR	0.068 J	NR
Nickel	**30**	210	11.1	NR	8.55	NR	13
Potassium	NS	NS	422	NR	387	NR	470
Selenium	4	110	2.07 U	NR	1.81 U	NR	0.397 J
Silver	2	110	0.518 U	NR	0.452 U	NR	0.496 U
Sodium	NS	NS	146 J	NR	126 J	NR	175 J
Thallium	NS	NS	2.07 U	NR	1.81 U	NR	1.98 U
Vanadium	NS	NS	17.3	NR	14.1	NR	17.8
Zinc	**109**	6,600	20.7	NR	19.5	NR	27.2

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Metals

		AKRF Sample ID	SW-08_17_20240117	SW-08_17_20240117	SW-09_17_20240123	SW-09_17_20240123	SW-10_15_20240126
		Laboratory Sample ID	L2402735-05	L2402735-05	L2403778-03	L2403778-03	L2404658-01
		Date Sampled	1/17/2024	1/17/2024	1/23/2024	1/23/2024	1/26/2024
		Dilution Factor	1	2	1	2	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	8,420 L	NR	8,290	NR
Antimony	NS	NS	NR	4.54 U	NR	5.05 U	NR
Arsenic	**13**	16	NR	5.89	NR	5.02	NR
Barium	410	410	NR	9.44 J	NR	43.6 J	NR
Beryllium	4.4	43	NR	0.454 U	NR	0.476 J	NR
Cadmium	**2.5**	2.5	NR	0.908 U	NR	1.01 U	NR
Calcium	NS	NS	NR	675	NR	1,640	NR
Chromium, Hexavalent	**1**	1	0.201 J	NR	1.04 U	NR	0.946 UJ
Chromium, Total	NS	NS	NR	15.2	NR	12.8 H	NR
Cobalt	NS	NS	NR	3.33	NR	3.83	NR
Copper	**50**	280	NR	7.55 J	NR	11 J	NR
Iron	NS	NS	NR	16,700	NR	11,400	NR
Lead	**63**	400	NR	6.82 J	NR	39.4 J	NR
Magnesium	NS	NS	NR	1,770	NR	1,780 H	NR
Manganese	1,600	2,000	NR	72.2	NR	91.2	NR
Mercury	**0.18**	0.26	0.074 U	NR	0.143	NR	0.075 U
Nickel	**30**	210	NR	10	NR	12.2	NR
Potassium	NS	NS	NR	513	NR	506	NR
Selenium	4	110	NR	1.82 U	NR	0.261 J	NR
Silver	2	110	NR	0.454 U	NR	0.505 U	NR
Sodium	NS	NS	NR	118 J	NR	182 J	NR
Thallium	NS	NS	NR	1.82 U	NR	0.344 J	NR
Vanadium	NS	NS	NR	22.1	NR	22.2	NR
Zinc	**109**	6,600	NR	20.4	NR	28.6 H	NR

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		AKRF Sample ID	SW-10_15_20240126	SW-11_17_20240126	SW-11_17_20240126	SW-12_17_20240126	SW-12_17_20240126
		Laboratory Sample ID	L2404658-01	L2404658-02	L2404658-02	L2404658-03	L2404658-03
		Date Sampled	1/26/2024	1/26/2024	1/26/2024	1/26/2024	1/26/2024
		Dilution Factor	2	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	6,630 L	NR	8,540 L	NR	10,500 L
Antimony	NS	NS	4.57 UJ	NR	4.48 UJ	NR	4.57 UJ
Arsenic	**13**	16	3.06	NR	2.74	NR	3.64
Barium	410	410	31.1	NR	32.4	NR	35.4
Beryllium	4.4	43	0.251 J	NR	0.417 J	NR	0.253 J
Cadmium	**2.5**	2.5	0.915 U	NR	0.896 U	NR	0.914 U
Calcium	NS	NS	562	NR	869	NR	847
Chromium, Hexavalent	**1**	1	NR	0.93 UJ	NR	0.966 UJ	NR
Chromium, Total	NS	NS	10.6	NR	12.4	NR	15.7
Cobalt	NS	NS	2.54	NR	3.14	NR	3.7
Copper	**50**	280	4.75	NR	4.57	NR	8.15
Iron	NS	NS	10,800	NR	11,900	NR	14,700
Lead	**63**	400	5.57	NR	7.39	NR	10.6
Magnesium	NS	NS	1,530	NR	1,480	NR	1,780
Manganese	1,600	2,000	68.1	NR	113	NR	133
Mercury	**0.18**	0.26	NR	0.073 U	NR	0.077 U	NR
Nickel	**30**	210	6.98	NR	8.89	NR	9.62
Potassium	NS	NS	401	NR	369	NR	561
Selenium	4	110	1.83 U	NR	0.388 J	NR	0.243 J
Silver	2	110	0.457 U	NR	0.448 U	NR	0.457 U
Sodium	NS	NS	146 J	NR	150 J	NR	145 J
Thallium	NS	NS	1.83 U	NR	1.79 U	NR	0.33 J
Vanadium	NS	NS	14.4	NR	15	NR	21.8
Zinc	**109**	6,600	17.4	NR	19.8	NR	23.6

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		AKRF Sample ID	SW-13_15_20240126	SW-13_15_20240126	SW-14_17_20240126	SW-14_17_20240126	SW-15_17_20240126
		Laboratory Sample ID	L2404658-04	L2404658-04	L2404658-05	L2404658-05	L2404658-06
		Date Sampled	1/26/2024	1/26/2024	1/26/2024	1/26/2024	1/26/2024
		Dilution Factor	1	2	1	2	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	10,100 L	NR	11,100 L	NR
Antimony	NS	NS	NR	4.9 UJ	NR	0.416 J	NR
Arsenic	**13**	16	NR	3.68	NR	7.56	NR
Barium	410	410	NR	41.6	NR	14.6	NR
Beryllium	4.4	43	NR	0.496	NR	0.365 J	NR
Cadmium	**2.5**	2.5	NR	0.98 U	NR	0.924 U	NR
Calcium	NS	NS	NR	1,230	NR	1,150	NR
Chromium, Hexavalent	**1**	1	1.02 UJ	NR	0.284 J	NR	0.959 UJ
Chromium, Total	NS	NS	NR	12.8	NR	20.4	NR
Cobalt	NS	NS	NR	2.78	NR	3.38	NR
Copper	**50**	280	NR	4.5	NR	7.4	NR
Iron	NS	NS	NR	14,000	NR	21,700	NR
Lead	**63**	400	NR	7.49	NR	9.35	NR
Magnesium	NS	NS	NR	1,340	NR	1,810	NR
Manganese	1,600	2,000	NR	76.2	NR	115	NR
Mercury	**0.18**	0.26	0.082 U	NR	0.074 U	NR	0.075 U
Nickel	**30**	210	NR	8.18	NR	9.11	NR
Potassium	NS	NS	NR	457	NR	636	NR
Selenium	4	110	NR	0.34 J	NR	0.545 J	NR
Silver	2	110	NR	0.49 U	NR	0.462 U	NR
Sodium	NS	NS	NR	190 J	NR	136 J	NR
Thallium	NS	NS	NR	1.96 U	NR	0.297 J	NR
Vanadium	NS	NS	NR	18.2	NR	30.7	NR
Zinc	**109**	6,600	NR	18.6	NR	26.2	NR

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		AKRF Sample ID	SW-15_17_20240126	SW-16_17_20240129	SW-16_17_20240129	SW-17_17_20240131	SW-17_17_20240131
		Laboratory Sample ID	L2404658-06	L2404867-01	L2404867-01	L2405262-02	L2405262-02
		Date Sampled	1/26/2024	1/29/2024	1/29/2024	1/31/2024	1/31/2024
		Dilution Factor	2	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	6,170 L	NR	6,840 L	NR	8,890 L
Antimony	NS	NS	0.431 J	NR	4.41 U	NR	4.59 U
Arsenic	**13**	16	2.98	NR	2.69	NR	6.46
Barium	410	410	9.53	NR	40.2	NR	8.29
Beryllium	4.4	43	0.25 J	NR	0.441 U	NR	0.311 J
Cadmium	**2.5**	2.5	0.915 U	NR	0.883 U	NR	0.918 U
Calcium	NS	NS	1,180	NR	1,130	NR	288
Chromium, Hexavalent	**1**	1	NR	0.92 U	NR	0.939 U	NR
Chromium, Total	NS	NS	10.2	NR	16.1	NR	15.2
Cobalt	NS	NS	3.05	NR	6.51	NR	3.5
Copper	**50**	280	6.24	NR	14.6	NR	7.27
Iron	NS	NS	16,600	NR	13,200	NR	14,700
Lead	**63**	400	6.3	NR	11.3	NR	7.32
Magnesium	NS	NS	1,560	NR	3,280	NR	1,870
Manganese	1,600	2,000	202	NR	164	NR	60.5
Mercury	**0.18**	0.26	NR	0.072 U	NR	0.08 U	NR
Nickel	**30**	210	8.13	NR	17.8	NR	9.72
Potassium	NS	NS	342	NR	1,480	NR	469
Selenium	4	110	0.356 J	NR	1.76 U	NR	0.238 J
Silver	2	110	0.458 U	NR	0.441 U	NR	0.459 U
Sodium	NS	NS	72.4 J	NR	260	NR	122 J
Thallium	NS	NS	0.314 J	NR	1.76 U	NR	1.84 U
Vanadium	NS	NS	13.8	NR	22.7	NR	21.9
Zinc	**109**	6,600	19.8	NR	36.3	NR	21

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AKRF Sample ID			UST-B_8_20231018	UST-B_8_20231018	UST-X_20231018	UST-X_20231018	UST-X_20231018
Laboratory Sample ID			L2359312-13	L2359312-13	L2359312-14	L2359312-14	L2359312-14
Date Sampled			10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023
Dilution Factor			1	2	1	2	10
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	5,250	NR	4,110	NR
Antimony	NS	NS	NR	0.61 J	NR	0.833 J	NR
Arsenic	**13**	16	NR	8.68	NR	9.62	NR
Barium	410	410	NR	125	NR	137	NR
Beryllium	4.4	43	NR	0.357 J	NR	0.294 J	NR
Cadmium	**2.5**	2.5	NR	0.201 J	NR	0.223 J	NR
Calcium	NS	NS	NR	16,100	NR	11,600	NR
Chromium, Hexavalent	**1**	1	0.268 J	NR	0.484 J	NR	NR
Chromium, Total	NS	NS	NR	14.7	NR	10.7	NR
Cobalt	NS	NS	NR	5.6	NR	6.23	NR
Copper	**50**	280	NR	**87.6**	NR	**91.3**	NR
Iron	NS	NS	NR	13,500	NR	13,800	NR
Lead	**63**	400	NR	**1,350**	NR	**826**	NR
Magnesium	NS	NS	NR	4,010 J	NR	1,520 J	NR
Manganese	1,600	2,000	NR	270	NR	212	NR
Mercury	**0.18**	0.26	NR	**3.46 J**	NR	NR	**13.6 J**
Nickel	**30**	210	NR	21.1	NR	15.6	NR
Potassium	NS	NS	NR	965	NR	690	NR
Selenium	4	110	NR	0.547 J	NR	0.492 J	NR
Silver	2	110	NR	0.537	NR	0.5	NR
Sodium	NS	NS	NR	350 J	NR	157 J	NR
Thallium	NS	NS	NR	0.606 J	NR	0.49 J	NR
Vanadium	NS	NS	NR	18.7	NR	16.5	NR
Zinc	**109**	6,600	NR	**268**	NR	**197**	NR

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AKRF Sample ID			UST-EW_7_20231018	UST-EW_7_20231018	UST-EW_7_20231018	UST-NW_7_20231018	UST-NW_7_20231018
Laboratory Sample ID			L2359312-12	L2359312-12	L2359312-12	L2359312-09	L2359312-09
Date Sampled			10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023
Dilution Factor			1	2	10	1	2
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	5,010	NR	NR	5,010
Antimony	NS	NS	NR	1.53 J	NR	NR	0.976 J
Arsenic	**13**	16	NR	9.75	NR	NR	12.7
Barium	410	410	NR	192	NR	NR	238
Beryllium	4.4	43	NR	0.363 J	NR	NR	0.341 J
Cadmium	**2.5**	2.5	NR	0.261 J	NR	NR	0.333 J
Calcium	NS	NS	NR	7,700	NR	NR	12,000
Chromium, Hexavalent	**1**	1	0.712 J	NR	NR	0.656 J	NR
Chromium, Total	NS	NS	NR	14.1	NR	NR	13.3
Cobalt	NS	NS	NR	6.35	NR	NR	5.9
Copper	**50**	280	NR	**81**	NR	NR	**91.7 L**
Iron	NS	NS	NR	13,500	NR	NR	17,000
Lead	**63**	400	NR	**1,650**	NR	NR	**910**
Magnesium	NS	NS	NR	1,530 J	NR	NR	1,700 J
Manganese	1,600	2,000	NR	245	NR	NR	234
Mercury	**0.18**	0.26	NR	NR	**24 J**	NR	NR
Nickel	**30**	210	NR	18.8	NR	NR	18.3
Potassium	NS	NS	NR	873	NR	NR	904
Selenium	4	110	NR	0.333 J	NR	NR	0.465 J
Silver	2	110	NR	0.403 J	NR	NR	0.628
Sodium	NS	NS	NR	176 J	NR	NR	214 J
Thallium	NS	NS	NR	0.735 J	NR	NR	0.557 J
Vanadium	NS	NS	NR	17.8	NR	NR	17.2
Zinc	**109**	6,600	NR	**262**	NR	NR	**282**

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Metals

		AKRF Sample ID	UST-NW_7_20231018	UST-SW_7_20231018	UST-SW_7_20231018	UST-WW_7_20231018	UST-WW_7_20231018
		Laboratory Sample ID	L2359312-09	L2359312-10	L2359312-10	L2359312-11	L2359312-11
		Date Sampled	10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023
		Dilution Factor	5	1	2	1	2
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NS	NR	NR	5,510	NR	5,170
Antimony	NS	NS	NR	NR	1.11 J	NR	2.71 J
Arsenic	**13**	16	NR	NR	11	NR	10.9
Barium	410	410	NR	NR	142	NR	143
Beryllium	4.4	43	NR	NR	0.335 J	NR	0.367 J
Cadmium	**2.5**	2.5	NR	NR	0.402 J	NR	0.438 J
Calcium	NS	NS	NR	NR	17,800	NR	8,740
Chromium, Hexavalent	**1**	1	NR	0.28 J	NR	0.28 J	NR
Chromium, Total	NS	NS	NR	NR	14.3	NR	15.3
Cobalt	NS	NS	NR	NR	5.47	NR	6.86
Copper	**50**	280	NR	NR	**65.9**	NR	**88.7**
Iron	NS	NS	NR	NR	14,600	NR	19,900
Lead	**63**	400	NR	NR	**1,000**	NR	**939**
Magnesium	NS	NS	NR	NR	1,930 J	NR	1,850 J
Manganese	1,600	2,000	NR	NR	250	NR	274
Mercury	**0.18**	0.26	**5.07 J**	NR	**4.08 J**	**1.8 J**	NR
Nickel	**30**	210	NR	NR	17.1	NR	19.5
Potassium	NS	NS	NR	NR	841	NR	926
Selenium	4	110	NR	NR	0.504 J	NR	0.558 J
Silver	2	110	NR	NR	0.541	NR	0.7
Sodium	NS	NS	NR	NR	192 J	NR	155 J
Thallium	NS	NS	NR	NR	0.569 J	NR	0.573 J
Vanadium	NS	NS	NR	NR	18.4	NR	18.2
Zinc	**109**	6,600	NR	NR	**228**	NR	**319**

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Polychlorinated Biphenyls (PCBs)

		AKRF Sample ID	BS-01_15_20231212	BS-02_15_20231212	BS-03_15_20231212	BS-04_17_20240117	BS-05_17_20240117
		Laboratory Sample ID	L2373009-06	L2373009-07	L2373009-08	L2402735-03	L2402735-04
		Date Sampled	12/12/2023	12/12/2023	12/12/2023	1/17/2024	1/17/2024
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0531 U	0.0531 U	0.0554 U	0.0594 U	0.0542 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0531 U	0.0531 U	0.0554 U	0.0594 U	0.0542 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0531 U	0.0531 U	0.0554 U	0.0594 UJ	0.0542 UJ
PCB-1242 (Aroclor 1242)	NS	NS	0.438	0.0612	0.0858	0.0594 U	0.0542 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0531 U	0.0531 U	0.0554 U	0.0594 U	0.0542 U
PCB-1254 (Aroclor 1254)	NS	NS	0.0591	0.00893 J	0.0116 J	0.0594 U	0.0542 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0225 J	0.0531 UJ	0.0554 UJ	0.0594 U	0.0542 U
PCB-1262 (Aroclor 1262)	NS	NS	0.0531 U	0.0531 U	0.0554 U	0.0594 U	0.0542 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0531 U	0.0531 U	0.0554 U	0.0594 U	0.0542 U
Total PCBs	**0.1**	1	**0.52 J**	0.0701 J	0.0974 J	0.0594 UJ	0.0542 UJ

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Polychlorinated Biphenyls (PCBs)

AKRF Sample ID			BS-06_17_20240123	BS-07_17_20240123	BS-08_17_20240126	BS-09_17_20240126	BS-10_17_20240129
Laboratory Sample ID			L2403778-01	L2403778-02	L2404658-07	L2404658-08	L2404867-02
Date Sampled			1/23/2024	1/23/2024	1/26/2024	1/26/2024	1/29/2024
Dilution Factor			1	1	1	1	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0546 UJ	0.0534 U	0.0554 U	0.056 U	0.0564 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0546 UJ	0.0534 U	0.0554 U	0.056 U	0.0564 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0546 UJ	0.0534 UJ	0.0554 U	0.056 U	0.0564 U
PCB-1242 (Aroclor 1242)	NS	NS	0.0546 UJ	0.0534 U	0.0554 U	0.056 U	0.0844
PCB-1248 (Aroclor 1248)	NS	NS	0.0546 UJ	0.0534 U	0.0554 U	0.056 U	0.0564 U
PCB-1254 (Aroclor 1254)	NS	NS	0.0546 UJ	0.0534 U	0.0154 J	0.056 U	0.0564 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0546 UJ	0.0534 U	0.0554 U	0.056 U	0.0564 U
PCB-1262 (Aroclor 1262)	NS	NS	0.0546 UJ	0.0534 U	0.0554 U	0.056 U	0.0564 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0546 UJ	0.0534 U	0.0554 U	0.056 U	0.0564 U
Total PCBs	**0.1**	1	0.0546 UJ	0.0534 UJ	0.0154 J	0.056 U	0.0844

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Polychlorinated Biphenyls (PCBs)

		AKRF Sample ID	BS-11_17_20240131	EP-01_2_20231005	EP-02_2_20231005	EP-03_2_20231005	EP-04_2_20231005
		Laboratory Sample ID	L2405262-01	L2359312-01	L2359312-02	L2359312-03	L2359312-04
		Date Sampled	1/31/2024	10/05/2023	10/05/2023	10/05/2023	10/05/2023
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0577 U	0.0564 U	0.0556 U	0.057 U	0.0594 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0577 U	0.0564 U	0.0556 U	0.057 U	0.0594 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0577 UJ	0.0564 U	0.0556 U	0.057 U	0.0594 U
PCB-1242 (Aroclor 1242)	NS	NS	0.0577 U	0.0564 U	0.0556 U	0.057 U	0.0594 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0577 U	0.0564 U	0.0556 U	0.057 U	0.0594 U
PCB-1254 (Aroclor 1254)	NS	NS	0.0577 U	0.0564 U	0.0556 U	0.057 U	0.0594 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0577 U	0.0268 J	0.0556 U	0.057 U	0.0594 U
PCB-1262 (Aroclor 1262)	NS	NS	0.0577 U	0.0564 U	0.0556 U	0.057 U	0.0594 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0577 U	0.0564 U	0.0556 U	0.057 U	0.0594 U
Total PCBs	**0.1**	1	0.0577 UJ	0.0268 J	0.0556 U	0.057 U	0.0594 U

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Polychlorinated Biphenyls (PCBs)

AKRF Sample ID			EP-05_2_20231005	EP-06_2_20231005	EP-07_2_20231005	EP-08_2_20231013	EP-09_2-6_20231215
Laboratory Sample ID			L2359312-05	L2359312-06	L2359312-07	L2359312-08	L2374328-01
Date Sampled			10/05/2023	10/05/2023	10/05/2023	10/13/2023	12/15/2023
Dilution Factor			1	1	1	1	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0522 U	0.0546 U	0.0607 UJ	0.0582 UJ	0.0552 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0522 U	0.0546 U	0.0607 UJ	0.0582 UJ	0.0552 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0522 U	0.0546 U	0.0607 UJ	0.0582 UJ	0.0552 U
PCB-1242 (Aroclor 1242)	NS	NS	0.0522 U	0.0546 U	0.0607 UJ	0.39 L	0.0552 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0522 U	0.0546 U	0.0539 J	0.0582 UJ	0.0552 U
PCB-1254 (Aroclor 1254)	NS	NS	0.0522 U	0.0241 J	0.0385 J	0.108 L	0.0552 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0108 J	0.0216 J	0.0129 J	0.0598 L	0.0552 U
PCB-1262 (Aroclor 1262)	NS	NS	0.0522 U	0.0546 U	0.0607 UJ	0.0582 UJ	0.0552 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0522 U	0.0546 U	0.0607 UJ	0.0582 UJ	0.0552 U
Total PCBs	**0.1**	1	0.0108 J	0.0457 J	**0.105 J**	**0.558 L**	0.0552 U

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Polychlorinated Biphenyls (PCBs)

		AKRF Sample ID	EP-10_2-6_20231215	SW-01_10_20231211	SW-02_10_20231211	SW-03_10_20231211	SW-04_10_20231211
		Laboratory Sample ID	L2374328-02	L2373009-01	L2373009-02	L2373009-03	L2373009-04
		Date Sampled	12/15/2023	12/11/2023	12/11/2023	12/11/2023	12/11/2023
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.0559 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.0559 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.0559 U
PCB-1242 (Aroclor 1242)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.0559 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.012 J
PCB-1254 (Aroclor 1254)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.0559 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0518 U	0.0504 UJ	0.0547 UJ	0.0526 UJ	0.0559 UJ
PCB-1262 (Aroclor 1262)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.0559 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0518 U	0.0504 U	0.0547 U	0.0526 U	0.0559 U
Total PCBs	**0.1**	1	0.0518 U	0.0504 UJ	0.0547 UJ	0.0526 UJ	0.012 J

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Polychlorinated Biphenyls (PCBs)

		AKRF Sample ID	SW-05_10_20231211	SW-06_17_20240117	SW-07_17_20240117	X-17_20240123	SW-08_17_20240117
		Laboratory Sample ID	L2373009-05	L2402735-01	L2402735-02	L2403778-04	L2402735-05
		Date Sampled	12/11/2023	1/17/2024	1/17/2024	1/23/2024	1/17/2024
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0528 U	0.066 U	0.0556 UJ	0.0614 U	0.0546 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0528 U	0.066 U	0.0556 UJ	0.0614 U	0.0546 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0528 U	0.066 UJ	0.0556 UJ	0.0614 UJ	0.0546 UJ
PCB-1242 (Aroclor 1242)	NS	NS	0.0528 U	0.066 U	0.0556 UJ	0.0414 J	0.0546 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0528 U	0.066 U	0.0556 UJ	0.0614 U	0.0546 U
PCB-1254 (Aroclor 1254)	NS	NS	0.0528 U	0.066 U	0.0556 UJ	0.00778 J	0.0546 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0528 UJ	0.066 U	0.0556 UJ	0.0614 U	0.0546 U
PCB-1262 (Aroclor 1262)	NS	NS	0.0528 U	0.066 U	0.0556 UJ	0.0614 U	0.0546 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0528 U	0.066 U	0.0556 UJ	0.0614 U	0.0546 U
Total PCBs	**0.1**	1	0.0528 UJ	0.066 UJ	0.0556 UJ	0.0492 J	0.0546 UJ

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Polychlorinated Biphenyls (PCBs)

		AKRF Sample ID	SW-09_17_20240123	SW-10_15_20240126	SW-11_17_20240126	SW-12_17_20240126	SW-13_15_20240126
		Laboratory Sample ID	L2403778-03	L2404658-01	L2404658-02	L2404658-03	L2404658-04
		Date Sampled	1/23/2024	1/26/2024	1/26/2024	1/26/2024	1/26/2024
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1242 (Aroclor 1242)	NS	NS	0.036 J	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1254 (Aroclor 1254)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1262 (Aroclor 1262)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0614 UJ	0.0573 U	0.0568 U	0.056 U	0.0626 U
Total PCBs	**0.1**	1	0.036 J	0.0573 U	0.0568 U	0.056 U	0.0626 U

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Polychlorinated Biphenyls (PCBs)

		AKRF Sample ID	SW-14_17_20240126	SW-15_17_20240126	SW-16_17_20240129	SW-17_17_20240131	UST-B_8_20231018
		Laboratory Sample ID	L2404658-05	L2404658-06	L2404867-01	L2405262-02	L2359312-13
		Date Sampled	1/26/2024	1/26/2024	1/29/2024	1/31/2024	10/18/2023
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0584 U	0.0579 U	0.0545 U	0.0577 U	0.0595 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0584 U	0.0579 U	0.0545 U	0.0577 U	0.0595 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0584 U	0.0579 U	0.0545 U	0.0577 UJ	0.0595 U
PCB-1242 (Aroclor 1242)	NS	NS	0.0584 U	0.0579 U	0.0253 J	0.0577 U	0.0595 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0584 U	0.0579 U	0.0545 U	0.0577 U	0.0595 U
PCB-1254 (Aroclor 1254)	NS	NS	0.00674 J	0.0579 U	0.018 J	0.0577 U	0.0595 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0584 U	0.0579 U	0.0545 U	0.0577 U	0.0595 UJ
PCB-1262 (Aroclor 1262)	NS	NS	0.0584 U	0.0579 U	0.0545 U	0.0577 U	0.0595 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0584 U	0.0579 U	0.0545 U	0.0577 U	0.0595 U
Total PCBs	**0.1**	1	0.00674 J	0.0579 U	0.0433 J	0.0577 UJ	0.0595 UJ

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Polychlorinated Biphenyls (PCBs)

AKRF Sample ID			UST-X_20231018	UST-EW_7_20231018	UST-NW_7_20231018	UST-SW_7_20231018	UST-WW_7_20231018
Laboratory Sample ID			L2359312-14	L2359312-12	L2359312-09	L2359312-10	L2359312-11
Date Sampled			10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023
Dilution Factor			1	1	1	1	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NS	0.0623 U	0.0619 U	0.0599 U	0.0568 U	0.0601 U
PCB-1221 (Aroclor 1221)	NS	NS	0.0623 U	0.0619 U	0.0599 U	0.0568 U	0.0601 U
PCB-1232 (Aroclor 1232)	NS	NS	0.0623 U	0.0619 U	0.0599 U	0.0568 U	0.0601 U
PCB-1242 (Aroclor 1242)	NS	NS	0.0623 U	0.0619 U	0.0599 U	0.0568 U	0.0601 U
PCB-1248 (Aroclor 1248)	NS	NS	0.0623 U	0.00973 J	0.0599 U	0.0568 U	0.0601 U
PCB-1254 (Aroclor 1254)	NS	NS	0.0623 U	0.0619 U	0.0599 U	0.0568 U	0.0601 U
PCB-1260 (Aroclor 1260)	NS	NS	0.0623 UJ	0.0619 UJ	0.0599 UJ	0.0568 UJ	0.0601 UJ
PCB-1262 (Aroclor 1262)	NS	NS	0.0623 U	0.0619 U	0.0599 U	0.0568 U	0.0601 U
PCB-1268 (Aroclor 1268)	NS	NS	0.0623 U	0.0619 U	0.0599 U	0.0568 U	0.0601 U
Total PCBs	**0.1**	1	0.0623 UJ	0.00973 J	0.0599 UJ	0.0568 UJ	0.0601 UJ

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Soil Documentation Analytical Results
Pesticides

		AKRF Sample ID	BS-01_15_20231212	BS-02_15_20231212	BS-03_15_20231212	BS-04_17_20240117	BS-05_17_20240117
		Laboratory Sample ID	L2373009-06	L2373009-07	L2373009-08	L2402735-03	L2402735-04
		Date Sampled	12/12/2023	12/12/2023	12/12/2023	1/17/2024	1/17/2024
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.00074 U	0.000755 U	0.000761 U	0.000793 U	0.000743 U
Alpha Endosulfan	NS	NS	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
Beta Endosulfan	NS	NS	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
Chlordane, Total	NS	NS	0.0148 U	0.0151 U	0.0152 U	0.0159 U	0.0148 U
cis-Chlordane	0.014	0.65	0.00222 U	0.00226 U	0.00228 U	0.00238 U	0.00223 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
Dieldrin	0.005	0.075	0.00111 U	0.00113 U	0.00114 U	0.00119 U	0.00111 U
Endosulfan Sulfate	NS	NS	0.00074 U	0.000755 U	0.000761 U	0.000793 U	0.000743 U
Endrin	0.014	5.3	0.00074 U	0.000755 U	0.000761 U	0.000793 U	0.000743 U
Endrin Aldehyde	NS	NS	0.00222 U	0.00226 U	0.00228 U	0.00238 U	0.00223 U
Endrin Ketone	NS	NS	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
Gamma Bhc (Lindane)	0.026	0.24	0.00074 U	0.000755 U	0.000761 U	0.000793 U	0.000743 U
Heptachlor	0.013	0.53	0.000888 U	0.000906 U	0.000913 U	0.000952 U	0.000891 U
Heptachlor Epoxide	NS	NS	0.00333 U	0.0034 U	0.00342 U	0.00357 U	0.00334 U
Methoxychlor	NS	NS	0.00333 U	0.0034 U	0.00342 U	0.00357 U	0.00334 U
P,P'-DDD	0.0033	5	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
P,P'-DDE	0.0033	3.4	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
P,P'-DDT	**0.0033**	3.8	0.00178 U	0.00181 U	0.00183 U	0.0019 U	0.00178 U
Toxaphene	NS	NS	0.0333 U	0.034 U	0.0342 U	0.0357 U	0.0334 U
trans-Chlordane	NS	NS	0.00222 U	0.00226 U	0.00228 U	0.00238 U	0.00223 U

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Soil Documentation Analytical Results
Pesticides

AKRF Sample ID			BS-06_17_20240123	BS-07_17_20240123	BS-08_17_20240126	BS-09_17_20240126	BS-10_17_20240129
Laboratory Sample ID			L2403778-01	L2403778-02	L2404658-07	L2404658-08	L2404867-02
Date Sampled			1/23/2024	1/23/2024	1/26/2024	1/26/2024	1/29/2024
Dilution Factor			1	1	1	1	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000751 U	0.000744 U	0.000768 U	0.000779 U	0.00074 UJ
Alpha Endosulfan	NS	NS	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
Beta Endosulfan	NS	NS	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
Chlordane, Total	NS	NS	0.015 U	0.0149 U	0.0154 U	0.0156 U	0.0148 UJ
cis-Chlordane	0.014	0.65	0.00225 U	0.00223 U	0.0023 U	0.00234 U	0.00222 UJ
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
Dieldrin	0.005	0.075	0.00113 U	0.00112 U	0.00115 U	0.00117 U	0.00111 UJ
Endosulfan Sulfate	NS	NS	0.000751 U	0.000744 U	0.000768 U	0.000779 U	0.00074 UJ
Endrin	0.014	5.3	0.000751 U	0.000744 U	0.000768 U	0.000779 U	0.00074 UJ
Endrin Aldehyde	NS	NS	0.00225 U	0.00223 U	0.0023 U	0.00234 U	0.00222 UJ
Endrin Ketone	NS	NS	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
Gamma Bhc (Lindane)	0.026	0.24	0.000751 U	0.000744 U	0.000768 U	0.000779 U	0.00074 UJ
Heptachlor	0.013	0.53	0.000901 U	0.000892 U	0.000922 U	0.000934 U	0.000888 UJ
Heptachlor Epoxide	NS	NS	0.00338 U	0.00335 U	0.00346 U	0.0035 U	0.00333 UJ
Methoxychlor	NS	NS	0.00338 U	0.00335 U	0.00346 U	0.0035 U	0.00333 UJ
P,P'-DDD	0.0033	5	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
P,P'-DDE	0.0033	3.4	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
P,P'-DDT	**0.0033**	3.8	0.0018 U	0.00178 U	0.00184 U	0.00187 U	0.00178 UJ
Toxaphene	NS	NS	0.0338 U	0.0335 U	0.0346 U	0.035 U	0.0333 UJ
trans-Chlordane	NS	NS	0.00225 U	0.00223 U	0.0023 U	0.00234 U	0.00222 UJ

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Pesticides

		AKRF Sample ID	BS-11_17_20240131	EP-01_2_20231005	EP-02_2_20231005	EP-03_2_20231005	EP-04_2_20231005
		Laboratory Sample ID	L2405262-01	L2359312-01	L2359312-02	L2359312-03	L2359312-04
		Date Sampled	1/31/2024	10/05/2023	10/05/2023	10/05/2023	10/05/2023
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000767 U	0.000766 U	0.000731 U	0.000747 U	0.000782 U
Alpha Endosulfan	NS	NS	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
Beta Endosulfan	NS	NS	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
Chlordane, Total	NS	NS	0.0153 UJ	0.0153 UJ	0.0146 UJ	0.0149 UJ	0.0156 UJ
cis-Chlordane	0.014	0.65	0.0023 U	0.0023 U	0.00219 U	0.00224 U	0.00234 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
Dieldrin	0.005	0.075	0.00115 U	0.00115 U	0.0011 U	0.00112 U	0.00117 U
Endosulfan Sulfate	NS	NS	0.000767 U	0.000766 U	0.000731 U	0.000747 U	0.000782 U
Endrin	0.014	5.3	0.000767 U	0.000766 U	0.000731 U	0.000747 U	0.000782 U
Endrin Aldehyde	NS	NS	0.0023 U	0.0023 U	0.00219 U	0.00224 U	0.00234 U
Endrin Ketone	NS	NS	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
Gamma Bhc (Lindane)	0.026	0.24	0.000767 U	0.000766 U	0.000731 U	0.000747 U	0.000782 U
Heptachlor	0.013	0.53	0.000921 U	0.000919 U	0.000877 U	0.000896 U	0.000938 U
Heptachlor Epoxide	NS	NS	0.00345 U	0.00344 UJ	0.00329 UJ	0.00336 UJ	0.00352 UJ
Methoxychlor	NS	NS	0.00345 U	0.00344 U	0.00329 U	0.00336 U	0.00352 U
P,P'-DDD	0.0033	5	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
P,P'-DDE	0.0033	3.4	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
P,P'-DDT	**0.0033**	3.8	0.00184 U	0.00184 U	0.00175 U	0.00179 U	0.00188 U
Toxaphene	NS	NS	0.0345 U	0.0344 U	0.0329 U	0.0336 U	0.0352 U
trans-Chlordane	NS	NS	0.0023 U	0.0023 U	0.00219 U	0.00224 U	0.00234 U

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		AKRF Sample ID	EP-05_2_20231005	EP-06_2_20231005	EP-07_2_20231005	EP-08_2_20231013	EP-09_2-6_20231215
		Laboratory Sample ID	L2359312-05	L2359312-06	L2359312-07	L2359312-08	L2374328-01
		Date Sampled	10/05/2023	10/05/2023	10/05/2023	10/13/2023	12/15/2023
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000717 U	0.000752 U	0.000811 U	0.000794 UJ	0.000765 U
Alpha Endosulfan	NS	NS	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
Beta Endosulfan	NS	NS	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
Chlordane, Total	NS	NS	0.0143 UJ	0.015 UJ	0.0162 UJ	0.0159 UJ	0.0153 UJ
cis-Chlordane	0.014	0.65	0.00215 U	0.00225 U	0.00243 U	0.00238 UJ	0.00229 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
Dieldrin	0.005	0.075	0.00108 U	0.00113 U	0.00122 U	0.00119 UJ	0.00115 U
Endosulfan Sulfate	NS	NS	0.000717 U	0.000752 U	0.000811 U	0.000794 UJ	0.000765 U
Endrin	0.014	5.3	0.000717 U	0.000752 U	0.000811 U	0.000794 UJ	0.000765 U
Endrin Aldehyde	NS	NS	0.00215 U	0.00225 U	0.00243 U	0.00238 UJ	0.00229 U
Endrin Ketone	NS	NS	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
Gamma Bhc (Lindane)	0.026	0.24	0.000717 U	0.000752 U	0.000811 U	0.000794 UJ	0.000765 U
Heptachlor	0.013	0.53	0.00086 U	0.000902 U	0.000973 U	0.000952 UJ	0.000918 U
Heptachlor Epoxide	NS	NS	0.00323 UJ	0.00338 UJ	0.00365 UJ	0.00357 UJ	0.00344 U
Methoxychlor	NS	NS	0.00323 U	0.00338 U	0.00365 U	0.00357 UJ	0.00344 U
P,P'-DDD	0.0033	5	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
P,P'-DDE	0.0033	3.4	0.00172 U	0.0018 U	0.00195 U	0.0019 UJ	0.00184 U
P,P'-DDT	**0.0033**	3.8	0.00172 U	0.0018 U	0.00195 U	**0.0251 J**	0.00184 U
Toxaphene	NS	NS	0.0323 U	0.0338 U	0.0365 U	0.0357 UJ	0.0344 UJ
trans-Chlordane	NS	NS	0.00215 U	0.00225 U	0.00243 U	0.00238 UJ	0.00229 U

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		AKRF Sample ID	EP-10_2-6_20231215	SW-01_10_20231211	SW-02_10_20231211	SW-03_10_20231211	SW-04_10_20231211
		Laboratory Sample ID	L2374328-02	L2373009-01	L2373009-02	L2373009-03	L2373009-04
		Date Sampled	12/15/2023	12/11/2023	12/11/2023	12/11/2023	12/11/2023
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000693 U	0.000717 U	0.000715 U	0.000714 U	0.000719 U
Alpha Endosulfan	NS	NS	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
Beta Endosulfan	NS	NS	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
Chlordane, Total	NS	NS	0.0138 UJ	0.0143 U	0.0143 U	0.0143 U	0.0144 U
cis-Chlordane	0.014	0.65	0.00208 U	0.00215 U	0.00214 U	0.00214 U	0.00216 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
Dieldrin	0.005	0.075	0.00104 U	0.00108 U	0.00107 U	0.00107 U	0.00108 U
Endosulfan Sulfate	NS	NS	0.000693 U	0.000717 U	0.000715 U	0.000714 U	0.000719 U
Endrin	0.014	5.3	0.000693 U	0.000717 U	0.000715 U	0.000714 U	0.000719 U
Endrin Aldehyde	NS	NS	0.00208 U	0.00215 U	0.00214 U	0.00214 U	0.00216 U
Endrin Ketone	NS	NS	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
Gamma Bhc (Lindane)	0.026	0.24	0.000693 U	0.000717 U	0.000715 U	0.000714 U	0.000719 U
Heptachlor	0.013	0.53	0.000831 U	0.00086 U	0.000858 U	0.000857 U	0.000863 U
Heptachlor Epoxide	NS	NS	0.00312 U	0.00323 U	0.00322 U	0.00321 U	0.00324 U
Methoxychlor	NS	NS	0.00312 U	0.00323 U	0.00322 U	0.00321 U	0.00324 U
P,P'-DDD	0.0033	5	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
P,P'-DDE	0.0033	3.4	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
P,P'-DDT	**0.0033**	3.8	0.00166 U	0.00172 U	0.00172 U	0.00171 U	0.00173 U
Toxaphene	NS	NS	0.0312 UJ	0.0323 U	0.0322 U	0.0321 U	0.0324 U
trans-Chlordane	NS	NS	0.00208 U	0.00215 U	0.00214 U	0.00214 U	0.00216 U

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AKRF Sample ID			SW-05_10_20231211	SW-06_17_20240117	SW-07_17_20240117	X-17_20240123	SW-08_17_20240117
Laboratory Sample ID			L2373009-05	L2402735-01	L2402735-02	L2403778-04	L2402735-05
Date Sampled			12/11/2023	1/17/2024	1/17/2024	1/23/2024	1/17/2024
Dilution Factor			1	1	1	1	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000716 U	0.000896 U	0.000761 U	0.000826 U	0.000745 U
Alpha Endosulfan	NS	NS	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
Beta Endosulfan	NS	NS	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
Chlordane, Total	NS	NS	0.0143 U	0.0179 U	0.0152 U	0.0165 U	0.0149 U
cis-Chlordane	0.014	0.65	0.00215 U	0.00269 U	0.00228 U	0.00248 U	0.00224 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
Dieldrin	0.005	0.075	0.00107 U	0.00134 U	0.00114 U	0.00124 U	0.00112 U
Endosulfan Sulfate	NS	NS	0.000716 U	0.000896 U	0.000761 U	0.000826 U	0.000745 U
Endrin	0.014	5.3	0.000716 U	0.000896 U	0.000761 U	0.000826 U	0.000745 U
Endrin Aldehyde	NS	NS	0.00215 U	0.00269 U	0.00228 U	0.00248 U	0.00224 U
Endrin Ketone	NS	NS	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
Gamma Bhc (Lindane)	0.026	0.24	0.000716 U	0.000896 U	0.000761 U	0.000826 U	0.000745 U
Heptachlor	0.013	0.53	0.000859 U	0.00108 U	0.000913 U	0.000992 U	0.000894 U
Heptachlor Epoxide	NS	NS	0.00322 U	0.00403 U	0.00342 U	0.00372 U	0.00335 U
Methoxychlor	NS	NS	0.00322 U	0.00403 U	0.00342 U	0.00372 U	0.00335 U
P,P'-DDD	0.0033	5	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
P,P'-DDE	0.0033	3.4	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
P,P'-DDT	**0.0033**	3.8	0.00172 U	0.00215 U	0.00183 U	0.00198 U	0.00179 U
Toxaphene	NS	NS	0.0322 U	0.0403 U	0.0342 U	0.0372 U	0.0335 U
trans-Chlordane	NS	NS	0.00215 U	0.00269 U	0.00228 U	0.00248 U	0.00224 U

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AKRF Sample ID			SW-09_17_20240123	SW-10_15_20240126	SW-11_17_20240126	SW-12_17_20240126	SW-13_15_20240126
Laboratory Sample ID			L2403778-03	L2404658-01	L2404658-02	L2404658-03	L2404658-04
Date Sampled			1/23/2024	1/26/2024	1/26/2024	1/26/2024	1/26/2024
Dilution Factor			1	1	1	1	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000835 U	0.000774 U	0.000744 U	0.000762 U	0.000826 U
Alpha Endosulfan	NS	NS	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
Beta Endosulfan	NS	NS	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
Chlordane, Total	NS	NS	0.0167 U	0.0155 U	0.0149 U	0.0152 U	0.0165 U
cis-Chlordane	0.014	0.65	0.0025 U	0.00232 U	0.00223 U	0.00229 U	0.00248 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
Dieldrin	0.005	0.075	0.00125 U	0.00116 U	0.00112 U	0.00114 U	0.00124 U
Endosulfan Sulfate	NS	NS	0.000835 U	0.000774 U	0.000744 U	0.000762 U	0.000826 U
Endrin	0.014	5.3	0.000835 U	0.000774 U	0.000744 U	0.000762 U	0.000826 U
Endrin Aldehyde	NS	NS	0.0025 U	0.00232 U	0.00223 U	0.00229 U	0.00248 U
Endrin Ketone	NS	NS	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
Gamma Bhc (Lindane)	0.026	0.24	0.000835 U	0.000774 U	0.000744 U	0.000762 U	0.000826 U
Heptachlor	0.013	0.53	0.001 U	0.000928 U	0.000893 U	0.000915 U	0.000991 U
Heptachlor Epoxide	NS	NS	0.00376 U	0.00348 U	0.00335 U	0.00343 U	0.00372 U
Methoxychlor	NS	NS	0.00376 U	0.00348 U	0.00335 U	0.00343 U	0.00372 U
P,P'-DDD	0.0033	5	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
P,P'-DDE	0.0033	3.4	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
P,P'-DDT	**0.0033**	3.8	0.002 U	0.00186 U	0.00179 U	0.00183 U	0.00198 U
Toxaphene	NS	NS	0.0376 U	0.0348 U	0.0335 U	0.0343 U	0.0372 U
trans-Chlordane	NS	NS	0.0025 U	0.00232 U	0.00223 U	0.00229 U	0.00248 U

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AKRF Sample ID			SW-14_17_20240126	SW-15_17_20240126	SW-16_17_20240129	SW-17_17_20240131	UST-B_8_20231018
Laboratory Sample ID			L2404658-05	L2404658-06	L2404867-01	L2405262-02	L2359312-13
Date Sampled			1/26/2024	1/26/2024	1/29/2024	1/31/2024	10/18/2023
Dilution Factor			1	1	1	1	1
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000764 U	0.000784 U	0.000759 U	0.000771 U	0.000781 U
Alpha Endosulfan	NS	NS	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
Beta Endosulfan	NS	NS	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
Chlordane, Total	NS	NS	0.0153 U	0.0157 U	0.0152 U	0.0154 UJ	0.0156 UJ
cis-Chlordane	0.014	0.65	0.00229 U	0.00235 U	0.00228 U	0.00231 U	0.00234 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
Dieldrin	0.005	0.075	0.00114 U	0.00118 U	0.00114 U	0.00116 U	0.00117 U
Endosulfan Sulfate	NS	NS	0.000764 U	0.000784 U	0.000759 U	0.000771 U	0.000781 U
Endrin	0.014	5.3	0.000764 U	0.000784 U	0.000759 U	0.000771 U	0.000781 U
Endrin Aldehyde	NS	NS	0.00229 U	0.00235 U	0.00228 U	0.00231 U	0.00234 U
Endrin Ketone	NS	NS	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
Gamma Bhc (Lindane)	0.026	0.24	0.000764 U	0.000784 U	0.000759 U	0.000771 U	0.000781 U
Heptachlor	0.013	0.53	0.000916 U	0.000941 U	0.00091 U	0.000925 U	0.000937 U
Heptachlor Epoxide	NS	NS	0.00344 U	0.00353 U	0.00341 U	0.00347 U	0.00351 U
Methoxychlor	NS	NS	0.00344 U	0.00353 U	0.00341 U	0.00347 U	0.00351 U
P,P'-DDD	0.0033	5	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
P,P'-DDE	0.0033	3.4	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
P,P'-DDT	**0.0033**	3.8	0.00183 U	0.00188 U	0.00182 U	0.00185 U	0.00187 U
Toxaphene	NS	NS	0.0344 U	0.0353 U	0.0341 U	0.0347 U	0.0351 U
trans-Chlordane	NS	NS	0.00229 U	0.00235 U	0.00228 U	0.00231 U	0.00234 U

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		AKRF Sample ID	UST-X_20231018	UST-EW_7_20231018	UST-NW_7_20231018	UST-SW_7_20231018	UST-WW_7_20231018
		Laboratory Sample ID	L2359312-14	L2359312-12	L2359312-09	L2359312-10	L2359312-11
		Date Sampled	10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023
		Dilution Factor	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	**NYSDEC UUSCO**	**NYSDEC RRSCO**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.0048	0.044	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.22	0.000834 U	0.000806 U	0.000838 U	0.00219 U	0.000807 U
Alpha Endosulfan	NS	NS	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.021	0.18	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
Beta Endosulfan	NS	NS	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
Chlordane, Total	NS	NS	0.0167 UJ	0.0161 UJ	0.0168 UJ	0.0438 UJ	0.0161 UJ
cis-Chlordane	0.014	0.65	0.0025 U	0.00242 U	0.00252 U	0.00656 U	0.00242 U
Delta BHC (Delta Hexachlorocyclohexane)	0.024	100	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
Dieldrin	0.005	0.075	0.00125 U	0.00121 U	0.00126 U	0.00328 U	0.00121 U
Endosulfan Sulfate	NS	NS	0.000834 U	0.000806 U	0.000838 U	0.00219 U	0.000807 U
Endrin	0.014	5.3	0.000834 U	0.000806 U	0.000838 U	0.00219 U	0.000807 U
Endrin Aldehyde	NS	NS	0.0025 U	0.00242 U	0.00252 U	0.00656 U	0.00242 U
Endrin Ketone	NS	NS	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
Gamma Bhc (Lindane)	0.026	0.24	0.000834 U	0.000806 U	0.000838 U	0.00219 U	0.000807 U
Heptachlor	0.013	0.53	0.001 U	0.000967 U	0.00101 U	0.00262 U	0.000969 U
Heptachlor Epoxide	NS	NS	0.00375 U	0.00363 U	0.00377 U	0.00985 U	0.00363 U
Methoxychlor	NS	NS	0.00375 U	0.00363 U	0.00377 U	0.00985 U	0.00363 U
P,P'-DDD	0.0033	5	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
P,P'-DDE	0.0033	3.4	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
P,P'-DDT	**0.0033**	3.8	0.002 U	0.00193 U	0.00201 U	0.00525 U	0.00194 U
Toxaphene	NS	NS	0.0375 U	0.0363 U	0.0377 U	0.0985 U	0.0363 U
trans-Chlordane	NS	NS	0.0025 U	0.00242 U	0.00252 U	0.00656 U	0.00242 U

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Per- and Polyfluoroalkyl Substances (PFAS)

		AKRF Sample ID	BS-01_15_20231212	BS-02_15_20231212	BS-03_15_20231212	BS-04_17_20240117	BS-05_17_20240117
		Laboratory Sample ID	L2373010-06	L2373010-07	L2373010-08	L2402748-03	L2402748-04
		Date Sampled	12/12/2023	12/12/2023	12/12/2023	1/17/2024	1/17/2024
		Dilution Factor	1	1	1	1	1
		Unit	ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.537 U	0.57 U	0.532 U	0.607 U	0.581 U
8:2 Fluorotelomer sulfonate	NS	NS	0.537 U	0.57 U	0.532 U	0.607 U	0.581 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.537 UJ	0.57 UJ	0.532 UJ	0.607 UJ	0.581 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.537 UJ	0.57 UJ	0.532 UJ	0.607 UJ	0.581 UJ
Perfluorobutanesulfonic acid	NS	NS	0.268 U	0.285 U	0.266 U	0.303 U	0.29 U
Perfluorobutanoic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 UJ	0.581 U
Perfluorodecanesulfonic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 U	0.581 U
Perfluorodecanoic acid	NS	NS	0.268 U	0.285 U	0.266 U	0.303 UJ	0.29 U
Perfluorododecanoic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 UJ	0.581 U
Perfluoroheptanesulfonic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 U	0.581 U
Perfluoroheptanoic acid	NS	NS	0.268 U	0.285 U	0.266 U	0.303 UJ	0.29 U
Perfluorohexanesulfonic acid	NS	NS	0.268 U	0.285 U	0.266 U	0.303 U	0.29 U
Perfluorohexanoic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 UJ	0.581 U
Perfluorononanoic acid	NS	NS	0.268 U	0.285 U	0.266 U	0.303 UJ	0.29 U
Perfluorooctanesulfonamide	NS	NS	0.537 U	0.57 U	0.532 U	0.607 U	0.581 U
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.165 J	0.285 U	0.266 U	0.303 U	0.29 U
Perfluorooctanoic acid (PFOA)	0.66	33	0.268 U	0.285 U	0.266 U	0.063 J	0.29 U
Perfluoropentanoic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 UJ	0.581 U
Perfluorotetradecanoic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 UJ	0.581 U
Perfluorotridecanoic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 U	0.581 U
Perfluoroundecanoic acid	NS	NS	0.537 U	0.57 U	0.532 U	0.607 UJ	0.581 U
TOTAL PFOA AND PFOS	NS	NS	0.165 J	0.285 U	0.266 U	0.063 J	0.29 U

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Per- and Polyfluoroalkyl Substances (PFAS)

		AKRF Sample ID	BS-06_17_20240123	BS-07_17_20240123	BS-08_17_20240126	BS-09_17_20240126	BS-10_17_20240129
		Laboratory Sample ID	L2403781-01	L2403781-02	L2404670-07	L2404670-08	L2404883-02
		Date Sampled	1/23/2024	1/23/2024	1/26/2024	1/26/2024	1/29/2024
		Dilution Factor	1	1	1	1	1
		Unit	ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	2.33 UJ	2.21 UJ	0.553 U	0.574 U	0.594 U
8:2 Fluorotelomer sulfonate	NS	NS	2.33 U	2.21 U	0.553 U	0.574 U	0.594 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	2.33 UJ	2.21 UJ	0.553 UJ	0.574 UJ	0.594 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	2.33 UJ	2.21 UJ	0.553 UJ	0.574 UJ	0.594 UJ
Perfluorobutanesulfonic acid	NS	NS	1.16 U	1.1 U	0.276 U	0.287 U	0.297 U
Perfluorobutanoic acid	NS	NS	2.33 R	2.21 R	0.553 U	0.574 U	0.594 U
Perfluorodecanesulfonic acid	NS	NS	2.33 U	2.21 U	0.553 U	0.574 U	0.594 U
Perfluorodecanoic acid	NS	NS	1.16 UJ	1.1 U	0.276 U	0.287 U	0.297 U
Perfluorododecanoic acid	NS	NS	2.33 U	2.21 U	0.553 U	0.574 U	0.594 U
Perfluoroheptanesulfonic acid	NS	NS	2.33 U	2.21 U	0.553 U	0.574 U	0.594 U
Perfluoroheptanoic acid	NS	NS	1.16 UJ	1.1 R	0.276 U	0.287 U	0.297 U
Perfluorohexanesulfonic acid	NS	NS	1.16 U	1.1 U	0.276 U	0.287 U	0.297 U
Perfluorohexanoic acid	NS	NS	2.33 R	2.21 R	0.553 U	0.574 U	0.594 U
Perfluorononanoic acid	NS	NS	1.16 UJ	1.1 UJ	0.276 U	0.287 U	0.297 U
Perfluorooctanesulfonamide	NS	NS	0.597 UJ	0.563 U	0.553 U	0.574 U	0.594 U
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	1.16 U	1.1 U	0.276 U	0.287 U	0.297 U
Perfluorooctanoic acid (PFOA)	0.66	33	1.16 UJ	1.1 J	0.276 U	0.287 U	0.297 U
Perfluoropentanoic acid	NS	NS	2.33 R	2.21 R	0.553 U	0.574 U	0.594 U
Perfluorotetradecanoic acid	NS	NS	2.33 U	2.21 UJ	0.553 U	0.574 U	0.594 U
Perfluorotridecanoic acid	NS	NS	2.33 U	2.21 U	0.553 U	0.574 U	0.594 U
Perfluoroundecanoic acid	NS	NS	2.33 UJ	2.21 UJ	0.553 U	0.574 U	0.594 U
TOTAL PFOA AND PFOS	NS	NS	1.16 U	1.1 U	0.276 U	0.287 U	0.297 U

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Per- and Polyfluoroalkyl Substances (PFAS)

		AKRF Sample ID	BS-11_17_20240131	EP-01_2_20231005	EP-02_2_20231005	EP-03_2_20231005	EP-04_2_20231005
		Laboratory Sample ID	L2405264-01	L2359390-01	L2359390-02	L2359390-03	L2359390-04
		Date Sampled	1/31/2024	10/05/2023	10/05/2023	10/05/2023	10/05/2023
		Dilution Factor	1	1	1	1	1
		Unit	ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.608 U	0.545 U	0.549 U	0.54 U	0.635 U
8:2 Fluorotelomer sulfonate	NS	NS	0.608 U	0.545 U	0.549 U	0.54 U	0.635 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.608 UJ	0.545 UJ	0.549 UJ	0.108 J	0.635 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.608 UJ	0.545 UJ	0.549 UJ	0.54 UJ	0.635 UJ
Perfluorobutanesulfonic acid	NS	NS	0.304 U	0.272 U	0.274 U	0.27 U	0.317 U
Perfluorobutanoic acid	NS	NS	0.608 UJ	0.545 U	0.549 U	0.54 U	0.635 U
Perfluorodecanesulfonic acid	NS	NS	0.608 U	0.545 U	0.549 U	0.54 U	0.635 U
Perfluorodecanoic acid	NS	NS	0.304 UJ	0.272 U	0.274 U	0.27 U	0.317 U
Perfluorododecanoic acid	NS	NS	0.608 UJ	0.545 U	0.549 U	0.54 U	0.635 U
Perfluoroheptanesulfonic acid	NS	NS	0.608 U	0.545 U	0.549 U	0.54 U	0.635 U
Perfluoroheptanoic acid	NS	NS	1.32 UJ	0.272 U	0.274 U	0.27 U	0.317 U
Perfluorohexanesulfonic acid	NS	NS	0.304 U	0.272 U	0.274 U	0.27 U	0.317 U
Perfluorohexanoic acid	NS	NS	2.63 UJ	0.545 U	0.549 U	0.54 U	0.635 U
Perfluorononanoic acid	NS	NS	0.304 UJ	0.272 U	0.274 U	0.27 U	0.317 U
Perfluorooctanesulfonamide	NS	NS	0.608 U	0.545 U	0.549 U	0.54 U	0.635 U
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.304 U	0.462	0.146 J	0.626	0.22 J
Perfluorooctanoic acid (PFOA)	0.66	33	0.115 J	0.068 J	0.274 U	0.364	0.317 U
Perfluoropentanoic acid	NS	NS	0.608 UJ	0.052 J	0.055 J	0.54 U	0.635 U
Perfluorotetradecanoic acid	NS	NS	0.608 UJ	0.545 U	0.549 U	0.54 U	0.635 U
Perfluorotridecanoic acid	NS	NS	0.608 U	0.545 U	0.549 U	0.54 U	0.635 U
Perfluoroundecanoic acid	NS	NS	0.608 UJ	0.545 U	0.549 U	0.54 U	0.635 U
TOTAL PFOA AND PFOS	NS	NS	0.115 J	0.53 J	0.146 J	0.99	0.22 J

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Per- and Polyfluoroalkyl Substances (PFAS)

		AKRF Sample ID	EP-05_2_20231005	EP-06_2_20231005	EP-07_2_20231005	EP-08_2_20231013	EP-09_2-6_20231215
		Laboratory Sample ID	L2359390-05	L2359390-06	L2359390-07	L2359390-09	L2374365-01
		Date Sampled	10/05/2023	10/05/2023	10/05/2023	10/13/2023	12/15/2023
		Dilution Factor	1	1	1	1	1
		Unit	ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
8:2 Fluorotelomer sulfonate	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.542 UJ	0.595 UJ	0.62 UJ	0.58 UJ	0.536 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.542 UJ	0.595 UJ	0.62 UJ	0.58 UJ	0.536 U
Perfluorobutanesulfonic acid	NS	NS	0.271 U	0.297 U	0.31 U	0.29 U	0.268 U
Perfluorobutanoic acid	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
Perfluorodecanesulfonic acid	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
Perfluorodecanoic acid	NS	NS	0.115 J	0.297 U	0.31 U	0.29 U	0.268 U
Perfluorododecanoic acid	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
Perfluoroheptanesulfonic acid	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
Perfluoroheptanoic acid	NS	NS	0.271 U	0.297 U	0.31 U	0.29 U	0.268 U
Perfluorohexanesulfonic acid	NS	NS	0.271 U	0.297 U	0.31 U	0.29 U	0.268 U
Perfluorohexanoic acid	NS	NS	0.075 J	0.595 U	0.62 U	0.063 J	0.536 U
Perfluorononanoic acid	NS	NS	0.271 U	0.297 U	0.31 U	0.29 U	0.268 U
Perfluorooctanesulfonamide	NS	NS	0.542 U	0.595 UJ	0.62 U	0.58 UJ	0.536 UJ
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.311	0.275 J	0.219 J	**1.82**	0.462
Perfluorooctanoic acid (PFOA)	0.66	33	0.271 U	0.297 U	0.31 U	0.191 J	0.148 J
Perfluoropentanoic acid	NS	NS	0.08 J	0.595 U	0.62 U	0.58 U	0.07 J
Perfluorotetradecanoic acid	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
Perfluorotridecanoic acid	NS	NS	0.542 U	0.595 U	0.62 U	0.58 U	0.536 U
Perfluoroundecanoic acid	NS	NS	0.069 J	0.595 U	0.62 U	0.58 U	0.536 U
TOTAL PFOA AND PFOS	NS	NS	0.311	0.275 J	0.219 J	2.01 J	0.61 J

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Per- and Polyfluoroalkyl Substances (PFAS)

AKRF Sample ID			EP-10_2-6_20231215	SW-01_10_20231211	SW-02_10_20231211	SW-03_10_20231211	SW-04_10_20231211
Laboratory Sample ID			L2374365-02	L2373010-01	L2373010-02	L2373010-03	L2373010-04
Date Sampled			12/15/2023	12/11/2023	12/11/2023	12/11/2023	12/11/2023
Dilution Factor			1	1	1	1	1
Unit			ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
8:2 Fluorotelomer sulfonate	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.537 U	0.552 UJ	0.539 UJ	0.504 UJ	0.536 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.537 U	0.552 UJ	0.539 UJ	0.504 UJ	0.536 UJ
Perfluorobutanesulfonic acid	NS	NS	0.268 U	0.276 U	0.27 U	0.252 U	0.268 U
Perfluorobutanoic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluorodecanesulfonic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluorodecanoic acid	NS	NS	0.268 U	0.276 U	0.27 U	0.252 U	0.268 U
Perfluorododecanoic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluoroheptanesulfonic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluoroheptanoic acid	NS	NS	0.268 U	0.276 U	0.27 U	0.252 U	0.268 U
Perfluorohexanesulfonic acid	NS	NS	0.268 U	0.276 U	0.27 U	0.252 U	0.268 U
Perfluorohexanoic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluorononanoic acid	NS	NS	0.268 U	0.276 U	0.27 U	0.252 U	0.268 U
Perfluorooctanesulfonamide	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.268 U	0.256 J	0.27 U	0.435	0.268 U
Perfluorooctanoic acid (PFOA)	0.66	33	0.268 U	0.276 U	0.106 J	0.252 U	0.099 J
Perfluoropentanoic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluorotetradecanoic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluorotridecanoic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
Perfluoroundecanoic acid	NS	NS	0.537 U	0.552 U	0.539 U	0.504 U	0.536 U
TOTAL PFOA AND PFOS	NS	NS	0.268 U	0.256 J	0.106 J	0.435	0.099 J

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Per- and Polyfluoroalkyl Substances (PFAS)

AKRF Sample ID			SW-05_10_20231211	SW-06_17_20240117	SW-07_17_20240117	X-17_20240123	SW-08_17_20240117
Laboratory Sample ID			L2373010-05	L2402748-01	L2402748-02	L2403781-05	L2402748-05
Date Sampled			12/11/2023	1/17/2024	1/17/2024	1/23/2024	1/17/2024
Dilution Factor			1	1	1	1	1
Unit			ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.526 U	0.636 U	0.593 U	0.674 J	0.575 U
8:2 Fluorotelomer sulfonate	NS	NS	0.526 U	0.636 U	0.593 U	0.767 U	0.575 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.526 UJ	0.636 UJ	0.593 UJ	0.767 UJ	0.575 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.526 UJ	0.636 UJ	0.593 UJ	0.767 UJ	0.575 UJ
Perfluorobutanesulfonic acid	NS	NS	0.263 U	0.318 U	0.296 U	0.384 U	0.288 U
Perfluorobutanoic acid	NS	NS	0.526 U	0.636 UJ	0.593 U	0.767 UJ	0.575 U
Perfluorodecanesulfonic acid	NS	NS	0.526 U	0.636 U	0.593 U	0.767 U	0.575 U
Perfluorodecanoic acid	NS	NS	0.139 J	0.318 UJ	0.296 U	0.384 UJ	0.288 U
Perfluorododecanoic acid	NS	NS	0.526 U	0.636 UJ	0.593 U	0.767 UJ	0.575 U
Perfluoroheptanesulfonic acid	NS	NS	0.526 U	0.636 U	0.593 U	0.767 U	0.575 U
Perfluoroheptanoic acid	NS	NS	0.263 U	0.318 UJ	0.296 U	0.384 UJ	0.288 U
Perfluorohexanesulfonic acid	NS	NS	0.263 U	0.318 U	0.296 U	0.384 U	0.288 U
Perfluorohexanoic acid	NS	NS	0.526 U	0.636 UJ	0.593 U	0.767 UJ	0.575 U
Perfluorononanoic acid	NS	NS	0.263 U	0.318 UJ	0.296 U	0.384 UJ	0.288 U
Perfluorooctanesulfonamide	NS	NS	0.526 U	0.636 U	0.593 U	0.767 U	0.575 U
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.448	0.318 U	0.296 U	0.384 U	0.288 U
Perfluorooctanoic acid (PFOA)	0.66	33	0.148 J	0.318 UJ	0.296 U	0.164 J	0.288 U
Perfluoropentanoic acid	NS	NS	0.526 U	0.636 UJ	0.593 U	0.767 UJ	0.575 U
Perfluorotetradecanoic acid	NS	NS	0.526 U	0.636 UJ	0.593 U	0.767 UJ	0.575 U
Perfluorotridecanoic acid	NS	NS	0.526 U	0.636 U	0.593 U	0.767 U	0.575 U
Perfluoroundecanoic acid	NS	NS	0.526 U	0.636 U	0.593 U	0.767 UJ	0.575 U
TOTAL PFOA AND PFOS	NS	NS	0.596 J	0.318 U	0.296 U	0.164 J	0.288 U

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Per- and Polyfluoroalkyl Substances (PFAS)

		AKRF Sample ID	SW-09_17-20240123	SW-10_15_20240126	SW-11_17_20240126	SW-12_17_20240126	SW-13_15_20240126
		Laboratory Sample ID	L2403781-03	L2404670-01	L2404670-02	L2404670-03	L2404670-04
		Date Sampled	1/23/2024	1/26/2024	1/26/2024	1/26/2024	1/26/2024
		Dilution Factor	1	1	1	1	1
		Unit	ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.388 J	0.574 U	0.585 U	0.583 U	0.569 U
8:2 Fluorotelomer sulfonate	NS	NS	0.637 U	0.574 U	0.585 U	0.583 U	0.569 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.637 UJ	0.574 UJ	0.585 UJ	0.583 UJ	0.569 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.637 U	0.574 UJ	0.585 UJ	0.583 UJ	0.569 UJ
Perfluorobutanesulfonic acid	NS	NS	0.319 U	0.287 U	0.292 U	0.292 U	0.284 U
Perfluorobutanoic acid	NS	NS	0.637 UJ	0.574 U	0.585 UJ	0.583 U	0.569 UJ
Perfluorodecanesulfonic acid	NS	NS	0.637 U	0.574 U	0.585 U	0.583 U	0.569 U
Perfluorodecanoic acid	NS	NS	0.319 UJ	0.287 U	0.292 UJ	0.292 U	0.284 UJ
Perfluorododecanoic acid	NS	NS	0.637 U	0.574 U	0.585 U	0.583 U	0.569 U
Perfluoroheptanesulfonic acid	NS	NS	0.637 U	0.574 U	0.585 U	0.583 U	0.569 U
Perfluoroheptanoic acid	NS	NS	0.319 UJ	0.287 U	0.292 UJ	0.292 U	0.284 UJ
Perfluorohexanesulfonic acid	NS	NS	0.319 U	0.287 U	0.292 U	0.292 U	0.284 U
Perfluorohexanoic acid	NS	NS	0.637 UJ	0.574 U	0.585 UJ	0.583 U	0.569 UJ
Perfluorononanoic acid	NS	NS	0.319 UJ	0.287 U	0.292 UJ	0.292 U	0.284 UJ
Perfluorooctanesulfonamide	NS	NS	0.637 UJ	0.574 U	0.585 U	0.583 U	0.569 U
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.319 U	0.287 U	0.292 U	0.292 U	0.284 U
Perfluorooctanoic acid (PFOA)	0.66	33	0.154 J	0.287 U	0.292 U	0.292 U	0.284 J
Perfluoropentanoic acid	NS	NS	0.637 UJ	0.574 U	0.585 UJ	0.583 U	0.569 UJ
Perfluorotetradecanoic acid	NS	NS	0.637 U	0.574 U	0.585 U	0.583 U	0.569 U
Perfluorotridecanoic acid	NS	NS	0.637 U	0.574 U	0.585 U	0.583 U	0.569 U
Perfluoroundecanoic acid	NS	NS	0.637 U	0.574 U	0.585 UJ	0.583 U	0.569 UJ
TOTAL PFOA AND PFOS	NS	NS	0.154 J	0.051 J	0.054 J	0.292 U	0.284 J

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		AKRF Sample ID	SW-14_17_20240126	SW-15_17_20240126	SW-16_17_20240129	SW-17_17_20240131	UST-B_8_20231018
		Laboratory Sample ID	L2404670-05	L2404670-06	L2404883-01	L2405264-02	L2359390-14
		Date Sampled	1/26/2024	1/26/2024	1/29/2024	1/31/2024	10/18/2023
		Dilution Factor	1	1	1	1	1
		Unit	ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.561 U	0.585 U	0.57	0.725 U	0.57 U
8:2 Fluorotelomer sulfonate	NS	NS	0.561 U	0.585 U	0.513 U	0.725 U	0.57 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	2.21 UJ	0.585 UJ	0.513 UJ	0.725 UJ	0.57 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	2.21 UJ	0.585 UJ	0.513 UJ	0.725 UJ	0.57 UJ
Perfluorobutanesulfonic acid	NS	NS	0.28 U	0.292 U	0.256 U	0.362 U	0.285 U
Perfluorobutanoic acid	NS	NS	2.21 UJ	0.585 UJ	0.513 U	0.725 UJ	0.57 U
Perfluorodecanesulfonic acid	NS	NS	0.561 U	0.585 U	0.513 U	0.725 U	0.57 U
Perfluorodecanoic acid	NS	NS	0.28 UJ	0.292 UJ	0.256 U	0.362 UJ	0.285 U
Perfluorododecanoic acid	NS	NS	0.561 U	0.585 U	0.513 U	0.725 UJ	0.57 U
Perfluoroheptanesulfonic acid	NS	NS	0.561 U	0.585 U	0.513 U	0.725 U	0.57 U
Perfluoroheptanoic acid	NS	NS	1.1 UJ	0.292 UJ	0.256 U	0.362 UJ	0.285 U
Perfluorohexanesulfonic acid	NS	NS	0.28 U	0.292 U	0.256 U	0.362 U	0.285 U
Perfluorohexanoic acid	NS	NS	2.21 UJ	0.585 UJ	0.513 U	0.725 UJ	0.57 U
Perfluorononanoic acid	NS	NS	0.28 UJ	0.292 UJ	0.256 U	0.362 UJ	0.285 U
Perfluorooctanesulfonamide	NS	NS	0.561 U	0.585 U	0.513 U	0.725 UJ	0.57 U
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.28 U	0.292 U	0.256 U	0.362 U	0.542
Perfluorooctanoic acid (PFOA)	0.66	33	0.28 UJ	0.292 UJ	0.256 U	0.362 U	0.148 J
Perfluoropentanoic acid	NS	NS	2.21 UJ	0.585 UJ	0.513 U	0.725 UJ	0.57 U
Perfluorotetradecanoic acid	NS	NS	0.561 U	0.585 U	0.513 U	0.725 UJ	0.57 U
Perfluorotridecanoic acid	NS	NS	0.561 U	0.585 U	0.513 U	0.725 U	0.57 U
Perfluoroundecanoic acid	NS	NS	0.561 UJ	0.585 UJ	0.513 U	0.725 UJ	0.57 U
TOTAL PFOA AND PFOS	NS	NS	0.28 U	0.292 U	0.256 U	0.362 U	0.69 J

Table 7
272 4th Avenue
Brooklyn, NY
Soil Documentation Analytical Results

Per- and Polyfluoroalkyl Substances (PFAS)

AKRF Sample ID			UST-X_20231018	UST-EW_7_20231018	UST-NW_7_20231018	UST-SW_7_20231018	UST-WW_7_20231018
Laboratory Sample ID			L2359390-15	L2359390-13	L2359390-10	L2359390-11	L2359390-12
Date Sampled			10/18/2023	10/18/2023	10/18/2023	10/18/2023	10/18/2023
Dilution Factor			1	1	1	1	1
Unit			ppb	ppb	ppb	ppb	ppb
Compound	**NYSDEC UUGV**	**NYSDEC RRGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.353 J
8:2 Fluorotelomer sulfonate	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.576 UJ	0.599 UJ	0.581 UJ	0.539 UJ	0.589 UJ
N-methyl perfluorooctanesulfonamidoacetic acid	NS	NS	0.576 UJ	0.599 UJ	0.581 UJ	0.539 UJ	0.589 UJ
Perfluorobutanesulfonic acid	NS	NS	0.288 U	0.299 U	0.29 U	0.27 U	0.294 U
Perfluorobutanoic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
Perfluorodecanesulfonic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
Perfluorodecanoic acid	NS	NS	0.288 U	0.299 U	0.29 U	0.27 U	0.294 U
Perfluorododecanoic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
Perfluoroheptanesulfonic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
Perfluoroheptanoic acid	NS	NS	0.288 U	0.299 U	0.29 U	0.27 U	0.294 U
Perfluorohexanesulfonic acid	NS	NS	0.288 U	0.299 U	0.29 U	0.27 U	0.294 U
Perfluorohexanoic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
Perfluorononanoic acid	NS	NS	0.288 U	0.299 U	0.29 U	0.27 U	0.294 U
Perfluorooctanesulfonamide	NS	NS	0.576 U	0.599 U	0.581 U	0.539 UJ	0.147 J
Perfluorooctanesulfonic acid (PFOS)	**0.88**	44	0.311	0.234 J	0.29 U	0.302	0.789
Perfluorooctanoic acid (PFOA)	0.66	33	0.161 J	0.06 J	0.065 J	0.108 J	0.182 J
Perfluoropentanoic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.1 J
Perfluorotetradecanoic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
Perfluorotridecanoic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
Perfluoroundecanoic acid	NS	NS	0.576 U	0.599 U	0.581 U	0.539 U	0.589 U
TOTAL PFOA AND PFOS	NS	NS	0.472 J	0.294 J	0.065 J	0.41 J	0.971 J

Table 8
272 4th Avenue
Brooklyn, NY
Baseline Groundwater Analytical Results
Volatile Organic Compounds

AKRF Sample ID		MW-01_20240515	MW-02_20240515	MW-03_20240510	MW-X_20240510
Laboratory Sample ID		460-304130-1	460-304130-2	460-303768-1	460-303768-2
Date Sampled		5/15/2024	5/15/2024	5/10/2024	5/10/2024
Unit		µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	5	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	5	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	5	1 U	1 U	1 U	1 U
1,2-Dibromo-3-Chloropropane	0.04	1 U	1 U	1 U	1 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0006	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	3	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.6	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	3	NR	NR	NR	NR
1,4-Dichlorobenzene	3	1 U	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U
Acetone	**50**	**79**	5 U	5 U	5 U
Benzene	1	0.25 J	1 U	1 U	1 U
Bromochloromethane	5	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U
Chlorobenzene	5	0.72 J	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U
Chloroform	7	1 U	1 U	1 U	1 U
Chloromethane	5	1 U	1 U	1 UJ	1 UJ
Cis-1,2-Dichloroethylene	5	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Cyclohexane	NS	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	5	1 U	1 U	1 UJ	1 UJ
Ethylbenzene	5	0.91 J	1 U	1 U	1 U
Isopropylbenzene (Cumene)	5	1 U	1 U	1 U	1 U
M,P-Xylenes	5	2.5	1 U	1 U	1 U
Methyl Acetate	NS	5 U	5 U	5 U	5 U
Methyl Ethyl Ketone (2-Butanone)	50	28	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	1.6 J	5 U	5 U	5 U
Methylcyclohexane	NS	1 U	1 U	1 U	1 U
Methylene Chloride	5	1.8	1 U	1 U	1 U
O-Xylene (1,2-Dimethylbenzene)	5	2.3	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U
Tert-Butyl Methyl Ether	10	0.64 J	1.2	1 U	1 U
Tetrachloroethylene (PCE)	5	0.28 J	1 U	1 U	1 U
Toluene	**5**	**5.7**	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	5	1 U	1 U	1 U	1 U
Trichlorofluoromethane	5	1 U	1 U	1 U	1 U
Vinyl Chloride	2	1 U	1 U	1 U	1 U

Table 8
272 4th Avenue
Brooklyn, NY
Baseline Groundwater Analytical Results

Volatile Organic Compounds

AKRF Sample ID		FB-01-GW_20240510	TB-01-GW_20240510
Laboratory Sample ID		460-303768-3	460-303768-4
Date Sampled		5/10/2024	5/10/2024
Unit		µg/L	µg/L
Dilution Factor		1	1
Compound	**AWQSGV**	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	5	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U
1,2,3-Trichlorobenzene	5	1 U	1 U
1,2,4-Trichlorobenzene	5	1 U	1 U
1,2-Dibromo-3-Chloropropane	0.04	1 U	1 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0006	1 U	1 U
1,2-Dichlorobenzene	3	1 U	1 U
1,2-Dichloroethane	0.6	1 U	1 U
1,2-Dichloropropane	1	1 U	1 U
1,3-Dichlorobenzene	3	1 U	1 U
1,4-Dichlorobenzene	3	1 U	1 U
2-Hexanone	50	5 U	5 U
Acetone	**50**	5 U	5 U
Benzene	1	1 U	1 U
Bromochloromethane	5	1 U	1 U
Bromodichloromethane	50	1 U	1 U
Bromoform	50	1 U	1 U
Bromomethane	5	1 U	1 U
Carbon Disulfide	60	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U
Chlorobenzene	5	1 U	1 U
Chloroethane	5	1 U	1 U
Chloroform	7	1 U	1 U
Chloromethane	5	1 UJ	1 UJ
Cis-1,2-Dichloroethylene	5	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U
Cyclohexane	NS	1 U	1 U
Dibromochloromethane	50	1 U	1 U
Dichlorodifluoromethane	5	1 UJ	1 UJ
Ethylbenzene	5	1 U	1 U
Isopropylbenzene (Cumene)	5	1 U	1 U
M,P-Xylenes	5	1 U	1 U
Methyl Acetate	NS	5 U	5 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U
Methylcyclohexane	NS	1 U	1 U
Methylene Chloride	5	1 U	1 U
O-Xylene (1,2-Dimethylbenzene)	5	1 U	1 U
Styrene	5	1 U	1 U
Tert-Butyl Methyl Ether	10	1 U	1 U
Tetrachloroethylene (PCE)	5	1 U	1 U
Toluene	**5**	1 U	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U
Trichloroethylene (TCE)	5	1 U	1 U
Trichlorofluoromethane	5	1 U	1 U
Vinyl Chloride	2	1 U	1 U

Table 9
272 4th Avenue
Brooklyn, NY
Remedial Investigation Soil Vapor, Indoor Air, and Ambient Air Analytical Results

Volatile Organic Compounds

Sample ID	SV-01_20190119	SV-04_20190119	SV-5_20190210	SV-5_20190210	SV-8_20190210	SV-11_20190209	SV-12_20190209
Lab Sample ID	L1902686-01	L1902686-02	L1905447-01	L1905447-01	L1905447-02	L1905447-03	L1905447-04
Date Sampled	1/19/2019	1/19/2019	2/10/2019	2/10/2019	2/10/2019	2/09/2019	2/09/2019
Lot	23	23	23	23	23	23	23
Unit	μg/m^3	μg/m^3	μg/m^3	μg/m^3	μg/m^3	μg/m^3	μg/m^3
Dilution Factor	5	5	2	5	86.51	1	1
Compound	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5.46 U	5.46 U	2.18 U	NR	94.4 U	1.09 U	1.09 U
1,1,2,2-Tetrachloroethane	6.87 U	6.87 U	2.75 U	NR	119 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	7.66 U	7.66 U	3.07 U	NR	133 U	1.53 U	1.53 U
1,1,2-Trichloroethane	5.46 U	5.46 U	2.18 U	NR	94.4 U	1.09 U	1.09 U
1,1-Dichloroethane	4.05 U	4.05 U	1.62 U	NR	70 U	0.809 U	0.809 U
1,1-Dichloroethene	3.96 U	3.96 U	1.59 U	NR	68.6 U	0.793 U	0.793 U
1,2,4-Trichlorobenzene	7.42 UJ	7.42 UJ	2.97 U	NR	128 U	1.48 U	2.19
1,2,4-Trimethylbenzene	9.09	4.92 U	26.4	NR	551	30.7	150
1,2-Dibromoethane (Ethylene Dibromide)	7.69 U	7.69 U	3.07 U	NR	133 U	1.54 U	1.54 U
1,2-Dichlorobenzene	6.01 U	6.01 U	2.4 U	NR	104 U	1.2 U	155
1,2-Dichloroethane	4.05 U	4.05 U	2.6	NR	70 U	0.809 U	0.809 U
1,2-Dichloropropane	4.62 U	4.62 U	1.85 U	NR	80 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	6.99 U	6.99 U	2.8 U	NR	121 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	6.49	4.92 U	12.1	NR	683	11.7	66.9
1,3-Butadiene	2.21 U	2.21 U	3.34	NR	38.3 U	0.442 U	0.442 U
1,3-Dichlorobenzene	6.01 U	6.01 U	2.4 U	NR	104 U	4.25	10.4
1,4-Dichlorobenzene	6.01 U	6.01 U	2.4 U	NR	104 U	1.2 U	21.3
2,2,4-Trimethylpentane	4.67 U	4.67 U	120	NR	26,200	1.54	2.1
2-Hexanone	4.1 U	4.1 U	1.64 U	NR	70.9 U	0.82 U	3.82
4-Ethyltoluene	4.92 U	4.92 U	8.31	NR	258	7.96	30.3
Acetone	115	55.1	1,490	NR	603	50.6	337
Allyl Chloride (3-Chloropropene)	3.13 U	3.13 U	1.25 U	NR	54.2 U	0.626 U	0.626 U
Benzene	3.58	8.05	81.8	NR	286	4.7	3.67
Benzyl Chloride	5.18 U	5.18 U	2.07 U	NR	89.6 U	1.04 U	1.04 U
Bromodichloromethane	6.7 U	6.7 U	2.68 U	NR	116 U	1.34 U	1.34 U
Bromoform	10.3 U	10.3 U	4.14 U	NR	179 U	2.07 U	2.07 U
Bromomethane	3.88 U	3.88 U	1.55 U	NR	67.2 U	0.777 U	0.777 U
Carbon Disulfide	69.8	23.7	13.4	NR	53.9 U	15.5	24.3
Carbon Tetrachloride	6.29 U	6.29 U	2.52 U	NR	109 U	1.26 U	1.26 U
Chlorobenzene	4.61 U	4.61 U	1.84 U	NR	79.7 U	0.921 U	0.921 U
Chloroethane	2.64 U	2.64 U	1.06 U	NR	45.7 U	0.528 U	0.528 U
Chloroform	4.88 U	300	1.95 U	NR	84.5 U	0.977 U	5.62
Chloromethane	2.07 U	2.07 U	0.826 U	NR	35.7 U	0.413 U	0.413 U
Cis-1,2-Dichloroethylene	3.96 U	3.96 U	1.59 U	NR	68.6 U	0.793 U	0.793 U
Cis-1,3-Dichloropropene	4.54 U	4.54 U	1.82 U	NR	78.5 U	0.908 U	0.908 U
Cyclohexane	3.44 U	3.44 U	49.2	NR	2,980	3.72	3.29
Dibromochloromethane	8.52 U	8.52 U	3.41 U	NR	147 U	1.7 U	1.7 U
Dichlorodifluoromethane	7.91	4.94 U	2.85	NR	85.5 U	4.16	2.59
Dichloroethylenes	3.96 U	3.96 U	1.59 U	NR	68.6 U	0.793 U	0.793 U
Ethanol	47.1 U	47.1 U	NR	2,860 D	814 U	12.4	108
Ethyl Acetate	9.01 U	9.01 U	3.6 U	NR	156 U	1.8 U	1.8 U
Ethylbenzene	4.34 U	4.34 U	168	NR	1,860	137	198
Hexachlorobutadiene	10.7 U	10.7 U	4.27 U	NR	185 U	2.13 U	2.13 U
Isopropanol	8.06	6.15 U	96.8	NR	106 U	1.23 U	14.4
M,P-Xylenes	8.69 U	8.69 U	786	NR	5,170	639	869
Methyl Ethyl Ketone (2-Butanone)	14.9	7.37 U	192	NR	127 U	6.67	84.1
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	10.2 U	10.2 U	36.1	NR	177 U	2.05 U	11.8
Methylene Chloride	8.69 U	8.69 U	3.47 U	NR	150 U	1.74 U	35.4
N-Heptane	4.1 U	4.1 U	127	NR	5,860	14.3	7.95
N-Hexane	3.81	3.52 U	116	NR	6,310	8.21	4.83
O-Xylene (1,2-Dimethylbenzene)	4.34 U	4.34 U	148	NR	2,590	73.4	130
Styrene	4.26 U	4.26 U	1.75	NR	73.7 U	0.852 U	0.852 U
Tert-Butyl Alcohol	17.4	7.58 U	37.3	NR	131 U	3.79	21.9
Tert-Butyl Methyl Ether	3.61 U	3.61 U	1.44 U	NR	62.4 U	0.721 U	0.721 U
Tetrachloroethylene (PCE)	1,720	1,890	78.7	NR	7,120	190	369
Tetrahydrofuran	7.37 U	7.37 U	2.95 U	NR	127 U	1.47 U	1.47 U
Toluene	13	5.62	165	NR	7,240	18.2	39.6
Total, 1,3-Dichloropropene (Cis And Trans)	4.54 U	4.54 U	1.82 U	NR	78.5 U	0.908 U	0.908 U
Trans-1,2-Dichloroethene	3.96 U	3.96 U	1.59 U	NR	68.6 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	4.54 U	4.54 U	1.82 U	NR	78.5 U	0.908 U	0.908 U
Trichloroethylene (TCE)	14.1	103	4.13	NR	372	1.07 U	4.75
Trichlorofluoromethane	5.62 U	5.62 U	2.25 U	NR	97.2 U	2.1	1.35
Vinyl Bromide	4.37 U	4.37 U	1.75 U	NR	75.6 U	0.874 U	0.874 U
Vinyl Chloride	2.56 U	2.56 U	1.02 U	NR	44.2 U	0.511 U	0.511 U
Xylenes, Total	4.34 U	4.34 U	934	NR	7,730	712	999

Table 9
272 4th Avenue
Brooklyn, NY
Remedial Investigation Soil Vapor, Indoor Air, and Ambient Air Analytical Results
Volatile Organic Compounds

Sample ID	AA-01_20190119	RI-SV-01_20200922	RI-SV-02_20200923	RI-SV-03_20200922	RI-SV-04_20200922	RI-SV-05_20200921	RI-SV-06_20200921
Lab Sample ID	L1902686-03	L2039917-04	L2039917-10	L2039917-06	L2039917-08	L2039917-01	L2039917-02
Date Sampled	1/19/2019	9/22/2020	9/23/2020	9/22/2020	9/22/2020	9/21/2020	9/21/2020
Lot	23	23	23	23	23	23	23
Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Dilution Factor	1	3.333	1.429	2	1	6.25	4.167
Compound	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	1.09 U	3.64 U	1.56 U	2.25	1.09 U	6.82 U	4.54 U
1,1,2,2-Tetrachloroethane	1.37 U	4.58 U	1.96 U	2.75 U	1.37 U	8.58 U	5.72 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	1.53 U	5.11 U	2.19 U	3.07 U	1.53 U	9.58 U	6.38 U
1,1,2-Trichloroethane	1.09 U	3.64 U	1.56 U	2.18 U	1.09 U	6.82 U	4.54 U
1,1-Dichloroethane	0.809 U	2.7 U	1.16 U	1.62 U	0.809 U	5.06 U	3.37 U
1,1-Dichloroethene	0.793 U	2.64 U	1.13 U	1.59 U	0.793 U	4.96 U	3.3 U
1,2,4-Trichlorobenzene	1.48 UJ	4.95 U	2.12 U	2.97 U	1.48 U	9.28 U	6.18 U
1,2,4-Trimethylbenzene	0.983 U	16.4	23	17.8	22.2	14	12
1,2-Dibromoethane (Ethylene Dibromide)	1.54 U	5.13 U	2.2 U	3.07 U	1.54 U	9.61 U	6.4 U
1,2-Dichlorobenzene	1.2 U	4.01 U	1.72 U	2.4 U	1.2 U	7.52 U	5.01 U
1,2-Dichloroethane	0.809 U	2.7 U	1.16 U	1.62 U	0.809 U	5.06 U	3.37 U
1,2-Dichloropropane	0.924 U	3.08 U	1.32 U	1.85 U	0.924 U	5.78 U	3.85 U
1,2-Dichlorotetrafluoroethane	1.4 U	4.66 U	2 U	2.8 U	1.4 U	8.74 U	5.82 U
1,3,5-Trimethylbenzene (Mesitylene)	0.983 U	4.33	5.95	4.65	5.51	6.15 U	4.1 U
1,3-Butadiene	0.442 U	1.48 U	0.633 U	2.9	0.442 U	3.96	1.84 U
1,3-Dichlorobenzene	1.2 U	4.01 U	1.72 U	2.4 U	1.2 U	7.52 U	5.01 U
1,4-Dichlorobenzene	1.2 U	4.01 U	1.72 U	2.4 U	1.2 U	7.52 U	5.01 U
2,2,4-Trimethylpentane	0.934 U	10.2	5.37	6.07	4.51	5.84 U	11.2
2-Hexanone	0.82 U	2.73 U	6.15	1.64 U	2.91	171	63.1
4-Ethyltoluene	0.983 U	4.45	4.45	4.64	6.19	6.15 U	4.1 U
Acetone	5.23	51.8	3.99	17.2	23.3	144	90
Allyl Chloride (3-Chloropropene)	0.626 U	2.09 U	0.895 U	1.25 U	0.626 U	3.91 U	2.61 U
Benzene	0.764	4.38	4.12	7.48	4.41	1,140	7.51
Benzyl Chloride	1.04 U	3.45 U	1.48 U	2.07 U	1.04 U	6.47 U	4.31 U
Bromodichloromethane	1.34 U	4.47 U	1.92 U	2.68 U	1.34 U	8.37 U	5.58 U
Bromoform	2.07 U	6.9 U	2.96 U	4.14 U	2.07 U	12.9 U	8.61 U
Bromomethane	0.777 U	2.59 U	1.11 U	1.55 U	0.777 U	4.85 U	3.23 U
Carbon Disulfide	0.623 U	2.34	2.09	2.44	0.638	5.29	5.98
Carbon Tetrachloride	1.26 U	4.2 U	1.8 U	2.52 U	1.26 U	7.86 U	5.24 U
Chlorobenzene	0.921 U	3.07 U	1.32 U	2.17	0.921 U	5.76 U	3.84 U
Chloroethane	0.528 U	1.76 U	0.755 U	1.06 U	0.528 U	3.3 U	2.2 U
Chloroform	0.977 U	21.3	1.52	43.3	3.53	6.1 U	4.07 U
Chloromethane	1.08	1.38 U	0.591 U	0.826 U	0.413 U	2.58 U	1.72 U
Cis-1,2-Dichloroethylene	0.793 U	2.64 U	1.13 U	4.76	0.793 U	4.96 U	3.3 U
Cis-1,3-Dichloropropene	0.908 U	3.03 U	1.3 U	1.82 U	0.908 U	5.67 U	3.78 U
Cyclohexane	0.688 U	4.37	2.48	2.79	2.13	28.3	3.96
Dibromochloromethane	1.7 U	5.68 U	2.44 U	3.41 U	1.7 U	10.6 U	7.1 U
Dichlorodifluoromethane	2.69	3.3 U	3.38	2.48	2.4	6.18 U	4.12 U
Dichloroethylenes	0.793 U	NR	NR	NR	NR	NR	NR
Ethanol	9.42	31.5 U	13.5 U	24.3	29	66.9	56.9
Ethyl Acetate	1.8 U	6.02 U	2.57 U	3.6 U	1.8 U	11.2 U	7.5 U
Ethylbenzene	0.869 U	12.1	15.4	13.5	14	25	18.9
Hexachlorobutadiene	2.13 U	7.11 U	3.05 U	4.27 U	2.13 U	13.3 U	8.89 U
Isopropanol	1.49	4.1 U	1.76 U	2.75	3.22	7.67 U	5.11 U
M,P-Xylenes	1.74 U	45.2	55.6	49.1	53	105	63
Methyl Ethyl Ketone (2-Butanone)	1.47 U	7.11	30.7	7.55	12.6	1,090	767
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.05 U	6.84 U	2.93 U	4.1 U	2.82	12.8 U	8.52 U
Methylene Chloride	1.74 U	5.8 U	2.48 U	3.47 U	1.74 U	10.8 U	7.23 U
N-Heptane	0.82 U	7.54	12	11.8	10.6	196	12
N-Hexane	0.705 U	4.58	7.75	11	7.51	65.6	10.2
O-Xylene (1,2-Dimethylbenzene)	0.869 U	14.4	19	16.1	17.3	35.2	20.9
Styrene	0.852 U	2.84 U	1.63	1.7 U	1.68	5.32 U	3.55 U
Tert-Butyl Alcohol	1.52 U	5.06 U	2.16 U	3.03 U	1.52 U	9.46 U	6.31 U
Tert-Butyl Methyl Ether	0.721 U	2.4 U	1.03 U	1.44 U	0.721 U	4.51 U	3 U
Tetrachloroethylene (PCE)	1.36 U	1,270	546	773	2.24	23.2	168
Tetrahydrofuran	1.47 U	4.93 U	2.11 U	2.95 U	1.47 U	9.2 U	6.13 U
Toluene	1.12	37.2	51.6	41.8	42.2	712	41.8
Total, 1,3-Dichloropropene (Cis And Trans)	0.908 U	NR	NR	NR	NR	NR	NR
Trans-1,2-Dichloroethene	0.793 U	2.64 U	1.13 U	1.59 U	0.793 U	4.96 U	3.3 U
Trans-1,3-Dichloropropene	0.908 U	3.03 U	1.3 U	1.82 U	0.908 U	5.67 U	3.78 U
Trichloroethylene (TCE)	1.49	53.1	4.56	109	1.07 U	6.72 U	4.48 U
Trichlorofluoromethane	1.47	3.75 U	1.61 U	2.25 U	1.12 U	7.02 U	4.68 U
Vinyl Bromide	0.874 U	2.92 U	1.25 U	1.75 U	0.874 U	5.47 U	3.64 U
Vinyl Chloride	0.511 U	1.71 U	0.731 U	1.02 U	0.511 U	3.2 U	2.13 U
Xylenes, Total	0.869 U	NR	NR	NR	NR	NR	NR

Table 9
272 4th Avenue
Brooklyn, NY
Remedial Investigation Soil Vapor, Indoor Air, and Ambient Air Analytical Results

Volatile Organic Compounds

Sample ID	RI-IA-01_20200922	RI-IA-02_20200923	RI-IA-03_20200922	RI-IA-04_20200922	RI-AA-01_20200921	SV-01_20210413	SV-02_20210413
Lab Sample ID	L2039917-05	L2039917-11	L2039917-07	L2039917-09	L2039917-03	L2118701-01	L2118701-02
Date Sampled	9/22/2020	9/23/2020	9/22/2020	9/22/2020	9/21/2020	4/13/2021	4/13/2021
Lot	23	23	23	23	23	17	17
Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Dilution Factor	1	1	1	1	1	1	4.167
Compound	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	1.09 U	7.91
1,1,2,2-Tetrachloroethane	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	5.72 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	6.38 U
1,1,2-Trichloroethane	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	4.54 U
1,1-Dichloroethane	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	3.37 U
1,1-Dichloroethene	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.793 U	3.3 U
1,2,4-Trichlorobenzene	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	6.18 U
1,2,4-Trimethylbenzene	7.72	11.2	27.5	3.01	0.983 U	12.8	16
1,2-Dibromoethane (Ethylene Dibromide)	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	6.4 U
1,2-Dichlorobenzene	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	5.01 U
1,2-Dichloroethane	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	3.37 U
1,2-Dichloropropane	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.961	3.85 U
1,2-Dichlorotetrafluoroethane	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	5.82 U
1,3,5-Trimethylbenzene (Mesitylene)	1.97	2.68	10	0.983 U	0.983 U	3.52	10.8
1,3-Butadiene	1.42	0.666	0.659	0.442 U	0.442 U	0.442 U	1.84 U
1,3-Dichlorobenzene	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	5.01 U
1,4-Dichlorobenzene	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	5.01 U
2,2,4-Trimethylpentane	9.67	6.12	7.99	3.89	1.14	0.934 U	3.89 U
2-Hexanone	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.975	3.41 U
4-Ethyltoluene	1.09	2.06	8.85	0.983 U	0.983 U	2.82	5.56
Acetone	50.6	138	25.4	15.6	10.7	39.7	168
Allyl Chloride (3-Chloropropene)	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	2.61 U
Benzene	4.15	4.34	9.46	1.76	0.821	1.34	67.7
Benzyl Chloride	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 UJ	4.31 UJ
Bromodichloromethane	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	5.58 U
Bromoform	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	8.61 U
Bromomethane	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	3.23 U
Carbon Disulfide	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	1.44	16.7
Carbon Tetrachloride	0.421	0.377	0.396	0.352	0.447	1.26 U	5.24 U
Chlorobenzene	0.921 U	0.921 U	62.2	0.921 U	0.921 U	0.921 U	3.84 U
Chloroethane	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	2.2 U
Chloroform	0.977 U	0.977 U	1.48	0.977 U	0.977 U	20.6	18.2
Chloromethane	0.805	0.789	0.793	0.803	0.797	0.413 U	1.72 U
Cis-1,2-Dichloroethylene	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.793 U	3.3 U
Cis-1,3-Dichloropropene	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	3.78 U
Cyclohexane	4.03	1.97	5.71	8.64	0.688 U	0.688 U	4.41
Dibromochloromethane	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	7.1 U
Dichlorodifluoromethane	2.13	1.68	2.14	1.59	2.12	2.17	4.12 U
Dichloroethylenes	NR	NR	NR	NR	NR	NR	NR
Ethanol	56.5	57.1	55.2	133	13.9	9.42 U	39.2 U
Ethyl Acetate	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	7.5 U
Ethylbenzene	5.6	5.52	8.21	1.95	0.869 U	5.82	217
Hexachlorobutadiene	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	8.89 U
Isopropanol	12.8	23.5	5.24	8.9	2.26	1.23 U	6.54
M,P-Xylenes	19.6	20.8	78.2	6.43	2.45	21.6	539
Methyl Ethyl Ketone (2-Butanone)	1.79	2.61	1.47 U	1.47 U	1.47 U	3.27	23.2
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.05 U	38.1	2.05 U	2.05 U	2.05 U	2.05 U	24.8
Methylene Chloride	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	3.21	7.23 U
N-Heptane	4.92	5.98	4.3	2.93	0.82 U	3.08	46.3
N-Hexane	5.74	3.67	2.63	1.3	0.705 U	5.36	18.5
O-Xylene (1,2-Dimethylbenzene)	5.82	6.99	14.5	2.08	0.869 U	9.12	189
Styrene	1.64	4.51	0.852 U	0.852 U	0.852 U	0.852 U	3.55 U
Tert-Butyl Alcohol	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.54	6.31 U
Tert-Butyl Methyl Ether	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	3 U
Tetrachloroethylene (PCE)	0.515	0.671	7.39	0.298	0.19	18.4	103
Tetrahydrofuran	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	6.13 U
Toluene	81	43.3	84	36.9	12.2	24.4	153
Total, 1,3-Dichloropropene (Cis And Trans)	NR	NR	NR	NR	NR	NR	NR
Trans-1,2-Dichloroethene	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	3.3 U
Trans-1,3-Dichloropropene	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	3.78 U
Trichloroethylene (TCE)	0.107 U	0.107 U	0.29	0.107 U	0.107 U	1.07 U	4.48 U
Trichlorofluoromethane	1.12 U	1.12 U	1.13	1.12 U	1.12 U	1.87	4.68 U
Vinyl Bromide	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	3.64 U
Vinyl Chloride	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.511 U	2.13 U
Xylenes, Total	NR	NR	NR	NR	NR	NR	NR

Table 9
272 4th Avenue
Brooklyn, NY
Remedial Investigation Soil Vapor, Indoor Air, and Ambient Air Analytical Results

Volatile Organic Compounds

Sample ID	SV-03_20210413	SV-04_20210413	RI-SV-07_20211122	RI-SV-08_20211122	RI-SV-09_20211122	RI-AA-02_20211122	AA-01_20210413
Lab Sample ID	L2118701-03	L2118701-04	L2164582-02	L2164582-03	L2164582-04	L2164582-01	L2118701-07
Date Sampled	4/13/2021	4/13/2021	11/22/2021	11/22/2021	11/22/2021	11/22/2021	4/13/2021
Lot	17	17	17	17	17	17	17
Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Dilution Factor	1	1.667	1	1	1	1	1
Compound	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	1.09 U	5.84	1.33	2.48	0.988 J	1.09 U	1.09 U
1,1,2,2-Tetrachloroethane	1.37 U	2.29 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	1.53 U	2.55 U	0.529 J	1.53 U	1.53 U	0.544 J	1.53 U
1,1,2-Trichloroethane	1.09 U	1.82 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	0.809 U	1.35 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,1-Dichloroethene	0.793 U	1.32 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
1,2,4-Trichlorobenzene	1.48 U	2.47 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	15.9	13.8	13.2	10.1	9.44	1.5	5.21
1,2-Dibromoethane (Ethylene Dibromide)	1.54 U	2.56 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	1.2 U	2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	0.809 U	1.35 U	0.87	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	0.924 U	1.54 U	1.73	0.924 U	3.09	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	1.4 U	2.33 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	4.42	3.85	3.95	2.4	3.4	0.433 J	1.21
1,3-Butadiene	0.442 U	0.737 U	0.892	0.617	0.741	0.739	0.442 U
1,3-Dichlorobenzene	1.2 U	2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	1.2 U	2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
2,2,4-Trimethylpentane	1.66	1.56 U	3.83	1.56	5.75	0.719 J	1.25
2-Hexanone	0.82 U	1.36 U	8.97	0.82 U	1.33	0.82 U	0.82 U
4-Ethyltoluene	3.38	2.65	2.95	2.28	1.24	0.349 J	0.983 U
Acetone	58.9	6.46	1,000	17.5	38	10.1	122
Allyl Chloride (3-Chloropropene)	0.626 U	1.04 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	4.19	1.06 U	5.46	1.2	3.64	2.4	1.19
Benzyl Chloride	1.04 UJ	1.72 UJ	1.04 U	1.04 U	1.04 U	1.04 U	1.04 UJ
Bromodichloromethane	1.34 U	2.23 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoform	2.07 U	3.44 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	0.777 U	1.29 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	9.78	1.46	3.18	1.67	5.54	0.623 U	0.623 U
Carbon Tetrachloride	1.26 U	2.09 U	1.26 U	1.26 U	1.94	0.591 J	1.26 U
Chlorobenzene	0.921 U	1.53 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	0.528 U	0.879 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	0.977 U	1.63 U	6.35	1.82	0.816 J	0.977 U	0.977 U
Chloromethane	0.413 U	0.688 U	0.413 U	0.299 J	0.314 J	0.987	1.16
Cis-1,2-Dichloroethylene	0.793 U	1.32 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
Cis-1,3-Dichloropropene	0.908 U	1.51 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	4.06	1.15 U	2.98	3.13	3.41	0.482 J	1.06
Dibromochloromethane	1.7 U	2.84 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	3.75	3.04	2.82	4.66	3.43	2.45	1.82
Dichloroethylenes	NR	NR	NR	NR	NR	NR	NR
Ethanol	9.42 U	15.7 U	22	3.88 J	6.07 J	16.9	32.8
Ethyl Acetate	1.8 U	3.01 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Ethylbenzene	6.6	4.31	6.34	3.41	3.28	0.934	6.86
Hexachlorobutadiene	2.13 U	3.55 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Isopropanol	3.54	2.05 U	26.5	1.23 U	1.23 U	1.97	5.6
M,P-Xylenes	25.7	18.2	21.9	12.1	9.86	3.34	26.5
Methyl Ethyl Ketone (2-Butanone)	14	2.46 U	76.7	3.07	3.33	3.6	12.5
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	3.18	3.42 U	14.3	2.05 U	1.22 J	2.05 U	2.05 U
Methylene Chloride	1.74 U	2.9 U	9.41	1.74 U	11.6	0.82 J	2.87
N-Heptane	89.7	1.9	7.62	4.18	5.98	0.758 J	4.92
N-Hexane	153	1.28	5.53	3.59	9.45	0.811	1.53
O-Xylene (1,2-Dimethylbenzene)	10.6	7.21	8.95	5.52	5.21	1.21	7.04
Styrene	0.852 U	1.42 U	0.873	0.852 U	0.852 U	0.217 J	2.5
Tert-Butyl Alcohol	2.63	2.53 U	12.3	1.15 J	3.76	1.52 U	1.52 U
Tert-Butyl Methyl Ether	0.721 U	1.2 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Tetrachloroethylene (PCE)	78	678	176	197	106	2.43	1.76
Tetrahydrofuran	1.47 U	2.46 U	1.47 U	1.47 U	0.348 J	0.554 J	1.47 U
Toluene	27.7	14.3	34.3	8.55	9.31	3.96	204
Total, 1,3-Dichloropropene (Cis And Trans)	NR	NR	NR	NR	NR	NR	NR
Trans-1,2-Dichloroethene	0.793 U	1.32 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	0.908 U	1.51 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichloroethylene (TCE)	1.07 U	1.79 U	2.91	1.07 U	0.672 J	1.07 U	1.07 U
Trichlorofluoromethane	1.12 U	1.87 U	1.78	1.75	1.69	1.46	1.12 U
Vinyl Bromide	0.874 U	1.46 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U
Vinyl Chloride	0.511 U	0.851 U	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U
Xylenes, Total	NR	NR	NR	NR	NR	NR	NR

Table 9
272 4th Avenue
Brooklyn, NY

Remedial Investigation Soil Vapor, Indoor Air, and Ambient Air Analytical Results

Volatile Organic Compounds

Sample ID	SV-05_20210413	SV-06_20210413	RI-SV-10_20211123
Lab Sample ID	L2118701-05	L2118701-06	L2164582-05
Date Sampled	4/13/2021	4/13/2021	11/23/2021
Lot	13	13	13
Unit	μg/m^3	μg/m^3	μg/m^3
Dilution Factor	4.167	1	1
Compound	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	4.54 U	1.09 U	1.09 U
1,1,2,2-Tetrachloroethane	5.72 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	6.38 U	1.53 U	1.53 U
1,1,2-Trichloroethane	4.54 U	1.09 U	1.09 U
1,1-Dichloroethane	3.37 U	0.809 U	0.809 U
1,1-Dichloroethene	3.3 U	0.793 U	0.793 U
1,2,4-Trichlorobenzene	6.18 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	93.9	77.7	13
1,2-Dibromoethane (Ethylene Dibromide)	6.4 U	1.54 U	1.54 U
1,2-Dichlorobenzene	5.01 U	1.2 U	1.2 U
1,2-Dichloroethane	3.37 U	0.809 U	0.809 U
1,2-Dichloropropane	3.85 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	5.82 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	24.4	20	3.51
1,3-Butadiene	1.84 U	0.684	0.5
1,3-Dichlorobenzene	5.01 U	1.2 U	1.2 U
1,4-Dichlorobenzene	5.01 U	1.2 U	1.2 U
2,2,4-Trimethylpentane	3.89 U	9.34	1.47
2-Hexanone	5.61	11.2	0.82 U
4-Ethyltoluene	19.9	18	2.48
Acetone	22	41.8	50.4
Allyl Chloride (3-Chloropropene)	2.61 U	0.626 U	0.626 U
Benzene	12.2	12.5	1.92
Benzyl Chloride	4.31 UJ	1.04 UJ	1.04 U
Bromodichloromethane	5.58 U	1.34 U	1.34 U
Bromoform	8.61 U	2.07 U	2.07 U
Bromomethane	3.23 U	0.777 U	0.777 U
Carbon Disulfide	17.1	2.2	4.55
Carbon Tetrachloride	5.24 U	1.26 U	1.26 U
Chlorobenzene	3.84 U	0.921 U	0.921 U
Chloroethane	2.2 U	0.528 U	0.528 U
Chloroform	4.07 U	2.52	0.474 J
Chloromethane	1.72 U	0.413 U	0.413 U
Cis-1,2-Dichloroethylene	3.3 U	0.793 U	0.793 U
Cis-1,3-Dichloropropene	3.78 U	0.908 U	0.908 U
Cyclohexane	6.4	4.41	1.68
Dibromochloromethane	7.1 U	1.7 U	1.7 U
Dichlorodifluoromethane	4.12 U	2.03	2.49
Dichloroethylenes	NR	NR	NR
Ethanol	2,830	114	41.5
Ethyl Acetate	7.5 U	18.5	1.8 U
Ethylbenzene	30.8	27.5	4.34
Hexachlorobutadiene	8.89 U	2.13 U	2.13 U
Isopropanol	5.11 U	5.85	1.62
M,P-Xylenes	126	111	16.4
Methyl Ethyl Ketone (2-Butanone)	16	110	7.85
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	8.52 U	7.95	0.82 J
Methylene Chloride	7.23 U	1.74 U	0.598 J
N-Heptane	63.5	53.7	4.08
N-Hexane	19.5	21.5	4.62
O-Xylene (1,2-Dimethylbenzene)	48.2	41	7.12
Styrene	3.55 U	0.852 U	0.285 J
Tert-Butyl Alcohol	6.31 U	4.52	1.71
Tert-Butyl Methyl Ether	3 U	0.721 U	0.721 U
Tetrachloroethylene (PCE)	7.26	57.7	3.36
Tetrahydrofuran	6.13 U	1.6	0.46 J
Toluene	91.2	90.4	11.7
Total, 1,3-Dichloropropene (Cis And Trans)	NR	NR	NR
Trans-1,2-Dichloroethene	3.3 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	3.78 U	0.908 U	0.908 U
Trichloroethylene (TCE)	4.48 U	1.07 U	1.07 U
Trichlorofluoromethane	4.68 U	1.12 U	1.33
Vinyl Bromide	3.64 U	0.874 U	0.874 U
Vinyl Chloride	2.13 U	0.511 U	0.511 U
Xylenes, Total	NR	NR	NR

Tables 1-9
272 4th Avenue
Brooklyn, NY
Notes

DEFINITIONS

H :	Sample result is estimated and biased high.
J :	The concentration given is an estimated value.
L :	Sample result is estimated and biased low.
NR :	Not reported.
NS :	No standard.
R :	Indicates that a quality control parameter has exceeded laboratory limits.
U :	The analyte was not detected at the indicated concentration.
UJ :	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise
mg/kg :	milligrams per kilogram
ppb :	parts per billion
µg/L :	micrograms per liter
µg/m^3 :	micrograms per cubic meter of air

STANDARDS

Part 375 Soil Cleanup Objectives :	Soil Cleanup Objectives listed in New York State Department of Environmental Conservation (NYSDEC) "Part 375" Regulations [6 New York Codes, Rules and Regulations (NYCRR) Part 375].

Exceedances of Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs) are highlighted in bold font.
Exceedances of Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs) are highlighted in gray shading.
Exceedances of Part 375 Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) are highlighted with an underline.

NYSDEC Part 375 PFAS Guidance Values :	New York State Department of Environmental Conservation (NYSDEC) Sampling, Analysis and Assessment Of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC’s Part 375 Remedial Programs Issued April 2023.

Exceedances of NYSDEC PFAS Unrestricted Use Guidance Values (UUGVs) are highlighted in bold font.
Exceedances of NYSDEC PFAS Restricted Residential Guidance Values (RRGVs) are highlighted in gray shading.

NYSDEC Class GA AWQSGVs :	New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (1.1.1): Class GA Ambient Water Quality Standards and Guidance Values (AWQSGVs).

Exceedances of NYSDEC Class GA AWQSGVs are highlighted in bold font.

DUPLICATES

X-17_20240123 is a blind duplicate of sample SW-07_17_20240117
UST-X_20231018 is a blind duplicate of sample UST-B_8_20231018
MW-X_20240510 is a blind duplicate of sample MW-03_20240510

APPENDIX A
ENVIRONMENTAL EASEMENT

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

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

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RECORDING AND ENDORSEMENT COVER PAGE

PAGE 1 OF 12

Document ID: 2024071600327001
Document Date: 07-08-2024
Preparation Date: 07-16-2024
Document Type: EASEMENT
Document Page Count: 11

PRESENTER:
SIVE PAGET & RIESEL, P.C.
560 LEXINGTON AVENUE, 15TH FLOOR
NEW YORK, NY 10022
212-421-2150
NDUNCAN@SPRLAW.COM

RETURN TO:
SIVE PAGET & RIESEL, P.C.
560 LEXINGTON AVENUE, 15TH FLOOR
NEW YORK, NY 10022
212-421-2150
NDUNCAN@SPRLAW.COM

PROPERTY DATA

Borough	Block	Lot		Unit	Address
BROOKLYN	456	13	Entire Lot		544 CARROLL STREET

Property Type: NON-RESIDENTIAL VACANT LAND Easement

CROSS REFERENCE DATA

CRFN________ *or* DocumentID_________ *or* ________ Year_____ Reel____ Page_____ *or* File Number___________

PARTIES

GRANTOR/SELLER:
CARROLL STREET BORROWER, LLC
C/O: AVERY HALL INVESTMENTS, 497 CARROLL STREET, 6TH FLOOR
BROOKLYN, NY 11215

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

FEES AND TAXES

Mortgage :

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

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

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK

1625

Recorded/Filed 07-18-2024 09:56
City Register File No.(CRFN):
2024000183575

Colette McClain-Jacques

City Register Official Signature

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

THIS INDENTURE made this 8th day of July, 2024, between Owner, Carroll Street Borrower, LLC, having an office at c/o Avery Hall Investments, 497 Carroll St., Suite 61, 6th Floor, Brooklyn, County of Kings, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee"), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

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

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

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

WHEREAS, Grantor, is the owner of real property located at the address of 272 4th Avenue a/k/a 544 Carroll Street in the City of New York, County of Kings and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 456 Lot 13 (fka Lots 13, 17, & 23), being the same as that property conveyed to Grantor by deeds dated September 14, 2023 and recorded in the City Register of the City of New York in City Register File Nos. 2023000261249 & 2023000261250. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.3470 +/- acres, and is hereinafter more fully described in the Land Title Survey dated May 24, 2024 prepared by Patrick Benedict Jones (License No. 050624) of New York City Land Surveyors, PC, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

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

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C224298-10-19, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

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

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

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

Law.

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

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

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

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

(i) are in-place;

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

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

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

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

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

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

(7) the information presented is accurate and complete.

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

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

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

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

5. Enforcement

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

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

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

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

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

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

Parties shall address correspondence to:

Site Number: C224298
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

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

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

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the

recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

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

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

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

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

Remainder of Page Intentionally Left Blank

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

Carroll Street Borrower, LLC:

By: ____________________

Print Name: JESSE WARK

Title: AUTHORIZED SIGNATORY Date: 6/27/24

Grantor's Acknowledgment

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

On the 27 day of June, in the year 20 24 before me, the undersigned, personally appeared JESSE WARK, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(~~s~~) whose name is (~~are~~) subscribed to the within instrument and acknowledged to me that he/~~she/th~~ey executed the same in his/~~her/the~~ir capacity(~~ies~~), and that by his/h~~er/the~~ir signature(~~s~~) on the instrument, the individual(~~s~~), or the person upon behalf of which the individual(~~s~~) acted, executed the instrument.

Charles E Segure
Notary Public - State of New York

CHARLES E. SEGURE, JR.
Notary Public - State Of New York
No. 01SE6136197
Qualified in Kings County
My Commission Expires November 21, 2025

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

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

Grantee's Acknowledgment

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

On the 8th day of July, in the year 2024 before me, the undersigned, personally appeared Andrew O. Guglielmi, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Cheryl A Salem
Notary Public - State of New York

Cheryl A. Salem
Notary Public State of New York
Registration No. 01SA0002177
Qualified in Albany County
My Commission Expires March 3, 2027

SCHEDULE "A" PROPERTY DESCRIPTION

Environmental Easement Area (Lot 13):

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

BEGINNING at the corner formed by the intersection of the northwesterly side of 4th Avenue and the southwesterly side of Carroll Street;

RUNNING THENCE southwesterly along said northwesterly side of 4th Avenue, a distance of 117 feet 8 inches to a point;

THENCE northwesterly and parallel with First Street, a distance of 97 feet 10-1/2 inches to a point;

THENCE northeasterly and parallel with 4th Avenue, a distance of 24 feet 0 inches to a point;

THENCE northwesterly and parallel with First Street, a distance of 79 feet 11-1/4 inches to the southwesterly side of Carroll Street;

THENCE southeasterly along said southwesterly side of Carroll Street, a distance of 147 feet 8-5/8 inches to the point or place of BEGINNING.

Easement Area (Parcel A, B, and C) = 15,155.69 sq. ft. (0.3470 acres)

Deed Descriptions (Former Lots 13, 17 & 23):

Former Lot 23 Deed (CRFN: 2023000261250):

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

Parcel C-1 (part of Lot 23):
BEGINNING at the corner formed by the intersection of the northwesterly side of 4th Avenue and the southwesterly side of Carroll Street;

RUNNING THENCE southwesterly along the northwesterly side of 4th Avenue, 37 feet 8 inches;

THENCE northwesterly, parallel with First Street, 97 feet 10-1/2 inches;

THENCE northeasterly and parallel with 4th Avenue, 28 feet 6-1/2 inches, more or less, to the southwesterly side of Carroll Street;

THENCE southeasterly along the southwesterly side of Carroll Street 98 feet 3 inches, more or less, to the aforesaid corner of Carroll Street and 4th Avenue, at point or place of BEGINNING.

Parcel C-1 Area = 3,239.56 sq. ft (0.0744 acres)

Parcel C-2 (part of Lot 23):
BEGINNING at a point on the northwesterly side of 4th Avenue distant 276 feet northeasterly from the corner formed by the intersection of the northeasterly side of First Street with the northwesterly side of 4th Avenue;

RUNNING THENCE northeasterly along the northwesterly side of 4th Avenue, 40 feet;

THENCE northwesterly and parallel with First Street, 97 feet 10-1/2 inches;

THENCE southwesterly and parallel with 4th Avenue, 40 feet;

THENCE southeasterly and parallel with First Street, 97 feet 10-1/2 inches to the northwesterly side of 4th Avenue, at point or place of BEGINNING.

Parcel C-2 Area = 3,914.80 sq. ft (0.0899 acres)

Parcel C-3 (part of Lot 23):
BEGINNING at a point on the northwesterly side of 4th Avenue distant 256 feet northeasterly from the corner formed by the intersection of the northeasterly side of First Street with the northwesterly side of 4th Avenue;

RUNNING THENCE northeasterly along the northwesterly side of 4th Avenue, 20 feet;

THENCE northwesterly and parallel with First Street, 97 feet 10-1/2 inches;

THENCE southwesterly and parallel with 4th Avenue, 20 feet;

THENCE southeasterly and parallel with First Street, 97 feet 10-1/2 inches to the northwesterly side of 4th Avenue, at the point or place of BEGINNING.

Parcel C-3 Area = 1,957.40 sq. ft (0.0449 acres)

Combined Parcel C (Former Lot 23) Area = 9,111.76 sq. ft. (0.2091 acres)

Former Lots 13 & 17 Deed (CRFN: 2023000261249)

Parcel A:
ALL THAT CERTAIN plot, piece or parcel of land, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at a point on the southwesterly side of Carroll Street, distant 40 feet 11-5/8 inches southeasterly from the corner formed by the intersection of Denton Place;

RUNNING THENCE southwesterly parallel with Denton Place, 79 feet 11-3/8 inches to a point in the line drawn parallel with First Street and distant 260 feet northeasterly from the northeasterly side thereof;

THENCE southeasterly parallel with First Street, 49 feet 8-1/4 inches to a point in a line drawn parallel with Denton Place and distant 90 feet southeasterly from the southeasterly side thereof as measured along a line drawn at right angles thereto;

THENCE northeasterly parallel with Denton Place, 85 feet 6 inches to the southwesterly side of Carroll Street;

THENCE northwesterly along the southwesterly side of Carroll Street, 49 feet 5 inches to the point or place of BEGINNING.

Parcel A Area = 4,046.52 sq. ft (0.0928 acres)

Parcel B:

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

BEGINNING at a point on the northwesterly side of Fourth Avenue, distant 236 feet northeasterly from the corner formed by the intersection of the northeasterly side of First Street with the northwesterly side of Fourth Avenue;

RUNNING THENCE northeasterly along the northwesterly side of Fourth Avenue, 20 feet;

THENCE northwesterly and parallel with First Street, 97 feet 10-1/2 inches;

THENCE southwesterly and parallel with Fourth Avenue; 20 feet;

THENCE southeasterly and parallel with First Street, 97 feet 10-1/2 inches to the northwesterly side of Fourth Avenue, at the point or place of BEGINNING.

Parcel B Area = 1,957.40 sq. ft (0.0449 acres)

Legal Descriptions of Environmental Easement Area

Deeds filed in CRFN 2023000261249 & 2023000261250

PARCEL A (Former Tax lot 17)

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

BEGINNING at a point on the southwesterly side of Carroll Street, distant 40 feet 11-5/8 inches southeasterly from the corner formed by the intersection of Denton Place;

RUNNING THENCE southwesterly parallel with Denton Place, 79 feet 11-3/8 inches to a point in a line drawn parallel with First Street and distant 260 feet northeasterly from the northeasterly side thereof;

THENCE southeasterly parallel with First Street, 49 feet 8-1/4 inches to a point in a line drawn parallel with Denton Place and distant 90 feet southeasterly from the southeasterly side thereof as measured along a line drawn at right angles thereto;

THENCE northeasterly parallel with Denton Place, 85 feet 6 inches to the southwesterly side of Carroll Street;

THENCE northwesterly along the southwesterly side of Carroll Street, 49 feet 5 inches to the point or place of BEGINNING.

Parcel A Area= 4,046.52 sq. ft. (0.0928 Acres)

PARCEL B (Former Tax Lot 13)

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

BEGINNING at a point on the northwesterly side of Fourth Avenue, distant 236 feet northeasterly from the corner formed by the intersection of the northeasterly side of First Street with the northwesterly side of Fourth Avenue;

RUNNING THENCE northeasterly along the northwesterly side of Fourth Avenue, 20 feet;

THENCE northwesterly and parallel with First Street, 97 feet 10-1/2 inches;

THENCE southwesterly and parallel with Fourth Avenue, 20 feet;

THENCE southeasterly and parallel with First Street, 97 feet 10-1/2 inches to the northwesterly side of Fourth Avenue, at the point or place of BEGINNING.

Parcel B Area= 1,957.40 sq. ft. (0.0449 Acres)

PARCEL C (Former Tax Lot 23)

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

Parcel C-1 (part of Lot 23):

BEGINNING at the corner formed by the intersection of the northwesterly side of 4th Avenue and the southwesterly side of Carroll Street;

RUNNING THENCE southwesterly along the northwesterly side of 4th Avenue, 37 feet 8 inches;

THENCE northwesterly, parallel with First Street, 97 feet 10-1/2 inches;

THENCE northeasterly and parallel with 4th Avenue, 28 feet 6-1/2 inches, more or less, to the southwesterly side of Carroll Street;

THENCE southeasterly along the southwesterly side of Carroll Street 98 feet 3 inches, more or less, to the aforesaid corner of Carroll Street and 4th Avenue, at point or place of BEGINNING.

Parcel C-1 Area= 3,239.56 sq. ft. (0.0744 Acres)

Parcel C-2 (part of Lot 23):

BEGINNING at a point on the northwesterly side of 4th Avenue distant 276 feet northeasterly from the corner formed by the intersection of the northeasterly side of First Street with the northwesterly side of 4th Avenue;

RUNNING THENCE northeasterly along the northwesterly side of 4th Avenue, 40 feet;

THENCE northwesterly and parallel with First Street, 97 feet 10-1/2 inches;

THENCE southwesterly and parallel with 4th Avenue, 40 feet;

THENCE southeasterly and parallel with First Street, 97 feet 10-1/2 inches to the northwesterly side of 4th Avenue, at point or place of BEGINNING.

Parcel C-2 Area= 3,914.80 sq. ft. (0.0899 Acres)

Parcel C-3 (part of Lot 23):

BEGINNING at a point on the northwesterly side of 4th Avenue distant 256 feet northeasterly from the corner formed by the intersection of the northeasterly side of First Street with the northwesterly side of 4th Avenue;

RUNNING THENCE northeasterly along the northwesterly side of 4th Avenue, 20 feet;

THENCE northwesterly and parallel with First Street, 97 feet 10-1/2 inches;

THENCE southwesterly and parallel with 4th Avenue, 20 feet;

THENCE southeasterly and parallel with First Street, 97 feet 10-1/2 inches to the northwesterly side of 4th Avenue, at the point or place of BEGINNING.

Parcel C-3 Area= 1,957.40 sq. ft. (0.0449 Acres)

Combined Parcel C (Former Tax Lot 23) Area= 9,111.76 sq. ft. (0.2091 Acres)

Combined Legal Description of Easement Area

Deeds filed in CRFN 2023000261249 & 2023000261250

Said Parcels A, B and C, also being described as follows:

Perimeter Description (PARCELS A, B & C- Current Tax Lot 13):

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

BEGINNING at the corner formed by the intersection of the northwesterly side of 4th Avenue and the southwesterly side of Carroll Street;

RUNNING THENCE southwesterly along said northwesterly side of 4th Avenue, a distance of 117 feet 8 inches to a point;

THENCE northwesterly and parallel with First Street, a distance of 97 feet 10-1/2 inches to a point;

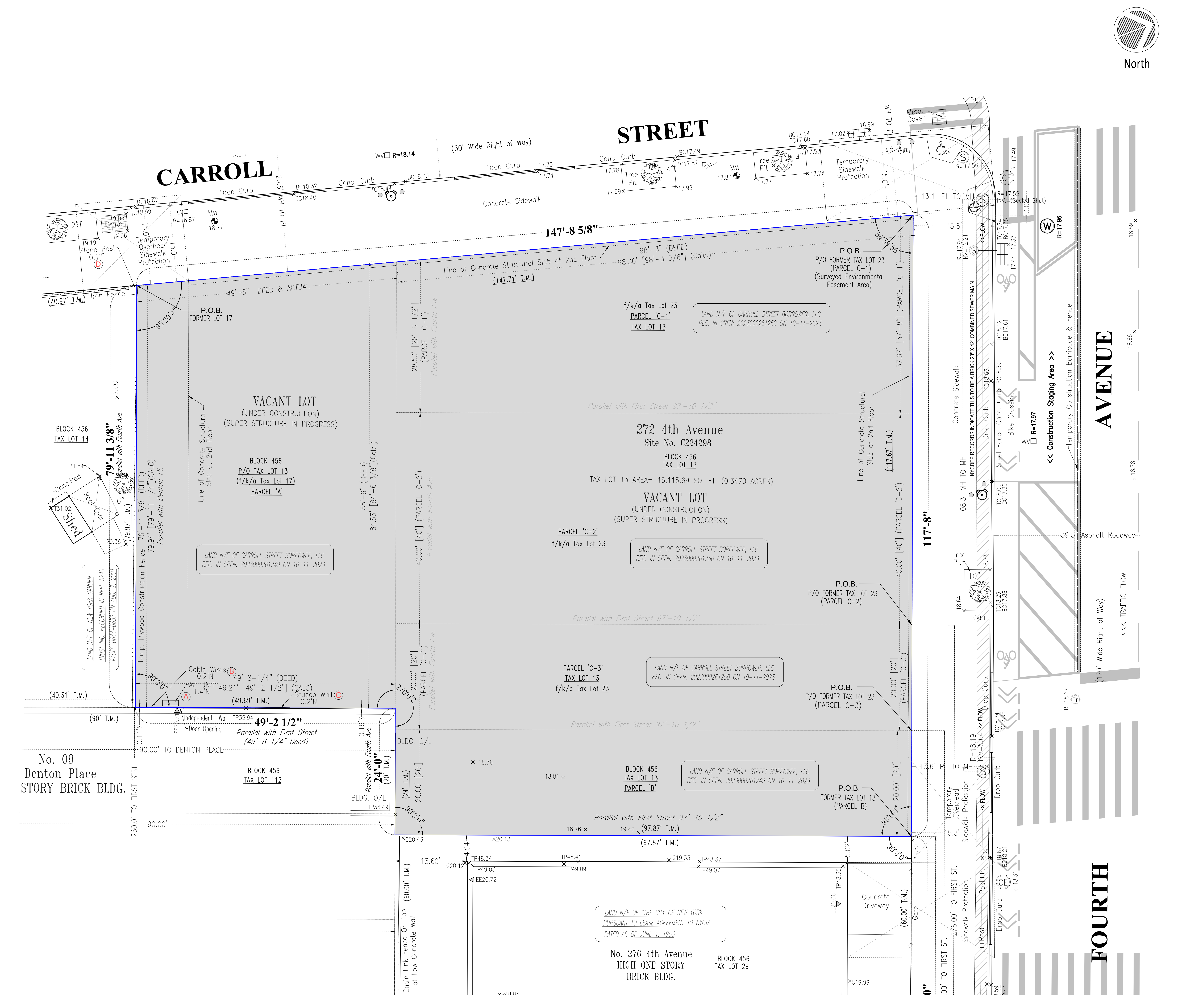
THENCE northeasterly and parallel with 4th Avenue, a distance of 24 feet 0 inches to a point;

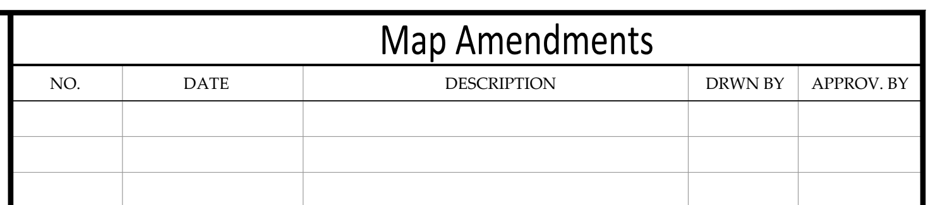
THENCE northwesterly and parallel with First Street, a distance of 49 feet 2-1/2 inches to a point;

THENCE northeasterly and parallel with Denton Place, a distance of 79 feet 11-1/4 inches to the southwesterly side of Carroll Street;

THENCE southeasterly along said southwesterly side of Carroll Street, a distance of 147 feet 8-5/8 inches to the point or place of BEGINNING.

Easement Area (Parcel A,B, and C)=15,115.69 sq. ft. (0.3470 Acres)





NO.	DATE	DESCRIPTION	DRWN BY	APPROV. BY

NYS Department of Environmental Conservation Notes:

"This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law. The engineering and institutional controls for this Easement are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@dec.ny.gov".

General Notes:

1. **Not responsible for the location for any Underground Structures, Vaults, Tanks or other appurtenances. The user of this Survey should be aware that written and unwritten easements may give others Rights which may affect the use of this Property.**
2. **Unauthorized Alteration or Addition to a Survey Map bearing a License Land Surveyor Seal is a Violation of Section 7209, Sub-Division 2, of the New York State Education Law.**
3. **"Copies from the Original of this Survey Map not marked with an Original of the Land Surveyor's Inked Seal or his/her Embossed Seal shall not be considered a Valid True Copy.**
4. **All Elevations noted on this Survey are referenced to the North American Vertical Datum of 1988 as established and maintained by the National Geodetic Survey of the National Oceanic and Atmospheric Administration or successor Agency, which is hereby established the City Datum by Local Law 96 of 2013.**
5. **The offsets and dimensions shown from the Structures to the Property Line are for a specific purpose and use and therefore are not intended to guide the erection of Structures and any other Construction.**
6. **Before performing any excavation or drilling on this Site, it is required that Subsurface Service, including the underground Mains, Ducts, and Cables be marked and identified by the Utility Company or Agency involved, this should be done by providing the affected Utility with the notice referred to tin the Sate of New York Industrial Code 53.**
7. **Certifications on this Boundary Survey Map signify that the Map was prepared in accordance with the current existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors, Inc.**

Land Areas

Area of Tax Lot 13= 15,115.69 sq feet (0.3470 Acres)
Area of Tax Lot 14 = 3,183.13 sq. ft. (0.0731 Acre)
Area of Tax Lot 29 = 5,872.20 sq. ft. (0.1348 Acres)

Flood Note

By graphic plotting only, this property lies in Zone X of the Flood Insurance Rate Map, Community Panel No. 3604970211F, which bears the effective date of September 5, 2007, the current flood map, and IS NOT in a Special Flood Hazard Area. Zone X are areas determined to be outside the 0.2% annual chance flood plan.

nycls

New York City Land Surveyors, PC
63 Montgomery Avenue, S.I., NY 10301
Phone: 718-816-8182 Fax: 718-816-8124
www.nycsurveyors.com

Client: Carroll Street Borrower LLC

Map of Survey of Property
in the
County of Kings
Borough of Brooklyn
City of New York

Site Address:
272 4TH AVENUE
(a/k/a 544 CARROLL STREET)
BROOKLYN NY 11215

Block:	456
Lot(s):	13
Project Number:	2022-30-456K
Survey Date:	05-16-2024
Survey Title:	NYS DEC EASEMENT SURVEY
Scale:	1"=20'
Drawn By:	J.D.
Approved By:	P. Jones

Surveyors Certificate

To:

Carroll Street Borrower LLC:

This is to certify that this survey was prepared in accordance with the existing code of practice for land surveys, adopted by the New York State Association of Professional Land Surveyors, and said certifications shall run only to the person for whom the survey was prepared, and on his/her behalf to the title company, governmental agency and lending institution listed hereon, and to the assignee of the lending institution, certifications are not transferable to additional institutions or subsequent owners.

Date of Plat or Map: May 24, 2024

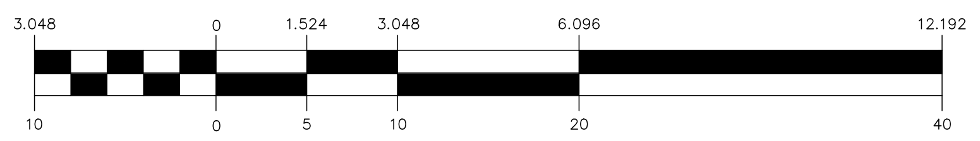
PATRICK BENEDICT JONES 050624

Patrick B. Jones
New York State Licensed Land Surveyor
License # 050624

Statement of Encroachments

Ⓐ AC Unit of Lot 112 Encroaching 1.4'N onto Lot 17
Ⓑ Cable Wires of Lot 112 Encroaching 0.2'N onto Lot 17
Ⓒ Stucco Wall of Lot 112 Encroaching 0.2'N onto Lot 17
Ⓓ Stone Post of Lot 14 Encroaching 0.1'E onto Lot 17

Graphic Scale



1 inch = 3.048 m. / 1 inch = 10 Feet

Abbreviations

TOP OF CURB ELEVATION	× TC13.29
BOTTOM OF CURB ELEVATION	× BC13.29
TOP OF WALL ELEVATION	× TW13.29
BASE OF ROOF ELEVATION	× R13.29
TOP OF VENT ELEVATION	× TV13.29
TOP OF PARAPET ELEVATION	× TP13.29
SPOT ELEVATION	× 13.29
BLDG.	BUILDING
BM	BENCHMARK
C.C.	CONCRETE CURB
CL	CENTERLINE
C.L.F.	CHAIN LINK FENCE
CONC.	CONCRETE
CRFN	CITY REGISTER FILE NUMBER

Abbreviations

C.W.	CONCRETE WALL
D.C.	DROP CURB
ELEC.	ELECTRIC
F.R.P.	FROM RECORD PLAN
FL.	FLOOR
I.F.	IRON FENCE
MON.	MONUMENT
M.B.P.O.	MANHATTAN BOROUGH PRESIDENTS OFFICE
R.O.W.	RIGHT OF WAY
S.F.C.	STEEL FACE CURB
T.M.	TAX MAP
T.P.	TREE PIT
T.V.	TITLE VESTED
TW	TOP OF WALL ELEVATION

Legend of Symbols

ANCHOR	◎
CABLE TV IRON	Ⓒ
CAMERA SECURITY	⌓
CATCH BASIN	▦
COAL CHUTE	○CC
DEPRESSED CURB (DC)	⫽
DRAIN INLET	▦
FIRE HYDRANT (HIGH PRESSURE)	⊗
FIRE CALL BOX	☒
HANDICAP	♿
GUY WIRE (TENSION CABLE FOR VERTICAL POLE)	○—
GAS MANHOLE	Ⓖ
MAILBOX	MB☒
MONITORING WELL	◑
N.Y.F.D.	Ⓕ

Legend of Symbols

ENTRANCE ELEVATION	◁ EE 13.29
CELLAR ENTRANCE ELEVATION	◁ CE 13.29
GARAGE ENTRANCE ELEVATION	◁ GE 13.29
UNKNOWN UTILITY MANHOLE	Ⓤ
WATER MANHOLE	Ⓦ
ELECTRIC MANHOLE	Ⓔ
SEWER MANHOLE	Ⓢ
VENT PIPE	VP ●
MONITORING VALVE	MV ⊕
FIRE HYDRANT (LOW PRESSURE)	⊗
GAS VALVE	GV☒
OIL FILL	OF⊗
WATER VALVE	WV☒
SPOT ELEVATION	× 13.29
PARKING METER (MUNI-METER)	PM☒

Legend of Symbols

MISCELLANEOUS TRAFFIC SIGN	TS ⊖
BOLLARD	●
ENTRANCE ELEVATION	◀ EE 13.29
LEGAL GRADE/ ACTUAL GRADE FROM FINAL MAP	[72.86] NAV88
LEGAL GRADE INTERPOLATED	*[72.86] NAV88 INT.*
UNDERGROUND UTILITY VAULT	Ⓔ
NYCDOT TRAFFIC SIGN	TS ○
ELECTRIC UTILITY BOX	E
METAL LIGHT POLE w/ PEDESTRIAN SIGNAL	PS Ⓛ
STANDPIPE/ SIAMESE CONNECTION (GROUND)	SPKR.
STANDPIPE/ SIAMESE CONNECTION (WALL-MOUNTED)	SPKR
TAX BLOCK NUMBER	BLOCK 1027
TAX LOT NUMBER	TAX LOT 35
TREE	✳
TRAFFIC DIRECTION (ONE-WAY/ TWO-WAY)	⇨ ⇔

APPENDIX B
LIST OF SITE CONTACTS

APPENDIX B
LIST OF SITE CONTACTS

Name	**Phone/Email Address**
Carroll Street Borrower LLC 272 4th Avenue LLC 274 4th and 538 Carroll LLC Site Owner and Remedial Party	(215) 435-9310 / alexander@averyhallinvestments.com
Marc Godick, AKRF, Inc. QA/QC Manager	(914) 922-2356 / mgodick@akrf.com
Rebecca Kinal, P.E., AKRF, Inc. Remedial Engineer	(914) 922-2362 / rkinal@akrf.com
Patrick Diggins, AKRF, Inc. Project Manager	(914) 922-2784 / jdiggins@akrf.com
Steven Wu NYSDEC Project Manager	(718) 482-6725 / steven.wu@dec.ny.gov
Andre Obligado NYSDEC Section Chief	718-482-6412 / andre.obligado@dec.ny.gov
Jane O’Connell NYSDEC	(718) 482-4599 / jane.oconnell@dec.ny.gov
Len Zinoman NYSDEC Site Control	(518) 402-9553 / leonard.zinoman@dec.ny.gov
James Sullivan NYSDOH Project Manager	(518) 402-7860 / james.sullivan@health.ny.gov

APPENDIX C
RESPONSIBILITIES OF OWNER AND REMEDIAL PARTY

APPENDIX C
RESPONSIBILITIES of OWNER and REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan ("SMP") for the 272 4th Ave site (the "Site"), BCP Site No. C224298 are divided between the site owner(s) and a Remedial Party, as defined below. The owner(s) and operators is/are currently listed as:

Carroll Street Borrower LLC
272 4th Avenue LLC
274 4th and 538 Carroll LLC
497 Carroll Street, 6th Floor
Brooklyn, NY 11215

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

Carroll Street Borrower LLC
272 4th Avenue LLC
274 4th and 538 Carroll LLC
497 Carroll Street, 6th Floor
Brooklyn, NY 11215

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

Site Owner's Responsibilities:

1. The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the Site.
2. In accordance with a periodic time frame determined by the NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the Site's Periodic Review Report ("PRR") certification to the NYSDEC.
3. In the event the Site is delisted, the owner remains bound by the Environmental Easement and shall submit, upon request by the NYSDEC, a written certification that the Environmental Easement is still in place and has been complied with.
4. The owner shall grant access to the Site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP, and ensure compliance with the SMP.
5. The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. If damage to the remedial components or vandalism is evident, the owner shall notify the Site's RP and the NYSDEC in accordance with the timeframes indicated in Section 1.3 of the SMP – Notifications.

6. If some action or inaction by the owner adversely impacts the Site, the owner must notify the Site's RP and the NYSDEC in accordance with the time frame indicated in Section 1.3 of the SMP – Notifications, and coordinate the performance of necessary corrective actions with the RP.
7. The owner must notify the RP and the NYSDEC of any change in ownership of the Site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the Site property. 6 NYCRR Part 375 contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: 60 days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 1.3 of the SMP. A change of use includes, but is not limited to, any activity that may increase direct human or environmental exposure (e.g., day care, school, or park). A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.
8. Until such time as the NYSDEC deems the vapor mitigation system unnecessary, the owner shall operate the system, pay for the utilities for the system's operation, and report any maintenance issues to the RP and the NYSDEC.
9. In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data that is produced with respect to structures and that exceeds New York State Department of Health ("NYSDOH") or United States Occupational Safety and Health Administration ("OSHA") guidelines on the site, whether produced by the NYSDEC, RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

Remedial Party Responsibilities

1. The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the Site.
2. The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, PRRs and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.
3. Before accessing the Site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the Site visit and/or any final report produced.
4. If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).
5. The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any mitigation system (Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html .
6. The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3 of the SMP – Notifications.

7. The RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the Site, as required in Section 5.0 of the SMP.
8. The RP is responsible for the proper monitoring and maintenance of any installed drinking water treatment system associated with the Site, as required in Section 5.0 of the SMP.
9. Prior to a change in use that impacts the mitigation system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.
10. Any change in use, change in ownership, change in site classification (e.g., delisting), reduction or expansion of remediation, and other significant changes related to the Site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the NYSDEC project manager to discuss the need to update such documents.

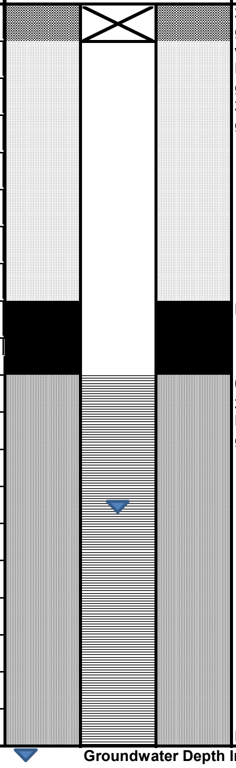
Change in RP ownership and/or control and/or Site ownership does not affect the RP's obligations with respect to the Site unless a legally binding document executed by the NYSDEC releases the RP of its obligations.

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

APPENDIX D
POST-REMEDIAL MONITORING WELL CONSTRUCTION LOGS

SOIL BORING AND WELL INSTALLATION LOG	274 4th Avenue Brooklyn, NY AKRF Project Number: 190021	**Groundwater Monitoring Well ID:** Sheet 1 of 1	**MW-01**	**Soil Boring ID:** **SB-01**

AKRF 440 Park Avenue South, 7th Floor New York, NY 10016	**Drilling Method:**	Geoprobe 6610DT	**Drilling**	
	Sampling Method:	5' Acetate Liners	**Start Time:** 14:00	**Finish Time:** 14:30
	Driller:	AARCO		
	Weather:	38-49°F, Cloudy	**Date:** 4/5/2024	
	Logged by:	D. Fujimoto, AKRF		

Depth (feet)	Well Construction	**Surface Condition:** Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1 2 3 4 5		**2" diameter PVC well casing, locking j-plug: grade to 4' above grade. (Flush-mounted well cover, locking j-plug, and concrete Non-shrinking cement grout: 0' to 1' below grade (not installed yet).** **2" diameter PVC well casing: 0' to 10'below grade.**	44	Brown SAND, some fine Gravel, Silt (Clean imported FILL).	ND	Dry	ND	ND	
6 7 8 9 10		**Bentonite seal: 8' to 10' below grade.**	40	Brown SAND, some fine Gravel, Silt (Clean imported FILL).	ND	Dry	ND	ND	
11 12 13 14 15		**0.020-inch slotted PVC well screen: 10' to 20' below grade.** **No. 2 morie sandpack filter: 10' to 20' below grade.**	45	Top 20": Brown SAND, some fine Gravel, Silt (Clean imported FILL). Bottom 25": Fine GRAVEL, trace brown Sand.	ND ND	Wet Wet	ND ND	ND ND	
16 17 18 19 20		**End cap: 20' below grade.**	46	Top 12": Fine GRAVEL, some Gray Sand, little Silt Bottom 34": Brown SAND, trace Silt.	Faint petro-like ND	Wet Wet	Little PID detection Little PID detection	Oily Sheen ND	

Notes: ▼ **Groundwater Depth Indicator**

Groundwater measured at 13.87 feet below grade in SB-GW-01 on April, 2024.

Groundwater monitoring well installed to 20.06 feet below grade.

Soil samples analyzed for TCL VOCs, TCL SVOCs, Pesticides, PCBs, TAL Metals, Hexavalent Chromium, 1,4-Dioxane, Total Cyanide, and PFAS.

Groundwater encountered at approximately 14 feet below grade during soil boring installation.

End of soil boring at 20 feet below grade.

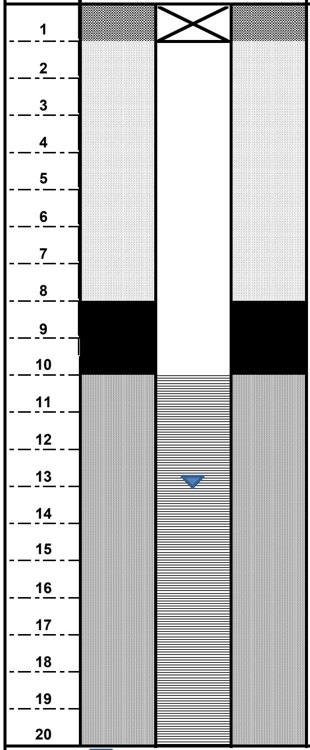
PID = photoionization detector **NAPL = non-aqueous phase liquid** **ppm = parts per million** **ND = not detected**

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	**274 4th Avenue** **Brooklyn, NY** **AKRF Project Number: 190021**	**Groundwater Monitoring Well ID:** **Sheet 1 of 1**	**MW-02**	**Soil Boring ID:** **SB-02**

AKRF 440 Park Avenue South, 7th Floor New York, NY 10016	**Drilling Method:**	Geoprobe 6610DT	**Drilling**	
	Sampling Method:	5' Acetate Liners	**Start Time:** 13:00	**Finish Time:** 13:30
	Driller:	AARCO		
	Weather:	38-49°F, Cloudy	**Date:** 4/5/2024	
	Logged by:	D. Fujimoto, AKRF		

Well Construction — **Surface Condition:** Concrete



2" diameter PVC well casing, locking j-plug: grade to 4' above grade. (Flush-mounted well cover, locking j-plug, and concrete Non-shrinking cement grout: 0' to 1' below grade (not installed yet).
2" diameter PVC well casing: 0' to 10'below grade.

Bentonite seal: 8' to 10' below grade.

0.020-inch slotted PVC well screen: 10' to 20' below grade.
No. 2 morie sandpack filter: 10' to 20' below grade.

End cap: 20' below grade.

Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
43	Brown SAND, some fine Gravel, Silt (Clean imported FILL).	ND	Dry	ND	ND	
45	Brown SAND, some fine Gravel, Silt (Clean imported FILL).	ND	Dry	ND	ND	
43	Top 15": Brown SAND, some fine Gravel, Silt (Clean imported FILL).	ND	Wet	ND	ND	
	Bottom 28": Fine GRAVEL, trace brown Sand.	ND	Wet	ND	ND	
54	Top 12": Brown SAND, trace fine Gravel, Silt, Brick (FILL).	ND	Wet	ND	ND	
	Bottom 42": Brown SILT, trace Sand, fine Gravel.	ND	Wet	ND	ND	

Notes: ▼ **Groundwater Depth Indicator**

Groundwater measured at 13.22 feet below grade in SB-GW-02 on April 5, 2024.

Groundwater monitoring well installed to 20.31 feet below grade.

Soil samples analyzed for TCL VOCs, TCL SVOCs, Pesticides, PCBs, TAL Metals, Hexavalent Chromium, 1,4-Dioxane, Total Cyanide, and PFAS.
Groundwater encountered at approximately 13 feet below grade during soil boring installation.
End of soil boring at 20 feet below grade.

PID = photoionization detector **NAPL = non-aqueous phase liquid** **ppm = parts per million** **ND = not detected**

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

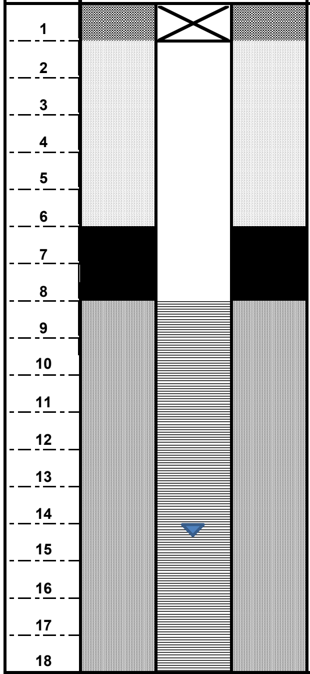
SOIL BORING AND WELL INSTALLATION LOG	**274 4th Avenue** **Brooklyn, NY** **AKRF Project Number: 190021**	**Groundwater Monitoring Well ID:** **Sheet 1 of 1**	**MW-03**	**Soil Boring ID:**	**SB-03**

AKRF

440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Geoprobe 6610DT	**Drilling**	
Sampling Method:	5' Acetate Liners	**Start Time:** 09:20	**Finish Time:** 09:50
Driller:	AARCO		
Weather:	38-49°F, Cloudy	**Date:** 4/5/2024	
Logged by:	D. Fujimoto, AKRF		

Depth (feet) | **Well Construction** | **Surface Condition:** Concrete



Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.

Non-shrinking cement grout: 0' to 1' below grade.
2" diameter PVC well casing: 0' to 8'below grade.

Bentonite seal: 6' to 8' below grade.

0.020-inch slotted PVC well screen: 8' to 18' below grade.
No. 2 morie sandpack filter: 8' to 18' below grade.

End cap: 18' below grade.

Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
44	Top 8": CONCRETE (FILL).	ND	Dry	ND	ND	
	Bottom 36": Brown SAND, some fine Gravel, Silt (Clean imported FILL).	ND	Dry	ND	ND	
45	Brown SAND, some fine Gravel (Clean Imported Fill).	ND	Dry	ND	ND	
		ND	Dry	ND	ND	
40	Brown SAND, trace fine Gravel, Silt, Brick (FILL).	ND	Wet	ND	ND	
32	Top 12": Brown SAND, trace fine Gravel, Silt, Brick (FILL).	ND	Wet	ND	ND	
	Bottom 20": Brown SILT, trace Sand, fine Gravel.	ND	Wet	ND	ND	

Notes: ▼ **Groundwater Depth Indicator**

Groundwater measured at 14.45 feet below grade in SB-MW-01 on April 5, 2024.

Groundwater monitoring well installed to 18.21 feet below grade.

Soil samples analyzed for TCL VOCs, TCL SVOCs, Pesticides, PCBs, TAL Metals, Hexavalent Chromium, 1,4-Dioxane, Total Cyanide, and PFAS.
Groundwater encountered at approximately 14 feet below grade during soil boring installation.
End of soil boring at 18 feet below grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ppm = parts per million ND = not detected

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

APPENDIX E
EXCAVATION WORK PLAN (EWP)

APPENDIX E
EXCAVATION WORK PLAN (EWP)

1.1 Notification

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination or breach or alter the Site's cover system, the Site owner or their representative will notify the New York State Department of Environmental Conservation (NYSDEC) contacts listed in **Table E-1,** below. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in **Appendix B.**

Table E-1
Notifications*

Contact	Phone Number /Email Address
Steven Wu NYSDEC Project Manager	(718) 482-6725 / steven.wu@dec.ny.gov
Jane O'Connell NYSDEC	(718) 482-4599 / jane.oconnell@dec.ny.gov
Len Zinoman NYSDEC Site Control	(518) 402-9553 / leonard.zinoman@dec.ny.gov

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

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated, any modifications of truck routes, and any work that may impact an engineering control (EC);
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work, and submittals (e.g., reports) to the NYSDEC documenting the completed intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP, 29 CFR 1910.120 and 29 CFR 1926 Subpart P;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in **Appendix F** of this Site Management Plan (SMP);
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with the required request to import form and all supporting documentation including, but not limited to, chemical testing results.

The NYSDEC project manager will review the notification and may impose additional requirements for the excavation that are not listed in this EWP. The alteration, restoration and modification of ECs must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

1.2 Soil Screening Methods

Visual, olfactory, and instrument-based (e.g. photoionization detector) soil screening will be performed during all excavations into known or potentially contaminated material (remaining contamination) or a breach of the cover system. A qualified environmental professional (QEP) as defined in 6 New York Codes, Rules, and Regulations (NYCRR) Part 375, a Professional Engineer (P.E.) who is licensed and registered in New York State, or a qualified person who directly reports to a P.E. who is licensed and registered in New York State will perform the screening. Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion (COC).

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Sections 1.6 and 1.7 of this Appendix.

1.3 Soil Staging Methods

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters, and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

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

1.4 Materials Excavation and Load-Out

A QEP as defined in 6 NYCRR Part 375, a P.E. who is licensed and registered in New York State, or a qualified person who directly reports to a P.E. who is licensed and registered in New York State will oversee all invasive work and the excavation and load-out of all excavated material.

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

The presence of utilities and easements on the Site will be investigated by the QEP. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site. A site utility stakeout will be completed for all utilities prior to any ground intrusive activities at the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements). Trucks transporting contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides.

A truck wash will be operated on-site, as appropriate. The QEP will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The QEP will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials. Material accumulated from the street cleaning and egress cleaning activities will be disposed off-site at a permitted landfill facility in accordance with all applicable local, state, and federal regulations.

1.5 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes are as follows:

- Trucks entering the Site will exit Interstate 278 at Exit 23 Eastbound and merge onto 38th Street until the intersection with 4th Avenue. Trucks will turn left onto 4th Avenue, then follow the road until the intersection with 3rd Street, where they will turn left. Trucks will then turn right onto 3rd Avenue, and at the intersection with Carroll Street they will turn right and travel east to the Site.
- Trucks leaving the Site will exit by turning right onto 4th Avenue and will travel along west 4th Avenue until the intersection with 15th Street. Trucks will turn right onto 15th Street, then make a left onto 3rd Avenue until merging onto Interstate 278 West by turning right.

All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. These are the most appropriate routes and take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the Site.

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

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

1.6 Materials Disposal Off-Site

All material excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed off-site in a permitted facility in accordance with all local, state, and federal regulations. If disposal of material from the Site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC project manager. Unregulated off-site management of materials from the Site will not occur without formal NYSDEC project manager approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility, if appropriate [e.g., hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, construction and demolition (C&D) debris recovery facility]. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include, but will not be limited to: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled consistent with 6 NYCRR Parts 360, 361, 362, 363, 364 and 365. Material that does not meet Unrestricted Soil Cleanup Objectives (SCOs) is prohibited from being taken to a New York State C&D debris recovery facility (6 NYCRR Subpart 360-15 registered or permitted facility).

1.7 Materials Reuse On-Site

The QEP, as defined in 6 NYCRR Part 375, will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material (i.e., contaminated) does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within the cover system or within landscaping berms. Contaminated on-site material may only be used beneath the site cover as backfill for subsurface utility lines with prior approval from the NYSDEC project manager.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances guidance values, dated November 2022. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Sections 1.2 and 1.3 of this EWP. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of Site excavation activities and proximity to nearby site features. Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-site.

1.8 Fluids Management

All liquids to be removed from the Site, including, but not limited to, excavation dewatering, decontamination waters, and groundwater monitoring well purge and development waters, will be handled, transported, and disposed off-site at a permitted facility in accordance with applicable local, state, and federal regulations. Dewatering, purge, and development fluids will not be recharged back to the land surface or subsurface of the Site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e., a local pond, stream, or river) will be performed under a State Pollutant Discharge Elimination System (SPDES) permit.

1.9 Cover System Restoration

After the completion of soil removal and any other invasive activities, the cover system will be restored in a manner that complies with the Remedial Action Work Plan (RAWP) and Decision Document. The existing cover system is comprised of a minimum 6-inch-thick concrete building slabs and a minimum 2-foot clean soil cover in landscaped areas within the Site. The demarcation layer, consisting of orange snow fencing or black geotextile fabric, will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP. The alteration, restoration, and modification of ECs must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

1.10 Backfill from Off-Site Sources

All materials proposed for import onto the Site will be approved by the QEP, as defined in 6 NYCRR Part 375, and will be in compliance with the provisions in this SMP prior to receipt at the Site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager, allowing a minimum of 5 business days for review. A copy of the form is presented in **Appendix M** of the SMP.

Material from industrial sites, spill sites, other environmental remediation sites, or potentially contaminated sites will not be imported to the Site.

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) and DER-10 Appendix 5 for restricted residential use. Soils that meet ‘general’ fill requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by the NYSDEC project manager. Soil material will be sampled for the full suite of analytical parameters, including PFAS and 1,4-dioxane. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

1.11 Stormwater Pollution Prevention

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook, maintained at the Site, and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

1.12 Excavation Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition. The NYSDEC project manager will be promptly notified of the discovery.

Sampling will be performed on product, sediment, and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes [target analyte list (TAL) metals, target compound list (TCL) volatiles and semi-volatiles (including 1,4-dioxane), TCL pesticides and polychlorinated biphenyls (PCBs), and PFAS], unless the Site history and previous sampling results provide sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC project manager for approval prior to sampling. Any tanks will be closed as per NYSDEC regulations and guidance.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone within two hours to NYSDEC’s project manager. Reportable quantities of petroleum product will also be reported to the NYSDEC Spills hotline. These findings will be included in the Periodic Review Report.

1.13 Community Air Monitoring Plan

Air sampling stations will be based on generally prevailing wind conditions. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least one downwind monitoring station. If a sensitive receptor, such as a school, day care, or residential area, is adjacent to the Site, a fixed monitoring station will be located at that Site perimeter, regardless of wind direction.

Exceedances of action levels listed in the Community Air Monitoring Plan (CAMP) will be reported to the NYSDEC and New York State Department of Health (NYSDOH) project managers.

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

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for volatile organic compounds (VOCs) and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of ECs such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 part per million, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 micrograms per cubic meter, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 micrograms per cubic meter or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for the Site.

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

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

1.14 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors on- and off-site. Specific odor control methods to be used on a routine basis will include monitoring by the on-site QEP or personnel under their direct supervision. If nuisance odors are identified at the Site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party’s Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

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

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

1.15 Dust Control Plan

Particulate monitoring must be conducted according to the CAMP provided in Section 1.13 of this appendix. If particulate levels at the Site exceed the thresholds listed in the CAMP or if airborne dust is observed on the Site or leaving the Site, the dust suppression techniques listed below will be employed. The remedial party will also take measures listed below to prevent dust production on the Site.

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

- Dust suppression will be achieved using a dedicated hose connected to a fire hydrant (or similar water source). The hose will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles;
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production;
- Gravel will be used on roadways to provide a clean and dust-free road surface; and
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

1.16 Other Nuisances

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

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

APPENDIX F

HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN

272 4TH AVENUE

BROOKLYN, NEW YORK

Health and Safety Plan

NYSDEC Site Number: C224298
AKRF Project Number: 190021

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau B
625 Broadway, 12th Floor
Albany, New York 12233

On Behalf Of:

Carroll Street Borrower LLC
272 4th Avenue LLC
274 4th and 538 Carroll LLC
51 East 12th Street, 7th Floor
New York, New York 10003

Prepared by:

AKRF, Inc.
440 Park Avenue South, 7th Floor
New York, New York 10016
(212) 696-0670

DECEMBER 2024

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1.0 INTRODUCTION

1.1 Purpose

This Health and Safety Plan (HASP) was prepared by AKRF, Inc. (AKRF) on behalf of 272 4th Avenue LLC and 538 Caroll Street Borrower LLC (the Volunteers) for the 272 4th Avenue Brownfield Cleanup Program (BCP) site located in the Gowanus neighborhood of Brooklyn, New York (hereinafter referred to as the Site). The Site is an approximately 0.347-acre parcel identified on the New York City Tax Map as Block 456, Lot 13 (formerly Lots 13, 17, and 23). Figure 1 shows the Site location.

The Site was remediated to Track 2 and/or Track 4 New York State Department of Environmental Conservation (NYSDEC) Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs) and/or Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) for petroleum-related volatile organic compounds (VOCs) in accordance with the July 2022 NYSDEC-approved Remedial Action Work Plan (RAWP) and Decision Document. A Site Management Plan (SMP) was prepared to manage remaining contamination at the Site, as required by the Environmental Easement. The Environmental Easement is an Institutional Control (IC) restricting the type of use at the Site after completion of the remedial program under the RAWP. Details on the Site environmental history and remedial activities performed under the RAWP are provided in the SMP.

Engineering Controls (ECs) have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. The following ECs were installed at the Site: (1) a site-wide cover system; and (2) an active sub-slab depressurization system (SSDS). An Environmental Easement granted to NYSDEC and recorded with the Kings County Office of the City Register requires compliance with the SMP, and all ECs and ICs placed on the Site.

The ICs place restrictions on Site use and mandate operation, maintenance, monitoring, and reporting measures for all ECs and ICs. The SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that may remain at the Site. The SMP has been approved by NYSDEC, and compliance with the plan is required by the grantor of the Environmental Easement and the grantor’s successors and assigns. The SMP may be revised only with the approval of NYSDEC.

This HASP, which is an appendix to the SMP, details the procedures required to manage known or potential residual contamination following completion of the Remedial Action at the Site. The purpose of this HASP is to assign responsibilities, establish personnel protection standards and mandatory safety practices and procedures, and provide contingency plans for situations that may arise during site management inspections, operation and maintenance (O&M), periodic sampling activities, and any soil/fill disturbance activities conducted at the Site. This HASP takes into account the specific hazards inherent to the Site, and presents procedures to be followed by AKRF and contractors to avoid, and if necessary protect against, health and/or safety hazards. Application of this HASP should be considered on a task-by-task basis, as not all measures are applicable or necessary for all activities on-site. On-site work activities should comply with applicable parts of the United States Occupational Safety and Health Administration (OSHA) regulations, primarily 29 Code of Federal Regulations (CFR) Parts 1910 and 1926. A copy of this HASP will be maintained on-site during all work performed under the SMP.

All workers who participate in remediation-related activities at the Site that are under the direction of AKRF and/or the Site owner are required to comply with the provisions specified in this HASP. All Site visitors who enter designated work zones must also comply with this HASP. Refusal or failure to comply with this HASP or violation of any safety procedures by field personnel and/or subcontractors performing work covered by this HASP may result in immediate removal from the Site following consultation with the Site owner's representative. No personnel are permitted to enter permit confined spaces under this HASP.

1.2 Scope

This HASP has been developed to address health and safety concerns during Site O&M, monitoring, and inspections after completion of the Site remedy, under the direction of AKRF and any of AKRF's subcontractor(s), as specified in the SMP. On-site work anticipated under the SMP includes the following tasks:

- Assessing achievement of the remedial performance criteria (e.g., inspections of the SSDS and the site-wide cover system);
- Sampling and analysis of appropriate media (e.g., groundwater, soil vapor, and/or indoor air); and
- O&M of the ECs (SSDS and site-wide cover system), which may include disturbance and handling of Site soil/fill.

1.3 Application

This HASP applies to all personnel involved in the above tasks under the direction of the Site owner or AKRF, or those who wish to gain access to active intrusive work areas, including:

- Owner's representatives, contractors, and subcontractors performing tasks under the direction of AKRF, the owner, and/or the owner's representative;
- Federal, state, or local representatives;
- AKRF personnel; and
- AKRF's subcontractors and their employees.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the project team's project organization.

2.1 Remedial Engineer

Ms. Rebecca A. Kinal, P.E. will serve as the Remedial Engineer (RE) under the SMP. As the RE, Ms. Kinal will oversee O&M of ECs under the SMP.

2.2 Site Manager

The SM will be Mr. Michael Bates of AKRF. The SM's responsibilities include the following:

- Manage day-to-day implementation of the site safety measures specified in this HASP;
- Ensure that adequate communication between field crews, health and safety monitoring personnel, and emergency response personnel is maintained;
- Confirm that the Site's field personnel are adequately trained and qualified to work at the Site and that proper personal protective equipment (PPE) is utilized by field teams;
- Investigate and report all accidents/incidents to the RE, PD, and PESM;
- Conduct and document periodic safety briefings;
- Stop work if necessary based on health and safety monitoring;
- Act as the primary point of contact for Site-related activities and coordinate with project personnel;
- Identify operational changes that require potential modifications to health and safety procedures and Site safety plans, and reports such changes to the RE, PD, and PESM;
- Conduct health and safety monitoring activities;
- Determine upgrades or downgrades of PPE based on Site conditions and/or real-time monitoring results;
- Ensure that monitoring instruments are calibrated; and
- Report summaries of field operations and progress to the PD and PESM.

2.3 Project Environmental and Safety Manager

The PESM will be Mr. Patrick Diggins of AKRF. The PESM is a qualified health and safety professional with experience in hazardous waste site remediation activities. The PESM's responsibilities include the following:

- Provide for the development and approval of the HASP;
- Serve as the primary contact to review health and safety matters that may arise;
- Approve revised or new safety protocols for field operations;
- Coordinate revisions of this HASP with field personnel;
- Coordinate upgrading or downgrading of PPE with the SM;
- Assist in the investigation of all accidents/incidents; and
- Enforce work stoppage following reporting of on-site activities from the RE, PD, and SM.

2.4 QA/QC Manager

The QA/QC Manager will be Mr. Marc Godick of AKRF. Mr. Godick's responsibilities include the following:

- Plan, schedule, and manage implementation of remediation activities;
- Coordinate with the Site Manager (SM), Site Supervisor (SS), and Project Environmental Safety Manager (PESM) to ensure that health and safety requirements are met;
- Ensure that field work is scheduled with adequate personnel and equipment resources to complete the job safely and enforce Site health and safety rules;
- Conduct periodic inspections;
- Participate in incident investigations;
- Ensure this HASP has all of the required approvals before any Site work is conducted;
- Ensure that the SM is informed of project changes that require modifications to this HASP; and
- Assume overall responsibility for project health and safety.

2.5 Site Supervisor

The SS will be appointed by the owner's contractor. If work is being performed solely by AKRF, the SS tasks would be performed by the SM (Section 2.3). The SS's responsibilities include the following:

- Provide for the necessary training of field crews in accordance with OSHA regulations and provide proof of training to the SM prior to the crew entering the Site;
- Conduct routine safety inspections of work areas at the Site;
- Conduct incident investigations and, together with the SM, prepare appropriate reports;
- Enforce health and safety rules and compliance with this HASP; and
- Plan field work using appropriate safe procedures and equipment.

2.6 Site Personnel

The responsibilities of Site Personnel include the following:

- Report any unsafe or potentially hazardous conditions to the SM;
- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP;
- Comply with the rules, regulations, and procedures set forth in this HASP and any revisions;
- Prevent unauthorized personnel from entering work sites; and
- Inspect all tools and equipment, including PPE, prior to use.

3.0 SITE HISTORY AND BACKGROUND

Historical records, including Sanborn maps and a city directory search, indicated that former Lot 23 had numerous historical automotive uses, with some commercial and residential uses. The Site was developed as a bottle factory with a stable around 1906. Between 1926 and the 2022, former Lot 23 was used for automobile uses, including a gasoline filling station, a dealership, and an automobile service and repair facility. Former Lot 17 was originally developed as part of a bottle manufacturing facility around 1906. By 1926, former Lot 17 contained a single-story structure used by a wheelwright, and by 1951, the lot was an automobile garage. Around 1965, former Lot 17 was part of a machine shop, and around 1978, it appeared to be an office. Former Lot 13 was developed with a stone yard with a single-story shed around 1926. By 1951, the lot was depicted as a metal and wood finishing facility, and around 1965, former Lot 13 was depicted as an automobile repair facility. Around 1978 the lot was used for unspecified manufacturing uses. Former Lot 13 was also listed with the following uses between 1927 and 2017: automobile repair, steam equipment manufacturing, appliance manufacturing, and janitorial supplies sales.

The Site now consists of a multi-story mixed use commercial and residential building, which is currently under construction.

Between September 2023 and April 2024, the Site was remediated in accordance with the NYSDEC-approved RAWP. The remedial elements performed consisted of the following:

- Soil/fill was excavated and removed from the Site to achieve a combination Track 2 and Track 4 remedy. Remedial excavation extended to varying depths from approximately 2 feet below ground surface (bgs) to 17 feet bgs across the Site, and included:
    a. Excavation to between 2 and 12 feet bgs in the Track 4 area to remove source material, including petroleum-contaminated soil identified during implementation of the RAWP along the eastern Site boundary and in the western portion of the Site associated with eight (8) previously unknown underground storage tanks (USTs) discovered during remedial excavation; and
    b. Excavation ranging from a depth of approximately 13 to 17 feet bgs in the Track 2 area, which included material from the area of the partial cellar and groundwater treatment area to remove petroleum-contaminated source material associated with NYSDEC Spill No. 2005727.
- A groundwater treatment program consisting of application and mechanical mixing of Regenesis Oxygen Release Compound® (ORC) was performed to address residual soil and groundwater contamination associated with NYSDEC Spill No. 2005727. Three permanent groundwater wells were subsequently installed as part of a groundwater monitoring program.
- A vapor mitigation system, consisting of the sub-slab piping for the active SSDS and a minimum 0.20-mil vapor barrier, was installed beneath the new building slab and cellar walls to mitigate potential soil vapor intrusion.
- Site-wide dewatering was implemented in accordance with all federal, state, and local regulations, as necessary, to enable the remedial excavation activities.
- A Community Air Monitoring Plan (CAMP) was implemented during all intrusive Site activities to monitor levels of VOCs and particulates within the active work-zones and around the perimeter of the Site.
- During any intrusive Site work, screening was conducted for indications of soil contamination [i.e., by visual means, odor, and monitoring with photoionization detector (PID)].
- Appropriate off-site disposal of all materials removed from the Site was performed in accordance with all federal, state, and local rules and regulations for handling, transport, and disposal. Waste disposal

facilities were selected based on waste classification sampling and data collected prior to the Remedial Action.

- Importation of fill meeting the requirements of 6 New York Codes, Rules, and Regulations (NYCRR) Part 375-6.7(d) was used to replace excavated soil and/or establish the designed grades beneath the site-wide building slabs.
- Forty-four (44) documentation samples were collected across the Site and analyzed to evaluate the performance of the remedy with respect to attainment of RRSCOs and/or PGWSCOs (VOCs only). Documentation sample frequency was based on the sampling frequency outlined in Section 5.4 of DER-10.
- A composite cover system consisting of minimum six-inch concrete building slabs or a minimum 2-foot-thick, clean soil cover in landscaped areas was constructed in the Track 4 area of the Site.
- Flood prevention measures were deployed at the Site during rain events to prevent soil/fill from exiting the Site during neighborhood-wide flash flood events.
- An Environmental Easement was executed and recorded to restrict land use and prevent future exposure to any contamination remaining at the Site.
- An SMP was developed and implemented for long-term management of remaining contamination, as required by the Environmental Easement. The SMP includes plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting.

4.0 POTENTIAL HAZARDS AT THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered at the Site.

4.1 Hazard Potential

The remediation has been completed; however, some residual contamination remains in the Site subsurface. Exposure to residual contamination is being prevented by the Site-wide cover system, which is designed to remain intact long term. Disturbance of the site-wide cover system or SSDS without prior NYSDEC approval is prohibited by the Environmental Easement. In the unlikely event of an unanticipated, accidental, or required disturbance of the cover system, or if any cracks or openings in the floor occur, they shall be properly sealed immediately and NYSDEC or its successor agency shall be notified.

4.2 Properties of Chemical Contamination

4.2.1 Chemical Hazards in Soil/Fill, Groundwater, and/or Soil Vapor

Potential chemical pathways that may be encountered include: dermal contact, inhalation, and/or ingestion hazards associated with contaminated soil/fill, groundwater, and/or soil vapor.

The potential health effects from on-site contamination are summarized in Table 1 and detailed in the United States Department of Health and Human Services Agency for Toxic Substances and Disease Registry (ATSDR) fact sheets attached in Appendix A.

Table 1
Potential Health Effects from Remaining On-Site Contamination

Chemicals	REL/PEL/STEL	Health Hazards
Arsenic	REL = 0.002 mg/m^3 PEL = TWA 0.010 mg/m^3	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, potential occupational carcinogen
Barium	PEL = 0.5 mg/m^3 REL = 0.5 mg/m^3	Irritation eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse, extrasystoles; hypokalemia.
Benzene	REL = TWA 0.1 ppm PEL = TWA 1 ppm	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression.
Cadmium	PEL = TWA 0.005 mg/m^3	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen].
Chloroform	REL = 2 ppm PEL = 50 ppm	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen].
Chromium	TWA = 1 mg/mg^3	Irritation eyes, skin; lung fibrosis (histologic)
Copper	REL = 1 mg/m^3 PEL = 1 mg/m^3	Irritation eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis; in animals: lung, liver, kidney damage; anemia
Ethyl Benzene	REL = TWA 100 ppm PEL = TWA 100 ppm	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma.
Lead	REL = 0.05 mg/m^3 PEL = 0.05 mg/m^3	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension.

Chemicals	REL/PEL/STEL	Health Hazards
Manganese	REL = 1 mg/m^3 PEL = 0.2 mg/m^3	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage.
Methylene Chloride	PEL = TWA 25 ppm	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numb, tingle limbs; nausea.
Methyl Ethyl Ketone (2-Butanone)	REL = TWA 200 ppm PEL = TWA 200 ppm	Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis.
Mercury	REL = 0.1 mg/m^3 PEL = 0.05 mg/m^3	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria.
Naphthalene	REL = TWA 10 ppm PEL = TWA 10 ppm	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage.
Nickel	REL = TWA 0.015 mg/m^3 PEL = TWA 1 mg/m^3	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen].
Phenol	REL = TWA 5 ppm (19 mg/m^3) [skin] PEL = TWA 5 ppm (19 mg/m^3) [skin]	Irritation eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine; cyanosis; liver, kidney damage; skin burns; dermatitis; ochronosis; tremor, convulsions, twitching
Polycyclic Aromatic Hydrocarbons (PAHs)	PEL = 5 mg/m^3	Harmful effects to skin, bodily fluids, and ability to fight disease, reproductive problems; potential carcinogen.
Selenium	REL = TWA 0.2 mg/m^3 PEL = TWA 0.2 mg/m^3	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns
Silver	REL = TWA 0.01 mg/m^3 PEL = TWA 0.01 mg/m^3	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance.
Toluene	PEL = TWA 200 ppm (750 mg/m^3)	Central nervous system depression, causing fatigue, headache, confusion, paresthesia, dizziness, and muscular incoordination, irritation of the eyes, mucous membranes, and upper respiratory tract.
Tetrachloroethylene (PCE)	PEL: 100 ppm PEL C: 200 ppm; max peak: 300 ppm	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen].
Trichloroethylene (TCE)	PEL = TWA 100 ppm	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen].
Xylenes	REL = TWA 435 mg/m^3 PEL = TWA 435 mg/m^3	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis
Zinc	REL = TWA 5 mg/m^3 PEL = TWA 5 mg/m^3	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function.
Comments: REL = National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit PEL = OSHA Permissible Exposure Limit STEL = OSHA Short Term Exposure Limit TWA = Time-Weighted Average		

4.2.2 Other Chemical Hazards

Although not anticipated, chemicals not identified in this HASP may be used or encountered during Site work. Prior to the initiation of site management tasks, ATSDR Fact Sheets will be obtained for each of the chemicals to be used and all Site workers and visitors who may potentially be exposed will be made aware of the hazards.

4.3 Physical Hazards

Physical hazards will be addressed as necessary. More detailed safety procedures are provided as appendices to this HASP, where applicable.

4.3.1 Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench/immersion foot, and hypothermia, as well as slippery surfaces and brittle equipment. A Cold Stress Program is provided as Appendix B.

4.3.2 Heat Stress

Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke. A heat stress prevention program will be implemented when ambient temperatures exceed 70 ºF for personnel wearing impermeable clothing. A Heath Stress Program is provided as Appendix C.

4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps, and generators. Operations that require the use of hearing protection include operation of heavy equipment, generators, jackhammers, chain saws, sheetpile drivers, dewatering equipment, and pressure washers. Site workers who will perform suspected high noise tasks and operations will be provided with earplugs. Workers not performing those tasks but working in close proximity to that equipment will also be required to wear hearing protection. If deemed necessary by the SM, the PESM will be consulted on the need for additional hearing protection and the need to monitor sound levels for Site activities.

4.3.4 Hand and Power Tools

To complete the various tasks for the proposed scope of work, personnel may be required to use hand and/or power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Work gloves, safety glasses, and hard hats will be worn by the operating personnel at all times when using hand and power tools, and ground fault interrupter (GFI)-equipped circuits will be used for all power tools.

4.3.5 Slips, Trips, and Falls

Working in and around the Site will pose slip, trip, and fall hazards due to slippery surfaces that may be oil covered, or from surfaces that are wet from rain or ice. Excavation at the Site will cause uneven footing in the trenches and around the soil piles. Care should be exercised when walking at the Site, especially when carrying equipment.

4.3.6 Fire and Explosion

The use of cutting/grinding tools, which may spark in the vicinity of flammable building materials, or use of gasoline- or diesel-powered instruments, could present the possibility of encountering fire and explosion hazards. Care should be exercised and fire extinguishers available during any work that presents a fire or explosion hazard.

4.3.7 Manual Lifting

Manual lifting of heavy objects, such as sections of pipe or blower supplies, may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers will be instructed to use power equipment to lift heavy loads whenever possible and to evaluate loads before trying to lift them (i.e., they should be able to easily tip the load and then return it to its original position). Heavy loads should be carried with a buddy and the following proper lifting techniques will be stressed: 1) make sure footing is solid, 2) make back straight with no curving or slouching, 3) center body over feet, 4) grasp the object firmly and as close to your body as possible, 5) lift with legs, and 6) turn with your feet, don’t twist. Back injuries are a serious concern as they are the most common workplace injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

4.3.8 Utilities (Electrocution and Fire Hazards)

Underground utilities at the Site pose fire, explosion, and electrocution hazards. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death. Underground utilities, facilities, equipment, and structures will be located prior to the start of any intrusive activities. The Underground Utilities Call Center will be notified a minimum of three days before any subsurface disturbance. Care shall be exercised to avoid damage to utilities beneath the surface slab. As-builts will be consulted and a geophysical survey shall be completed, if needed.

4.4 Task Hazard Analysis

The scope of work described in Section 1.2 will be accomplished with the following tasks:

1. Mobilization/Demobilization: mobilize equipment and establish Site security, work zones, and staging areas.
2. Site Preparation: locate utilities, construct decontamination pad, and construct negative pressure environmental enclosure around excavation area, if required.
3. Sampling: use appropriate PPE (e.g., nitrile gloves, safety glasses, ear plugs, hard hats).
4. Soil/Fill Excavation and Loading: in the event that soil/fill removal is necessary, remove floor slab in designated area, excavate material and segregate dissimilar materials, load dump trucks or drums, decontaminate heavy equipment, and backfill excavations.
5. Site Restoration Activities: restore flooring in excavation area and any damaged adjacent floors/walls to original condition.

All of these tasks include the potential for chemical and physical hazards, and care should be taken within the work zone to avoid these hazards, as described above. There is a higher potential for chemical hazards to occur during activities that involve the removal and handling of contaminated material; however, exposure to vapors may occur to a lesser degree as soon as the top concrete slab is removed. All tasks should be conducted using the appropriate PPE for the associated exposure, as described in Section 6.0.

5.0 PROCESS SAFETY MANAGEMENT

Process safety management is a systematic way of identifying the potential health and safety hazards associated with major phases of work on a project, and the methods to avoid, control, and mitigate those hazards. Process safety management guidelines will be developed for all activities as necessary, prior to start-up. Process safety management will be used to train work crews in proper safety procedures during phase preparatory meetings.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The PPE required for various remediation tasks is based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER), Appendix B, “General Description and Discussion of the Levels of Protection and Protective Gear.” All on-site personnel shall wear, at a minimum, Level D PPE when performing site management tasks. The protection will be based on the air monitoring described in Section 7.0. Table 2 lists the required PPE for the anticipated site management tasks:

Table 2
Personal Protective Equipment Selection

Level of Protection and PPE Required		**Work Conditions**
Level D (x) Steel Toe Boots (x) Hard Hat (as needed) (x) Work Gloves (as needed) (x) Reflective Vest (as needed)	(x) Safety Glasses or Face Shield (x) Ear Plugs (as needed) (x) Latex or nitrile Gloves (as needed)	All activities except those noted under Levels D modified and C
Level D – Modified ***(in addition to Level D)*** (x) Nitrile Gloves (x) Overboots	(x) Tyvek Coveralls (as needed) -or- (x) Saranex/Polyethylene-coated Tyvek Coveralls (as needed)	Activities with potential for contact with grossly contaminated material
Level C – ***(in addition to Level D – Modified)*** (x) Half-Face Respirator ( ) Full Face Respirator ( ) Full-Face PAPR	( ) Particulate Cartridge (P100) ( ) Organic Cartridge (x) Dual Organic/Particulate Cartridge	If PID > 10 ppm, and/or If PM_{10} > 5.0 mg/m^3
Level C - Modified ***(in addition to Level D – Modified)*** ( ) Half-Face Respirator (x) Full Face Respirator ( ) Full-Face PAPR	( ) Particulate Cartridge (P100) ( ) Organic Cartridge (x) Dual Organic/Particulate Cartridge	If PID > 50 ppm, or If eye irritation occurs
Notes: mg/m^3 = milligrams per cubic meter ppm = parts per million Vapor (PID) and particulate (PM_{10}) measurements are work zone action levels sustained for 15 minutes or greater.		

The PPE specified in Table 2 reflects the hazard analysis presented in Section 4.0 and PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the PESM and SM are considered competent persons. The signatures in this HASP constitute certification of the hazard assessment. For any activities not covered by Table 2, the SM will conduct the hazard assessment and select the appropriate required PPE in consultation with the PESM.

6.1 OSHA Requirements for PPE

All PPE used must meet the OSHA standards presented in Table 3.

Table 3
Personal Protective Equipment OSHA Standards

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1 1968
Respiratory	29 CFR 1910.134	ANSI Z88.1 1980
Head	29 CFR 1910.135	ANSI Z89.1 1969
Foot	29 CFR 1910.136	ANSI Z41.1 1967

Note:
CFR = Code of Federal Regulations
ANSI = American National Standards Institute

7.0 AIR MONITORING

Environmental health and safety monitoring will be performed during all soil disturbance activities in accordance with the CAMP, which is also included in Appendix F of the SMP.

8.0 ZONES, PROTECTION, AND COMMUNICATION

8.1 Site Control

Site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized and will include: an Exclusion Zone (EZ), a Contamination Reduction Zone (CRZ), and a Support Zone (SZ). These zones will be established prior to beginning work for each task requiring such delineation (i.e., intrusive work beneath the Site cover or handling of contaminated materials). For larger scale subgrade work, the work zones will be sketched out and maps delineating the various work zones will be available at the Site and used during initial Site-specific training.

All work will be conducted under the requirements of 29 CFR 1910.120, and any personnel working in an area where the potential for exposure to Site contaminants exists will only be allowed access after proper training and medical documentation is provided to the SM. These records will be maintained by the SM and copies should be provided to the SM prior to mobilization for project activities.

The following will be used for guidance in revising these preliminary zone designations, if necessary:

- The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.
- The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable hand-held equipment, tools, and heavy equipment. A personnel decontamination area will be prepared at each EZ. The CRZ will be used for EZ entry and egress in addition to access for heavy equipment and emergency support services.
- An EZ includes any area that may involve exposure to Site contaminants and hazardous materials and/or conditions. These zones will be clearly delineated by cones, tape, or other means. The SM may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the SM, allowing adequate space for field members, emergency equipment, and the activity to be completed.

8.2 Contamination Control

8.2.1 Personnel Decontamination Station

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

8.2.2 Minimization of Contact with Contaminants

During completion of all Site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during Site activities. All personnel should minimize physical contact with contamination to ultimately minimize the degree of decontamination required and the generation of waste materials from Site operations.

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

8.2.3 Personnel Decontamination Sequence

Consideration will be given to prevailing wind directions so that the decontamination line, the SZ, and the CRZ exit are upwind from the EZ. Decontamination will be performed by removing all PPE used in the EZ and placing it in drums/trash cans within the CRZ. Baby wipes will be available for washing hands and face after PPE removal. In addition, brushes will be available for removing soil/fill from boots.

8.2.4 Emergency Decontamination

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination and wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

If the injured person can be moved, he/she will be moved to the EZ boundary and decontaminated by Site personnel, as previously described, before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury), provisions shall be made to ensure that emergency response personnel will be able to respond to the victim without being exposed to potentially hazardous atmospheric conditions. If the potential for inhalation hazards exists, such as with an open excavation, this area will be covered with poly sheeting to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition and potential contaminants and provided with all pertinent chemical data.

8.2.5 Heavy Equipment Decontamination

Decontamination of chemically contaminated heavy equipment will be accomplished using high-pressure steam or dry decontamination with brushes and shovels. Decontamination shall take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Vehicles or equipment brought into an EZ will be treated as contaminated and will be decontaminated prior to removal. All liquids used in the decontamination procedure will be collected, stored, and disposed of in accordance with federal, state, and local regulations. Personnel performing these tasks will wear the proper PPE, as described in Table 2.

8.3 Communications

The following communications equipment shall be specified as appropriate:

- Telephones - A cellular telephone will be located in the SZ for communication with emergency support services/facilities and the home office. Personnel in the EZ can carry cellular telephones for communication as well if Level D PPE has been determined to be appropriate.
- Hand Signals - Hand signals shall be used by field teams along with the buddy system. They shall be known by the entire field team before operations commence and their use covered during Site-specific training. Typical hand signals are described in Table 4.

Table 4
Hand Signals

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

9.0 MEDICAL SURVEILLANCE PROCEDURES

All personnel performing field work at the Site where potential exposure to contaminants exists are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f) and, where applicable, expanded health standards.

9.1 Medical Surveillance Requirements

A physician's medical release for work will be confirmed by the SM before a worker can enter the EZ. The medical release shall consider the type of work to be performed and the required PPE. The examination will be conducted annually at a minimum. Additional medical testing may be required by the PESM in consultation with the SM if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other Site conditions warrant further medical surveillance.

10.0 SAFETY CONSIDERATIONS

10.1 Excavation and Trenching

The safety requirements for each excavation must be determined by a competent person who is capable of identifying existing and predictable hazards and work conditions that are unsanitary, hazardous, or dangerous to employees. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of any excavation activity, the location of underground utilities, obstructions, etc. will be determined. The New York State One-Call Center will be contacted by the excavation subcontractor a minimum of 72 hours prior to excavation activities.
- All excavations will be inspected daily and after each period of rain by the competent person prior to commencement of work activities. Evidence of cave-ins, slides, sloughing, or surface cracks or excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.
- Excavated and other materials or equipment that could fall or roll into the excavation shall be placed at least 5 feet from the edge of the excavation.
- Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with CFR 1926.652 (b) or (c), except when excavations are less than 5 feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in, or when excavation is made entirely in stable rock.
- Ladders will be positioned no further than 25 feet from any individual working in the trench.

11.0 DISPOSAL PROCEDURES

All discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials (e.g., clothing, gloves, etc.) will be bagged or drummed as necessary, labeled, and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal. The waste management procedures will be conducted in accordance with applicable local, state, and federal regulations.

12.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff are essential. Specific elements of emergency support procedures addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on-site, record keeping, and emergency Site evacuation procedures.

12.1 Responsibilities

12.1.1 Project Environmental and Safety Manager

The PESM is responsible for overseeing and approving the Emergency Response/Contingency Plan and performing audits to determine that the plan is in effect and that all pre-emergency requirements are met. The PESM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 Site Manager

The SM is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The SM is required to immediately notify the PM and PESM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the PESM can notify OSHA within the required time frame. The PESM will be notified within 24 hours of all OSHA recordable injuries, fires, spills, releases, or equipment damage in excess of $500. The SM also serves as the Alternate Emergency Coordinator.

12.1.3 Emergency Coordinator

In the event of an emergency, the Emergency Coordinator shall make contact with local emergency response personnel. In these contacts, the Emergency Coordinator will inform response personnel about the nature of work on the Site, the type of contaminants and associated health or safety effects, and the nature of the emergency, particularly if it is related to exposure to contaminants.

The Emergency Coordinator shall review this plan, verify emergency phone numbers, and identify hospital routes prior to beginning work on-site. The Emergency Coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the Site warrant such action.

12.1.4 Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a Site emergency.

12.2 Communications

A variety of communication systems may be utilized during emergency situations. These are discussed in the following sections.

The primary form of communication during an emergency between field groups in the EZ and the Emergency Coordinator will be verbal communication. During an emergency situation, communication lines will be kept clear so that instructions can be received by all field teams.

12.2.1 Telephone Communications

A cellular telephone will be available on-site.

12.2.2 Hand Signals

Hand signals will be employed by downrange field teams where necessary for communication during emergency situations. Hand signals are presented in Table 4 in Section 8.3.

12.3 Pre-Emergency Planning

Before emergency field activities begin, local emergency response personnel may be notified by the Site owner's representative or contractor of the schedule for field activities and about the materials that are thought to exist on the Site so that they will be able to respond quickly and effectively in the event of a fire, explosion, or other emergency.

To be able to deal with any emergency that might occur during remedial activities at the Site, emergency telephone numbers will be readily available in the SM's vehicle or the Site office. These telephone numbers are presented Section 12.16. The emergency phone numbers listed are preliminary and will be updated as needed prior to the start of work. Immediately prior to mobilization, the SM shall verify all numbers and document any changes in the Site logbook. Hospital route maps will also be readily available in the SM's vehicle and/or the Site office.

12.4 Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the SM immediately. First aid equipment such as a first aid kit and disposable eye washes will be available on-site.

During the Site safety briefing, project personnel will be informed of the location of the first aid station(s) that have been set up. In the case of a medical emergency, the SM will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious (i.e., the person can be moved without expert emergency medical personnel), he/she should be driven to a hospital by on-site personnel. Directions to the hospital are provided in Section 12.15, and a hospital route map is provided in Figure 2. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics before an emergency-response squad arrives at the Site or before the injured person can be transported to the hospital will be followed closely.

12.5 Emergency Site Evacuation Routes and Procedures

In the event of a Site emergency that would require the evacuation of personnel, the Emergency Coordinator will immediately contact the Site owner or owner's representative (this person may or may not be on-site). All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial Site safety meeting. If an emergency occurs at the work area and there is immediate or impending danger, including but not limited to fire, explosion, or significant release of toxic gas into the atmosphere, immediate evacuation of all personnel is necessary. The following evacuation procedures will be used:

- The SM will initiate evacuation procedures by signaling to leave the Site or EZ. The signal for Site evacuation will consist of three long blasts on an air horn.

- All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at a pre-determined meeting location. The designated meeting location for the Site will be at the sidewalk along Jerome Avenue near the front door of the new building.
- All personnel suspected to be in or near the work area should be accounted for and the whereabouts of missing persons determined immediately.
- The SM will then give further instruction.

If any task covered under this HASP has the potential for significant hazards, evacuation drills will be performed as deemed necessary by the SM and PESM.

12.6 Fire Prevention and Protection

In the event of a fire or explosion, the work area will be evacuated immediately and the Emergency Coordinator will notify the local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials;
- Storage of flammable liquids and gases in nonflammable storage cabinets when not in use, away from oxidizers;
- Storage of oxygen at least 25 feet away from acetylene cylinders when not in use. Oxygen and acetylene may not be stored on welding carts;
- No smoking in the EZ or any work area;
- No hot work without a properly executed hot work permit;
- Shutting off engines to refuel;
- Grounding and bonding metal containers during transfer of flammable liquids;
- Use of UL-approved non-flammable storage cans;
- Fire extinguishers rated at least 10 pounds Class A, B, and C located on all heavy equipment, in all trailers, and near all hot work activities; and
- Monthly inspection of all fire extinguishers.

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

12.7 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other specific procedures detailed on the ATSDR Fact Sheets will be followed as necessary. If first aid or emergency medical treatment is necessary, the Emergency Coordinator will contact the appropriate emergency facilities. All chemical exposure incidents must be reported in writing to the PESM. If a member of the field crew demonstrates symptoms of chemical exposure, another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the SM (via voice and hand signals) of the chemical exposure. The SM should contact the appropriate emergency response agency. The procedures outlined in Table 5 should be followed.

Table 5
Chemical Exposure Treatment Procedures

Exposure Pathway	Treatment Procedure
Skin and Eye Contact	Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids, or hydrogen peroxide occurs.
Inhalation	Move to fresh air. Decontaminate and transport to hospital or local medical provider.
Ingestion	Decontaminate and transport to emergency medical facility.
Puncture Wound or Laceration	Decontaminate and transport to emergency medical facility.

12.8 Personal Injury

In case of personal injury at the Site, the following procedures should be followed:

- Another team member (buddy) should signal to the SM that an injury has occurred.
- A field team member trained in first aid can administer treatment to an injured worker.
- If deemed necessary, the victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- The SM or PESM should make certain that an Incident Report Form (provided as Appendix D) is completed. This form is to be submitted to the PESM and SM. Follow-up action should be taken to correct the situation that caused the accident.
- Any incident (near miss, property damage, first aid, medical treatment, etc.) must be reported.

A first aid kit and an eye wash will be kept on-site during the field activities.

12.9 Decontamination During Medical Emergencies

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

12.10 Accident/Incident Reporting

Written confirmation of verbal reports of injuries or other emergencies are to be submitted to the PESM within 24 hours. The Incident Report Form is provided as Appendix D.

In addition to the incident reporting procedures and actions described in this HASP, the SM will coordinate with the owner's representative for reporting and notification for all environmental, safety, and other incidents.

If necessary, a Site safety briefing will be held to discuss accidents/incidents and any findings from the investigation of the incident. This HASP will be modified if deemed necessary by the PESM.

12.11 Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the ATSDR Fact Sheets will be consulted to assist in determining the best means of containment and cleanup. For small spills, absorbent materials such as sand, sawdust, or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed. An EZ of 50-100 feet around the spill area should be established depending on the size and type of the spill.

The following steps should be taken by the Emergency Coordinator:

1. Determine the nature, identity, and amounts of major spill components;
2. Make sure all unnecessary persons are removed from the spill area;
3. Notify appropriate response teams and authorities;
4. Use proper PPE in consultation with the SM;
5. If a flammable liquid, gas, or vapor is involved, remove all ignition sources and use non-sparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
6. If possible, try to stop the leak with appropriate material;
7. Remove all surrounding materials that can react or compound with the spill; and
8. Notify the Site owner and determine who will report the spill to the NYSDEC Spills Hotline, as applicable.

12.12 Emergency Equipment

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

- Industrial first aid kit;
- Portable eye washes;
- Fire extinguishers (one per vehicle); and
- Absorbent material.

12.13 Postings

The following information shall be posted or be readily visible and available at conspicuous locations throughout the Site:

- Emergency telephone numbers; and
- Hospital Route Map (Figure 2).

12.14 Restoration and Salvage

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

- Refilling fire extinguishers;
- Refilling medical supplies;
- Recharging eyewashes and/or showers;
- Replenishing spill control supplies; and
- Replacing used air horns.

12.15 Hospital Directions

The address and directions to the nearest hospital to the Site are provided in Table 6:

Table 6
Hospital Directions

Hospital Name:	New York Methodist Hospital
Phone Number:	718-780-3000
Address:	506 6th Street, Brooklyn, New York 11215
Directions:	1. Leave the Site and turn RIGHT onto 4th Avenue toward Garfield Place. 2. Turn LEFT onto 5th Street. 3. Turn RIGHT onto 7th Avenue. 4. Emergency room will be on the LEFT, on the corner of 6th Street and 7th Avenue.

A map showing the Site evacuation meeting point and driving route to the hospital is provided as Figure 2.

12.16 Emergency Contacts

Table 7
Emergency Contacts

Company	Individual Name	Title	Contact Number
AKRF	Michael Bates	Site Manager	914-355-0693
	J. Patrick Diggins	Project Manager/PESM	914-922-2784
	Marc Godick	QA/QC Manager	914-922-2356
	Rebecca Kinal	Remedial Engineer	914-922-2362
538 Caroll Street Borrower LLC	Jesse Wark	Volunteer Representative	917-826-2847
Ambulance, Fire Department & Police Department	-	-	911
New York State Department of Environmental Conservation	Steven Wu	Project Manager	718-482-6725
New York State Department of Health	James M. Sullivan	Project Manager	518-402-7860
NYSDEC Spill Hotline	-	-	800-457-7362

The emergency contact list will be updated as needed.

13.0 TRAINING

13.1 General Health and Safety Training

In accordance with 29 CFR 1910.120, hazardous waste Site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste Site operations, unless otherwise noted in the standard referenced above. At a minimum, the training will have consisted of instruction in the topics outlined in the standard referenced above. Personnel who have not met the requirements for initial training shall not be allowed to work in any Site activities during which they may be exposed to hazards (chemical or physical). Proof of training shall be submitted to the SM prior to the start of field activities. Other personnel involved in ancillary or support activities, including transportation of material for disposal, shall have the proper training as required by federal, state, and local regulations.

13.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of hazardous waste Site field personnel working in the work zone to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures.

13.3 Supervisor Training

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40-hour training.

13.4 Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the Site operations. The training will cover Site and facility layout, hazards and emergency services, and all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and reinforce their responsibilities regarding safety and operations for their particular activity. The training should include the following topics:

- General requirements of this HASP;
- Review of the scope of work;
- Names of personnel responsible for Site safety and health;
- Potential hazards and acute effects of compounds present at the Site;
- Air monitoring procedures;
- Proper use of PPE;
- Safe use of ECs and equipment on the Site;
- Decontamination procedures; and
- Work practices by which the employee can minimize risk from hazards. This may include a specific review of heavy equipment safety, safety during inclement weather, changes in the escape rendezvous point, Site security measures, or other Site-specific issues that need to be addressed before work begins.

Personnel that have not received Site-specific training will not be allowed in the work zone.

13.5 On-Site Safety Briefings

Project personnel working in designated work zones on-site will be given health and safety briefings periodically by the SM to assist in safely conducting their work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the Site's environmental conditions, and periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity to periodically update the crews on monitoring results.

14.0 LOGS, REPORTS, AND RECORD KEEPING

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

14.1 Medical and Training Records

Copies or verification of training (40-hour, 8-hour, supervisor, and Site-specific training) and medical clearance for hazardous waste Site work and respirator use will be maintained by the SM.

14.2 On-Site Log

A log of personnel on-site each day will be kept by the SM in a field logbook.

14.3 Exposure Records

The SM will periodically notify the PESM of exposure monitoring results that require workers to upgrade to Level C PPE. All personal monitoring results, laboratory reports, calculations, and air sampling data sheets will be maintained by the SM during Site work.

14.4 Accident/Incident Reports

Incident reporting and investigation during Site work will be completed using an Incident Report Form, provided as Appendix D.

14.5 Hazard Communication Program/Agency for Toxic Substances and Disease Registry (ATSDR)

ATSDR Fact Sheets will be obtained for applicable substances and included in the Site hazard communication file. The hazard communication program will be maintained on-site in accordance with 29 CFR 1910.1200.

14.6 Work Permits

All work permits, including lockout/tagout, sidewalk, and debris container permits (if necessary), will be maintained in the project files. Copies of the work permits shall also be provided to the SM and the Site owner's representative.

15.0 FIELD PERSONNEL REVIEW

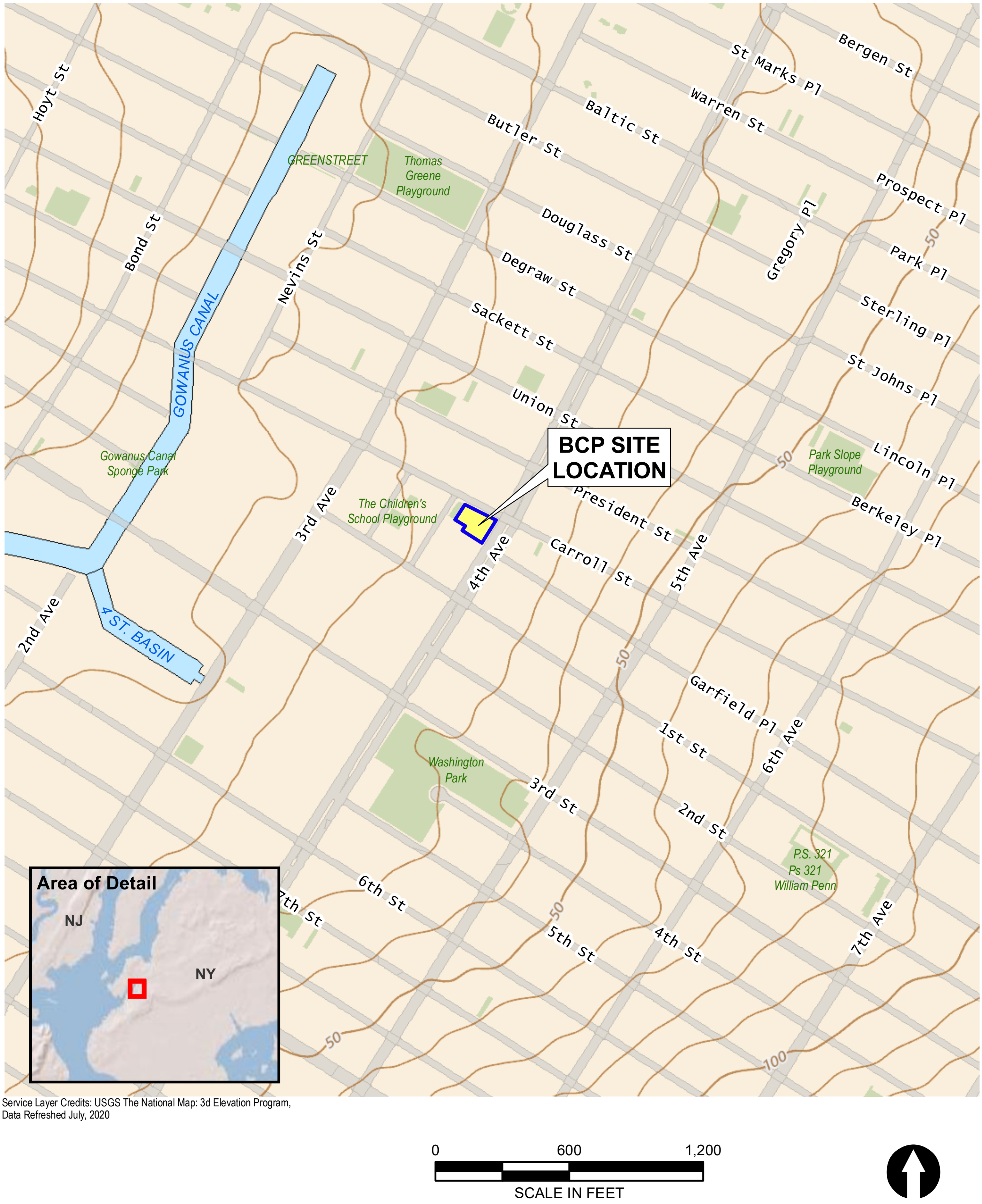
This form serves as documentation that field personnel have read, been informed of, and understand the provisions of this HASP for the Site at 272 4th Avenue in Brooklyn, New York. It will be maintained on-site by the SM as a project record. Each field team member shall sign this section after training in the contents of this HASP has been completed. Site workers must sign this form after Site-specific training is completed and before being permitted to work on-site.

AFFIDAVIT

I have read, or have been informed of, this Health and Safety Plan and understand the information presented. I have also completed Site-specific training for the work detailed in the project specifications. I will comply with the provisions contained therein.

Name (Print and Sign) and Company	Date

FIGURES



Service Layer Credits: USGS The National Map: 3d Elevation Program, Data Refreshed July, 2020

AKRF
440 Park Avenue South, New York, NY 10016

272 4th Ave
Brooklyn, New York

SITE LOCATION

DATE
9/24/2021

PROJECT NO.
190021

FIGURE
1

Service Layer Credits: ESRI World Street Map 2019

New York Methodist Hospital
506 Sixth Street,
Brooklyn, NY
718-780-3000

LEGEND

🟨 BCP SITE (C224298)

◄ ROUTE TO HOSPITAL

✚ HOSPITAL LOCATION

0 500 1,000
SCALE IN FEET

AKRF
440 Park Avenue South, New York, NY 10016

272 4th Ave
Brooklyn, New York

HOSPITAL ROUTE MAP

DATE	**01/10/2021**
PROJECT NO.	**190021**
FIGURE	**2**

©2019 AKRF W:\Projects\190021 - 272 4TH AVENUE\Technical\GIS and Graphics\hazmat\190021 Fig 2 Hospital Route Map.mxd11/22/2019 4:34:28 PM jszalus

APPENDIX A
ATSDR FACT SHEETS

SAFETY DATA SHEET

Revision Date 19-Jan-2018 **Revision Number** 3

1. Identification

Product Name	**n-Butylbenzene**
Cat No. :	**AC107850000; AC107850010; AC107850050; AC107850500; AC107852500**
CAS-No	104-51-8
Synonyms	1-Phenylbutane
Recommended Use	Laboratory chemicals.
Uses advised against	Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 3

Label Elements

Signal Word
Warning

Hazard Statements
Flammable liquid and vapor

Precautionary Statements
Prevention
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store in a well-ventilated place. Keep cool
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Butyl benzene	104-51-8	> 99

4. First-aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
Skin Contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention.
Inhalation	Remove from exposure, lie down. Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
Ingestion	Do NOT induce vomiting. Clean mouth with water. Aspiration hazard. Get medical attention.
Most important symptoms and effects	Difficulty in breathing. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Water spray. Carbon dioxide (CO_2). Dry chemical. Water mist may be used to cool closed containers. Chemical foam.
Unsuitable Extinguishing Media	No information available

Flash Point	59 °C / 138.2 °F
Method -	No information available
Autoignition Temperature	412 °C / 773.6 °F
Explosion Limits	
Upper	5.80%
Lower	.80%
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Combustible material. Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated.

Hazardous Combustion Products
Carbon monoxide (CO). Carbon dioxide (CO_2).
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
0	2	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment as required.
Environmental Precautions	See Section 12 for additional Ecological Information.
Methods for Containment and Clean Up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling	Avoid contact with skin and eyes. Do not breathe dust. Do not breathe mist/vapors/spray. Use spark-proof tools and explosion-proof equipment. Use only non-sparking tools.
Storage	Keep in a dry, cool and well-ventilated place. Refer product specification and/or product label for specific storage temperature requirement. Keep container tightly closed. Keep away from heat, sparks and flame.

8. Exposure controls / personal protection

Exposure Guidelines	This product does not contain any hazardous materials with occupational exposure limitsestablished by the region specific regulatory bodies.
Engineering Measures	Ensure adequate ventilation, especially in confined areas.
Personal Protective Equipment	
Eye/face Protection	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 and body protection	Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection	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.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Odorless
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-88 °C / -126.4 °F
Boiling Point/Range	183 °C / 361.4 °F @ 760 mmHg
Flash Point	59 °C / 138.2 °F
Evaporation Rate	No information available
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	5.80%
Lower	.80%
Vapor Pressure	1.33 hPa @ 23 °C
Vapor Density	4.6
Specific Gravity	0.860
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	412 °C / 773.6 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	$C_{10}H_{14}$
Molecular Weight	134.22

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Keep away from open flames, hot surfaces and sources of ignition. Incompatible products.
Incompatible Materials	Strong oxidizing agents, oxygen
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO_2)
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information	No acute toxicity information is available for this product
Component Information	
Toxicologically Synergistic Products	No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation	No information available
Sensitization	No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Butyl benzene	104-51-8	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Butyl benzene	Group III Chemical	Not applicable	Not applicable

Other Adverse Effects The toxicological properties have not been fully investigated. See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity
Do not empty into drains.

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility .

Component	log Pow
Butyl benzene	4.6

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No	UN2709
Hazard Class	3
Packing Group	III

TDG

UN-No	UN2709
Hazard Class	3
Packing Group	III

IATA

UN-No	UN2709
Proper Shipping Name	BUTYLBENZENES

Hazard Class	3
Packing Group	III

IMDG/IMO

UN-No	UN2709
Proper Shipping Name	BUTYLBENZENES
Hazard Class	3
Packing Group	III

15. Regulatory information

United States of America Inventory

Component	CAS-No	TSCA	TSCA Inventory notification - Active/Inactive	TSCA - EPA Regulatory Flags
Butyl benzene	104-51-8	X	ACTIVE	-

Legend:
TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

Component	CAS-No	DSL	NDSL	EINECS	PICCS	ENCS	AICS	IECSC	KECL
Butyl benzene	104-51-8	X	-	203-209-7	X	X	X	X	-

U.S. Federal Regulations

SARA 313	Not applicable
SARA 311/312 Hazard Categories	See section 2 for more information
CWA (Clean Water Act)	Not applicable
Clean Air Act	Not applicable
OSHA - Occupational Safety and Health Administration	Not applicable
CERCLA	Not applicable
California Proposition 65	This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Butyl benzene	X	X	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ):	N
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade	No information available

16. Other information

Prepared By	Regulatory Affairs Thermo Fisher Scientific Email: EMSDS.RA@thermofisher.com
Revision Date	19-Jan-2018
Print Date	19-Jan-2018
Revision Summary	This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH)

1,2,4-trimethylbenzene

Version number: GHS 2.0
Replaces version of: 25.02.2016 (GHS 1)
Revision: 13.10.2017

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Identification of the substance	**1,2,4-trimethylbenzene**
Registration number (REACH)	01-2119472135-42-xxxx
EC number	202-436-9
Index No	-
CAS number	95-63-6
Additional relevant and available information	Pseudocumene

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	industrial use (SCC)

1.3 Details of the supplier of the safety data sheet

DHC Solvent Chemie GmbH
Timmerhellstraße 28
D-45478 Mülheim an der Ruhr
Germany

Telephone: +49 (208) 9940-0
Telefax: +49 (208) 9940-150

Competent person responsible for the safety data sheet	Vanessa Manz
e-mail (competent person)	productsafety@dhc-solvent.de

1.4 Emergency telephone number

Emergency information service

Poison centre

Country	Telephone
United Kingdom	+44 1235 239670

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Hazard class	Category	Hazard class and category	Hazard statement
flammable liquid	Cat. 3	(Flam. Liq. 3)	H226
acute toxicity (inhal.)	Cat. 4	(Acute Tox. 4)	H332
skin corrosion/irritation	Cat. 2	(Skin Irrit. 2)	H315
serious eye damage/eye irritation	Cat. 2	(Eye Irrit. 2)	H319
specific target organ toxicity - single exposure (respiratory tract irritation)	Cat. 3	(STOT SE 3)	H335
aspiration hazard	Cat. 1	(Asp. Tox. 1)	H304
hazardous to the aquatic environment - chronic hazard	Cat. 2	(Aquatic Chronic 2)	H411

Remarks

For full text of H-phrases: see SECTION 16.
Substance with a community indicative occupational exposure limit value.

The most important adverse physicochemical, human health and environmental effects

May be fatal if swallowed and enters airways.
The product is combustible and can be ignited by potential ignition sources.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal word **Danger**

Pictograms

GHS02, GHS07, GHS08, GHS09

Hazard statements

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statements

Precautionary statements - prevention

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243	Take action to prevent static discharges.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements - response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P331	Do NOT induce vomiting.
P370+P378	In case of fire: Use sand, carbon dioxide or powder extinguisher to extinguish.

Precautionary statements - storage

P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.

Precautionary statements - disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards

According to the results of its assessment, this substance is not a PBT or a vPvB.
Vapour heavier than air, may form an explosive mixture in air: it may be ignited at some distance away from the spill resulting in flashbacks. Flowing product can create electrostatic charge, resulting sparks may ignite or cause an explosion.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Name of substance	1,2,4-trimethylbenzene
Registration number (REACH)	01-2119472135-42-xxxx
EC number	202-436-9
CAS number	95-63-6
Index No	-
Molecular formula	C_9H_{12}

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. Provide fresh air.

Following skin contact

Wash with plenty of soap and water.

Following eye contact

Irrigate copiously with clean, fresh water, holding the eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. In all cases of doubt, or when symptoms persist, seek medical advice.

Following ingestion

Do NOT induce vomiting. Rinse mouth with water (only if the person is conscious).

4.2 Most important symptoms and effects, both acute and delayed

Choking and suffocation risks. Deficits in perception and coordination, reaction time, or sleepiness.

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

carbon dioxide (CO_2), BC-powder, foam, alcohol resistant foam, water mist

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Solvent vapours are heavier than air and may spread along floors. In case of insufficient ventilation and/or in use, may form flammable/explosive vapour-air mixture. May produce toxic fumes of carbon monoxide if burning.

Hazardous combustion products

carbon monoxide (CO), carbon dioxide (CO_2)

5.3 Advice for firefighters

Wear breathing apparatus if exposed to vapours/dust/spray/gases. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance. Keep containers cool with water spray.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety. Avoid inhaling sprayed product. Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Remove/take off immediately all contaminated clothing and wash it before reuse.

For emergency responders

Wear breathing apparatus if exposed to vapours/dust/spray/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.

6.3 Methods and material for containment and cleaning up

Advices on how to contain a spill

Covering of drains.

Advices on how to clean up a spill

Wipe up with absorbent material (e.g. cloth, fleece). Collect spillage (sawdust. , kieselgur (diatomite), sand, universal binder).

Appropriate containment techniques

Use of adsorbent materials. - covering of drains

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Recommendations

• Measures to prevent fire as well as aerosol and dust generation

Use only in well-ventilated areas. Use local and general ventilation. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools.

• Warning

Vapours are heavier than air, spread along floors and form explosive mixtures with air.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

• Explosive atmospheres

Keep container tightly closed and in a well-ventilated place. Use local and general ventilation. Keep cool. Protect from sunlight.

• Flammability hazards

Keep away from sources of ignition - No smoking. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Protect from sunlight.

Incompatible substances or mixtures

Observe hints for combined storage.

Consideration of other advice

• Ventilation requirements

Keep any substance that emits harmful vapours or gases in a place that allows these to be permanently extracted. Use local and general ventilation. Ground/bond container and receiving equipment.

• Packaging compatibilities

Only packagings which are approved (e.g. acc. to ADR) may be used.
Suitable materials and coatings for container/equipment: Carbon Steel, Stainless Steel, Polyester, Polytetrafluoroethylene (PTFE), Polyvinyl Alcohol (PVA)
Unsuitable Materials and Coatings for container/equipment: Butyl Rubber, Natural Rubber, Ethylene-propylene-diene monomer (EPDM), Polystyrene, Polyethylene, Polyacrylonetrile.

7.3 Specific end use(s)

See attached exposure scenarios

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m^3]	STEL [ppm]	STEL [mg/m^3]	Source
DE	1,2,4-trimethylbenzene	95-63-6	AGW	20	100	40	200	TRGS 900
EU	1,2,4-trimethylbenzene	95-63-6	IOELV	20	100			2017/164/EU
GB	aromatics	95-63-6	WEL		500			EH40/2005
IE	1,2,4-trimethylbenzene	95-63-6	OELV	20	100			S.I. No. 619 of 2001

Notation

STEL	Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified.
TWA	Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average.

Relevant DNELs/DMELs/PNECs and other threshold levels

- **human health values**

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	100 mg/m^3	human, inhalatory	worker (industry)	acute - local effects
DNEL	100 mg/m^3	human, inhalatory	worker (industry)	acute - systemic effects
DNEL	100 mg/m^3	human, inhalatory	worker (industry)	chronic - local effects
DNEL	16,171 mg/kg	human, dermal	worker (industry)	chronic - systemic effects
DNEL	100 mg/m^3	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	29.4 mg/m^3	human, inhalatory	consumer (private households)	acute - systemic effects
DNEL	29.4 mg/m^3	human, inhalatory	consumer (private households)	chronic - local effects
DNEL	15 mg/kg	human, oral	consumer (private households)	chronic - systemic effects
DNEL	9,512 mg/kg	human, dermal	consumer (private households)	chronic - systemic effects
DNEL	29.4 mg/m^3	human, inhalatory	consumer (private households)	chronic - systemic effects

- **environmental values**

End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0.12 $^{mg}/_{l}$	aquatic organisms	freshwater	short-term (single instance)
PNEC	0.12 $^{mg}/_{l}$	aquatic organisms	marine water	short-term (single instance)
PNEC	2.41 $^{mg}/_{l}$	microorganisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	13.56 $^{mg}/_{kg}$	benthic organisms	sediments	short-term (single instance)
PNEC	13.56 $^{mg}/_{kg}$	pelagic organisms	sediments	short-term (single instance)
PNEC	2.34 $^{mg}/_{kg}$	terrestrial organisms	soil	short-term (single instance)
PNEC	0.12 $^{mg}/_{l}$	aquatic organisms	water	intermittent release

8.2 Exposure controls

Appropriate engineering controls

Technical measures and the appliance of appropriate working methods take priority over the use of personal protective equipment.
Safety and necessary control measures vary according to exposure conditions. Appropriate measures are:
Open windows, door, to allow sufficient ventilation. If this is not possible employ a fan to increase air exchange (see attached exposure scenarios).

Individual protection measures (personal protective equipment)

Eye/face protection

Use safety goggle with side protection.

Skin protection

- **hand protection**

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374.
Short-term contact with the skin: Disposable gloves
Long-term contact with the skin: Gloves with long cuffs
Check leak-tightness/impermeability prior to use.

- **type of material**

NBR: acrylonitrile-butadiene rubber, FKM: fluoro-elastomer

- **material thickness**

0,40 mm.

- **breakthrough times of the glove material**

>480 minutes (permeation: level 6)

- **other protection measures**

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.
Body protection:
Suitable protective clothing: Flame resistant clothing
Suitable safety shoes: Anti static safety shoes according to EN 345 S3

Respiratory protection

For activities in enclosed areas at elevated temperatures of the substance, local extraction or explosion protected ventilation equipment is recommended. In case this is not sufficient for the intended use, then apply a suitable respiratory protection according to EN 140 type A or better (see exposure scenarios). .

Environmental exposure controls

Do not empty into drains.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	
Physical state	liquid
Colour	colourless
Odour	characteristic
Other physical and chemical parameters	
pH (value)	not determined
Melting point/freezing point	-43.77 °C
Initial boiling point and boiling range	169.4 °C at 101.3 kPa
Flash point	44 °C at 101.3 kPa
Explosive limits	
• lower explosion limit (LEL)	0.9 vol%
• upper explosion limit (UEL)	6.4 vol%
Vapour pressure	0.3 kPa at 25 °C
Density	0.88 $^{g}/_{cm^3}$ at 20 °C
Solubility(ies)	
Water solubility	57 $^{mg}/_{l}$ at 25 °C
Partition coefficient	
n-octanol/water (log KOW)	This information is not available.
Auto-ignition temperature	500 °C
Viscosity	
• kinematic viscosity	0.843 $^{mm^2}/_{s}$ at 20 °C

Explosive properties

in use, may form flammable/explosive vapour-air mixture

Oxidising properties	none

9.2 Other information

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

risk of ignition

• if heated

risk of ignition

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure (see below "Conditions to avoid").

10.3 Possibility of hazardous reactions

No known hazardous reactions.

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Hints to prevent fire or explosion

Use only non-sparking tools.

10.5 Incompatible materials

oxidisers

10.6 Hazardous decomposition products

No known hazardous decomposition products.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Classification according to GHS (1272/2008/EC, CLP)

Acute toxicity

Harmful if inhaled.

• Acute toxicity estimate (ATE)

inhalation: vapour 11 $^{mg}/_{l}$/4h

Exposure route	Endpoint	Value	Species
oral	LD50	6,000 $^{mg}/_{kg}$	rat

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye irritation.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Summary of evaluation of the CMR properties

Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant.

Specific target organ toxicity (STOT)

- **Specific target organ toxicity - single exposure**

May cause respiratory irritation.

- **Specific target organ toxicity - repeated exposure**

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

May be fatal if swallowed and enters airways.

Information on likely routes of exposure

If on skin. If inhaled.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Aquatic toxicity (acute)

Endpoint	Value	Species	Exposure time
LC50	7.72 $^{mg}/_{l}$	fish	96 h
EC50	2.356 $^{mg}/_{l}$	algae	96 h

Aquatic toxicity (chronic)

May cause long-term adverse effects in the aquatic environment.

12.2 Persistence and degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

BCF	243

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

12.6 Other adverse effects

Data are not available.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste treatment-relevant information

Solvent reclamation/regeneration.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

List of wastes

Proposed waste code(s) for the used product:
07 01 04x Other organic solvents, washing liquids and mother liquors

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

SECTION 14: TRANSPORT INFORMATION

14.1	UN number	**1993**
14.2	UN proper shipping name	**FLAMMABLE LIQUID, N.O.S.**
	Technical name	1,2,4-trimethylbenzene
14.3	Transport hazard class(es)	
	Class	3 (flammable liquids)
14.4	Packing group	III (substance presenting low danger)
14.5	Environmental hazards	hazardous to the aquatic environment
14.6	Special precautions for user	

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

The cargo is not intended to be carried in bulk.

Information for each of the UN Model Regulations

• Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)

UN number	1993
Proper shipping name	FLAMMABLE LIQUID, N.O.S.
Technical name (hazardous constituents)	1,2,4-trimethylbenzene
Class	3
Classification code	F1
Packing group	III
Danger label(s)	3 + "fish and tree"

Environmental hazards	yes (hazardous to the aquatic environment)
Special provisions (SP)	274, 601
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 L
Transport category (TC)	3
Tunnel restriction code (TRC)	D/E
Hazard identification No	30
Emergency Action Code	3YE

• International Maritime Dangerous Goods Code (IMDG)

UN number	1993
Proper shipping name	FLAMMABLE LIQUID, N.O.S.
Particulars in the shipper's declaration	UN1993, FLAMMABLE LIQUID, N.O.S., (1,2,4-trimethylbenzene), 3, III, 44 °C c.c., MARINE POLLUTANT
Class	3

Marine pollutant	yes (hazardous to the aquatic environment)
Packing group	III
Danger label(s)	3 + "fish and tree"

Special provisions (SP)	223, 274, 955
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 L
EmS	F-E, S-E
Stowage category	A

- **International Civil Aviation Organization (ICAO-IATA/DGR)**

UN number	1993
Proper shipping name	Flammable liquid, n.o.s.
Class	3
Environmental hazards	yes (hazardous to the aquatic environment)
Packing group	III
Danger label(s)	3

Special provisions (SP)	A3
Excepted quantities (EQ)	E1
Limited quantities (LQ)	10 L

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant provisions of the European Union (EU)

- **Restrictions according to REACH, Annex XVII**

Name of substance	CAS No	Wt%	Type of registration	No
1,2,4-trimethylbenzene		100	1907/2006/EC annex XVII	3
1,2,4-trimethylbenzene		100	1907/2006/EC annex XVII	40

- **List of substances subject to authorisation (REACH, Annex XIV)**

not listed

- **2012/18/EU (Seveso III)**

No	Dangerous substance/hazard categories	Qualifying quantity (tonnes) for the application of lower and upper-tier requirements		Notes
E2	environmental hazards (hazardous to the aquatic environment, cat. 2)	200	500	57)

Notation

57) Hazardous to the Aquatic Environment in category Chronic 2.

• Limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (2004/42/EC, Deco-Paint Directive)

VOC content	100 %

• Directive on industrial emissions (VOCs, 2010/75/EU)

VOC content	100 %

• Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II

not listed

• Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

not listed

• Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)

not listed

National inventories

Country	Inventory	Status
AU	AICS	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed

Legend

AICS	Australian Inventory of Chemical Substances.
CICR	Chemical Inventory and Control Regulation.
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS).
DSL	Domestic Substances List (DSL).
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP).
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China.
INSQ	National Inventory of Chemical Substances.
KECI	Korea Existing Chemicals Inventory.
NZIoC	New Zealand Inventory of Chemicals.
PICCS	Philippine Inventory of Chemicals and Chemical Substances.
REACH Reg.	REACH registered substances.
TCSI	Taiwan Chemical Substance Inventory.
TSCA	Toxic Substance Control Act.

15.2 Chemical Safety Assessment

For this substance a chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

16.1 Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)
1.3	Competent person responsible for the safety data sheet: Christian Knappe	Competent person responsible for the safety data sheet: Vanessa Manz
1.4		Poison centre: change in the listing (table)
2.2		Precautionary statements - prevention: change in the listing (table)
2.2		Precautionary statements - disposal: change in the listing (table)
6.2	Environmental precautions: Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.	Environmental precautions: Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.
8.1		Occupational exposure limit values (Workplace Exposure Limits): change in the listing (table)
11.1		Information on likely routes of exposure: If on skin. If inhaled.
15.1		• Restrictions according to REACH, Annex XVII: change in the listing (table)
15.1		National inventories: change in the listing (table)
16		Abbreviations and acronyms: change in the listing (table)
16	Key literature references and sources for data: - Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU - Regulation (EC) No. 1272/2008 (CLP, EU GHS) - See attached exposure scenarios http://www.dhc-solvent.de/dhc_sdbreach.html http://www.dhc-solvent.de/en/dhc_sdbreach.html Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). International Air Transport Association (IATA).	Key literature references and sources for data: - Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU - Regulation (EC) No. 1272/2008 (CLP, EU GHS) - The exposure scenarios are available at www.dhc-solvent.de in the Service section. Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). International Air Transport Association (IATA).
16		Disclaimer: This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product. The information concerning legal regulations can lay no claim to completeness. In addition to this, other provisions may also apply to the product.

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2017/164/EU	Comission Directive establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
AGW	Workplace exposure limit

Abbr.	Descriptions of used abbreviations
BCF	Bioconcentration factor
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
CMR	Carcinogenic, Mutagenic or toxic for Reproduction
DGR	Dangerous Goods Regulations (see IATA/DGR)
DMEL	Derived Minimal Effect Level
DNEL	Derived No-Effect Level
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-licence/)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
IOELV	Indicative occupational exposure limit value
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
S.I. No. 619 of 2001	Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001
STEL	Short-term exposure limit
TRGS 900	Arbeitsplatzgrenzwerte (TRGS 900)
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

Key literature references and sources for data

- Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU
- Regulation (EC) No. 1272/2008 (CLP, EU GHS)
- The exposure scenarios are available at www.dhc-solvent.de in the Service section.

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN).
International Maritime Dangerous Goods Code (IMDG).
International Air Transport Association (IATA).

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H411	Toxic to aquatic life with long lasting effects.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product. The information concerning legal regulations can lay no claim to completeness. In addition to this, other provisions may also apply to the product.

SIGMA-ALDRICH

sigma-aldrich.com

Material Safety Data Sheet

Version 5.0
Revision Date 12/18/2012
Print Date 11/20/2013

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 1,3,5-Trimethylbenzene solution

Product Number : 41103
Brand : Supelco

Supplier : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555
Preparation Information : Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid, Target Organ Effect, Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption

Target Organs

Eyes, Kidney, Liver, Heart, Central nervous system

GHS Classification
Flammable liquids (Category 2)
Acute toxicity, Oral (Category 3)
Acute toxicity, Inhalation (Category 3)
Acute toxicity, Dermal (Category 3)
Skin irritation (Category 2)
Eye irritation (Category 2A)
Specific target organ toxicity - single exposure (Category 1)

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H301 + H311	Toxic if swallowed or in contact with skin
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H370	Causes damage to organs.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280	Wear protective gloves/ protective clothing.

P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.

HMIS Classification

Health hazard: 2
Chronic Health Hazard: *
Flammability: 3
Physical hazards: 0

NFPA Rating

Health hazard: 2
Fire: 3
Reactivity Hazard: 0

Potential Health Effects

Inhalation	Toxic if inhaled. Causes respiratory tract irritation.
Skin	Toxic if absorbed through skin. Causes skin irritation.
Eyes	Causes eye irritation.
Ingestion	Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Mesitylenesolution

Component		Classification	Concentration
Methanol			
CAS-No.	67-56-1	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	90 - 100 %
EC-No.	200-659-6		
Index-No.	603-001-00-X		
Registration number	01-2119433307-44-XXXX		

For the full text of the H-Statements and R-Phrases mentioned in this Section, see Section 16

4. FIRST AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Conditions of flammability

Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature: 2 - 8 °C

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
Remarks	Headache Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption			
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Headache Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption			
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
	Skin notation			
		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
	Skin notation			
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	The value in mg/m3 is approximate.			
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits

	Potential for dermal absorption			
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
	Potential for dermal absorption			

Personal protective equipment

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	colourless

Safety data

pH	no data available
Melting point/freezing point	Melting point/range: -98 °C (-144 °F)
Boiling point	64 - 65 °C (147 - 149 °F) at 1,013 hPa (760 mmHg)
Flash point	11 °C (52 °F) - closed cup
Ignition temperature	no data available
Auto-ignition temperature	385 °C (725 °F)
Lower explosion limit	6 %(V)
Upper explosion limit	36 %(V)
Vapour pressure	130.23 hPa (97.68 mmHg) at 20 °C (68 °F) 547 hPa (410 mmHg) at 50 °C (122 °F)
Density	0.791 g/cm3
Water solubility	completely miscible
Partition coefficient: n-octanol/water	no data available
Relative vapor density	no data available

Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions

Vapours may form explosive mixture with air.

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

Materials to avoid
Acids, Oxidizing agents, Alkali metals, Strong oxidizing agents, Acid chlorides, Acid anhydrides, Reducing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
Inhalation LC50
Dermal LD50
Other information on acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
Eyes: no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	Toxic if inhaled. Causes respiratory tract irritation.
Ingestion	Toxic if swallowed.
Skin	Toxic if absorbed through skin. Causes skin irritation.
Eyes	Causes eye irritation.

Signs and Symptoms of Exposure
Methyl alcohol may be fatal or cause blindness if swallowed., Cannot be made non-poisonous., Effects due to ingestion may include:, Nausea, Dizziness, Gastrointestinal disturbance, Weakness, Confusion., Drowsiness, Unconsciousness, May cause convulsions.

Synergistic effects
no data available

Additional Information
RTECS: Not available

12. ECOLOGICAL INFORMATION

Toxicity

no data available

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol, solution
Marine Pollutant: No
Poison Inhalation Hazard: No

IMDG

UN number: 1230 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHANOL, SOLUTION
Marine Pollutant: No

IATA
UN number: 1230 Class: 3 (6.1) Packing group: II
Proper shipping name: Methanol, solution

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Target Organ Effect, Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Text of H-code(s) and R-phrase(s) mentioned in Section 3

Acute Tox.	Acute toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H370	Causes damage to organs.
STOT SE	Specific target organ toxicity - single exposure

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

SAFETY DATA SHEET

Creation Date 27-Jan-2010 **Revision Date** 28-Nov-2019 **Revision Number** 7

1. Identification

Product Name	**Methylene chloride**
Cat No. :	**D37-1; D37-4; D37-20; D37-200; D37-200LC; D37-500; D37FB-19; D37FB-50; D37FB-115; D37FB-200; D37POP-19; D37POPB-50; D37POPB-200; D37RB-19; D37RB-50; D37RB-115; D37RB-200; D37RS-19; D37RS-28; D37RS-50; D37RS-115; D37RS-200; D37SK-4; D37SK-4LC; D37SS-28; D37SS-50; D37SS-115; D37SS-200; D37SS-1350; D37RS1000ASME; NC1485726; D37RE200ASME; NC1568702; NC1641358; XXMECLDOW2000; XXMECLDOW200LI**
CAS-No	75-09-2
Synonyms	Dichloromethane; DCM
Recommended Use	Laboratory chemicals.
Uses advised against	. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA:
800-424-9300
CHEMTREC®, Outside the USA:
001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Liver, Kidney, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
Causes skin irritation
Causes serious eye irritation
May cause drowsiness or dizziness
May cause cancer
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Wear eye/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Response
IF exposed or concerned: Get medical attention/advice
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)

WARNING. Cancer - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Methylene chloride	75-09-2	>99.5

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.
Inhalation	Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.
Ingestion	Clean mouth with water and drink afterwards plenty of water.
Most important symptoms and effects	. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Causes central nervous system depression: Continued or high exposures by inhalation will cause anaesthetic effects. This may result in a loss of consciousness and could prove fatal: Causes formation of carbon monoxide in the blood. Carbon monoxide may cause adverse effects on the cardiovascular system and the central nervous system
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam.
Unsuitable Extinguishing Media	No information available
Flash Point	No information available
Method -	No information available
Autoignition Temperature	556 °C / 1032.8 °F
Explosion Limits	
Upper	23 vol %
Lower	13 vol %
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

Carbon monoxide (CO) Carbon dioxide (CO_2) Hydrogen chloride gas Phosgene

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	1	0	N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment as required. Ensure adequate ventilation.
Environmental Precautions	Should not be released into the environment.
Methods for Containment and Clean Up	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling	Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Vapors are heavier than air and may spread along floors. Handle product only in closed system or provide appropriate exhaust ventilation. Reacts with aluminum and its alloys.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store in aluminum containers.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Methylene chloride	TWA: 50 ppm	(Vacated) TWA: 500 ppm (Vacated) STEL: 2000 ppm (Vacated) Ceiling: 1000 ppm TWA: 25 ppm STEL: 125 ppm	IDLH: 2300 ppm	TWA: 50 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures	Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection	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 and body protection	Wear appropriate protective gloves and clothing to prevent skin exposure.
Respiratory Protection	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.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	sweet
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-97 °C / -142.6 °F
Boiling Point/Range	39 °C / 102.2 °F
Flash Point	No information available
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	23 vol %
Lower	13 vol %
Vapor Pressure	350 mbar @ 20°C
Vapor Density	2.93 (Air = 1.0)

Specific Gravity	1.33
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	556 °C / 1032.8 °F
Decomposition Temperature	No information available
Viscosity	0.42 mPas @ 25°C
Molecular Formula	C H2 Cl2
Molecular Weight	84.93

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions. Decomposes on exposure to light.
Conditions to Avoid	Excess heat. Protect from direct sunlight.
Incompatible Materials	Strong oxidizing agents, Strong acids, Amines
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO_2), Hydrogen chloride gas, Phosgene
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	Forms a detonable mixture with nitric acid.

11. Toxicological information

Acute Toxicity

Product Information
Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methylene chloride	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rat)	53 mg/L (Rat) 6 h 76000 mg/m^3 (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation	Irritating to eyes and skin
Sensitization	No information available
Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Methylene chloride	75-09-2	Group 2A	Reasonably Anticipated	A3	X	A3

IARC: (International Agency for Research on Cancer)	*IARC: (International Agency for Research on Cancer)* *Group 1 - Carcinogenic to Humans* *Group 2A - Probably Carcinogenic to Humans* *Group 2B - Possibly Carcinogenic to Humans*
NTP: (National Toxicity Program)	*NTP: (National Toxicity Program)* *Known - Known Carcinogen* *Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen*
ACGIH: (American Conference of Governmental Industrial Hygienists)	*A1 - Known Human Carcinogen* *A2 - Suspected Human Carcinogen* *A3 - Animal Carcinogen* *ACGIH: (American Conference of Governmental Industrial Hygienists)*
Mexico - Occupational Exposure Limits - Carcinogens	*Mexico - Occupational Exposure Limits - Carcinogens* *A1 - Confirmed Human Carcinogen* *A2 - Suspected Human Carcinogen* *A3 - Confirmed Animal Carcinogen*

A4 - Not Classifiable as a Human Carcinogen
A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects	Mutagenic effects have occured in microorganisms.
Reproductive Effects	No information available.
Developmental Effects	No information available.
Teratogenicity	No information available.
STOT - single exposure	Central nervous system (CNS)
STOT - repeated exposure	Liver Kidney Blood
Aspiration hazard	No information available
Symptoms / effects,both acute and delayed	Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Causes central nervous system depression: Continued or high exposures by inhalation will cause anaesthetic effects. This may result in a loss of consciousness and could prove fatal: Causes formation of carbon monoxide in the blood. Carbon monoxide may cause adverse effects on the cardiovascular system and the central nervous system
Endocrine Disruptor Information	No information available
Other Adverse Effects	Tumorigenic effects have been reported in experimental animals.

12. Ecological information

Ecotoxicity

.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Methylene chloride	EC50:>660 mg/L/96h	Pimephales promelas: LC50:193 mg/L/96h	EC50: 1 mg/L/24 h EC50: 2.88 mg/L/15 min	EC50: 140 mg/L/48h

Persistence and Degradability	Persistence is unlikely based on information available.
Bioaccumulation/ Accumulation	No information available.
Mobility	Will likely be mobile in the environment due to its volatility.

Component	log Pow
Methylene chloride	1.25

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Methylene chloride - 75-09-2	U080	-

14. Transport information

DOT

UN-No	UN1593
Proper Shipping Name	DICHLOROMETHANE
Hazard Class	6.1
Packing Group	III

TDG

UN-No	UN1593
Proper Shipping Name	DICHLOROMETHANE

Hazard Class	6.1
Packing Group	III

IATA

UN-No	UN1593
Proper Shipping Name	Dichloromethane
Hazard Class	6.1
Packing Group	III

IMDG/IMO

UN-No	UN1593
Proper Shipping Name	Dichloromethane
Hazard Class	6.1
Packing Group	III

15. Regulatory information

United States of America Inventory

Component	CAS-No	TSCA	TSCA Inventory notification - Active/Inactive	TSCA - EPA Regulatory Flags
Methylene chloride	75-09-2	X	ACTIVE	R

Legend:
TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

Section 6(a) of the Toxic Substances Control Act (TSCA)	This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.
TSCA 12(b) - Notices of Export	Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

Component	CAS-No	DSL	NDSL	EINECS	PICCS	ENCS	AICS	IECSC	KECL
Methylene chloride	75-09-2	X	-	200-838-9	X	X	X	X	KE-23893

U.S. Federal Regulations

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Methylene chloride	75-09-2	>99.5	0.1

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Methylene chloride	-	-	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Methylene chloride	X		-

OSHA - Occupational Safety and Health Administration

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Methylene chloride	125 ppm STEL 12.5 ppm Action Level 25 ppm TWA	-

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Methylene chloride	1000 lb 1 lb	-

California Proposition 65 This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Methylene chloride	75-09-2	Carcinogen	200 µg/day 50 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Methylene chloride	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ):	Y
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 27-Jan-2010
Revision Date 28-Nov-2019
Print Date 28-Nov-2019
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

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AGENCY FOR TOXIC SUBSTANCES
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BENZENE
CAS # 71-43-2

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1997**

This fact sheet answers the most frequently asked health questions (FAQs) about benzene. 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.

HIGHLIGHTS: Benzene is a widely used chemical formed from both natural processes and human activities. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia. Benzene has been found in at least 813 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is benzene?
(Pronounced bĕn′zēn′)

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

What happens to benzene when it enters the environment?

- ☐ Industrial processes are the main source of benzene in the environment.
- ☐ Benzene can pass into the air from water and soil.
- ☐ It reacts with other chemicals in the air and breaks down within a few days.
- ☐ Benzene in the air can attach to rain or snow and be carried back down to the ground.
- ☐ It breaks down more slowly in water and soil, and can pass through the soil into underground water.
- ☐ Benzene does not build up in plants or animals.

How might I be exposed to benzene?

- ☐ Outdoor air contains low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles, and industrial emissions.
- ☐ Indoor air generally contains higher levels of benzene from products that contain it such as glues, paints, furniture wax, and detergents.
- ☐ Air around hazardous waste sites or gas stations will contain higher levels of benzene.
- ☐ Leakage from underground storage tanks or from hazardous waste sites containing benzene can result in benzene contamination of well water.
- ☐ People working in industries that make or use benzene may be exposed to the highest levels of it.
- ☐ A major source of benzene exposures is tobacco smoke.

How can benzene affect my health?

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, Public Health Service
Agency for Toxic Substances and Disease Registry

The major effect of benzene from long-term (365 days or longer) exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

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

Several tests can show if you have been exposed to benzene. There is test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood, however, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable indicator of how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum permissible level of benzene in drinking water at 0.005 milligrams per liter (0.005 mgL). The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Chromosomes: Parts of the cells responsible for the development of hereditary characteristics.

Metabolites: Breakdown products of chemicals.

Milligram (mg): One thousandth of a gram.

Pesticide: A substance that kills pests.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Benzene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

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 E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. 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.

irregular heart beat, and some died. Ingestion of high concentrations of phenol has resulted in internal burns and death.

In animals, breathing air with high levels of phenol resulted in irritation of the lungs. Repeated exposures induced muscle tremors and loss of coordination. Exposure to high concentrations of phenol in the air for several weeks caused paralysis and severe injury to the heart, liver, kidneys, and lungs, and in some cases, death. Some animals that drank water with very high concentrations of phenol suffered muscle tremors and loss of coordination.

Phenol can have beneficial effects when used medically as an antiseptic or anesthetic.

How likely is phenol to cause cancer?

The International Agency for Research on Cancer (IARC) and the EPA have determined that phenol is not classifiable as to its carcinogenicity to humans.

How can phenol affect children?

Vomiting and lethargy were the most frequent signs of toxicity observed in children who accidentally ingested phenol and were treated at a poison control center. We do not know whether children would be more sensitive than adults to the effects of phenol.

Phenol has caused minor birth defects and low birth weight in animals generally at exposure levels that also were toxic to the pregnant mothers.

How can families reduce the risks of exposure to phenol?

- Avoiding environmental tobacco smoke, which contains phenol, will reduce phenol exposures.
- Always store household products and over-the-counter medications that contain phenol in their original labeled containers out of the reach of children.

Is there a medical test to determine whether I've been exposed to phenol?

Phenol can be measured in blood and urine. A higher-than-normal concentration of phenol in the urine may suggest recent exposure to phenol or to substances that are converted to phenol in the body.

The detection of phenol and/or its metabolites in your urine cannot be used to predict the kind of health effects that might develop from that exposure.

Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to phenol in drinking water at concentrations of 6 mg/L for up to 10 days is not expected to cause any adverse effects in a child.

The EPA has determined that lifetime exposure to 2 mg/L phenol in drinking water is not expected to cause any adverse effects.

The Occupational Safety and Health Administration (OSHA) has set a limit of 5 parts per million (ppm) of phenol in air to protect workers during 8-hour work shifts.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2008. Toxicological Profile for Phenol. 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 and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

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.

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XYLENE

CAS # 1330-20-7

Division of Toxicology and Environmental Medicine ToxFAQs™ **August 2007**

This fact sheet answers the most frequently asked health questions (FAQs) about xylene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information 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.

HIGHLIGHTS: Exposure to xylene occurs in the workplace and when you use paint, gasoline, paint thinners and other products that contain it. People who breathe high levels may have dizziness, confusion, and a change in their sense of balance. Xylene has been found in at least 840 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is xylene?

There are three forms of xylene in which the methyl groups vary on the benzene ring: *meta*-xylene, *ortho*-xylene, and *para*-xylene (*m*-, *o*-, and *p*-xylene). These different forms are referred to as isomers.

Xylene is a colorless, sweet-smelling liquid that catches on fire easily. It occurs naturally in petroleum and coal tar. Chemical industries produce xylene from petroleum. It is one of the top 30 chemicals produced in the United States in terms of volume.

Xylene is used as a solvent and in the printing, rubber, and leather industries. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. It is found in small amounts in airplane fuel and gasoline.

What happens to xylene when it enters the environment?

- ❏ Xylene evaporates quickly from the soil and surface water into the air.
- ❏ In the air, it is broken down by sunlight into other less harmful chemicals in a couple of days.
- ❏ It is broken down by microorganisms in soil and water.
- ❏ Only a small amount of it builds up in fish, shellfish, plants, and other animals living in xylene-contaminated water.

How might I be exposed to xylene?

- ❏ Using a variety of consumer products including gasoline, paint varnish, shellac, rust preventatives, and cigarette smoke. Xylene can be absorbed through the respiratory tract and through the skin.
- ❏ Ingesting xylene-contaminated food or water, although these levels are likely to be very low.
- ❏ Working in a job that involves the use of xylene such as painters, paint industry workers, biomedical laboratory workers, automobile garage workers, metal workers, and furniture refinishers.

How can xylene affect my health?

No health effects have been noted at the background levels that people are exposed to on a daily basis.

High levels of exposure for short or long periods can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

How likely is xylene to cause cancer?

Both the International Agency for Research on Cancer (IARC) and the EPA have found that there is insufficient information to determine whether or not xylene is carcinogenic.

How can xylene affect children?

The effects of xylene have not been studied in children, but it is likely that they would be similar to those seen in exposed adults. Although there is no direct evidence, children may be more sensitive to acute inhalation exposure than adults because their narrower airways would be more sensitive to swelling effects.

Studies of unborn animals indicate that high concentrations of xylene may cause increased numbers of deaths, and delayed growth and development. In many instances, these same concentrations also cause damage to the mothers. We do not know if xylene harms the unborn child if the mother is exposed to low levels of xylene during pregnancy

How can families reduce the risks of exposure to xylene?

☐ Exposure to xylene as solvents (in paints or gasoline) can be reduced if the products are used with adequate ventilation and if they are stored in tightly closed containers out of the reach of small children.
☐ Sometimes older children sniff household chemicals in attempt to get high. Talk with your children about the dangers of sniffing xylene.
☐ If products containing xylene are spilled on the skin, then the excess should be wiped off and the area cleaned with soap and water.

Is there a medical test to determine whether I've been exposed to xylene?

Laboratory tests can detect xylene or its breakdown products in exhaled air, blood, or urine. There is a high degree of agreement between the levels of exposure to xylene and the levels of xylene breakdown products in the urine. However, a urine sample must be provided very soon after exposure ends because xylene quickly leaves the body. These tests are not routinely available at your doctor's office because they require special equipment.

Has the federal government made recommendations to protect human health?

The EPA set a limit of 10 parts xylene per million parts drinking water (10 ppm).

The Occupational Safety and Health Administration (OSHA) has set limits of 100 parts xylene per million parts of workplace air (100 ppm) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Xylene (Update). Atlanta, GA: U.S. Department of Public 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 and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, 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.

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BARIUM
CAS # 7440-39-3

Division of Toxicology and Human Health Sciences ToxFAQs™ June 2013

This fact sheet answers the most frequently asked health questions (FAQs) about barium and barium compounds. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because these substances 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.

HIGHLIGHTS: Exposure to barium occurs mostly in the workplace or from drinking contaminated water. Ingesting drinking water containing levels of barium above the EPA drinking water guidelines for relatively short periods of time can cause gastrointestinal disturbances and muscle weakness. Ingesting high levels for a long time can damage the kidneys. Barium and barium compounds have been found in at least 798 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is barium?

Barium is a silvery-white metal which exists in nature only in ores containing mixtures of elements. It combines with other chemicals such as sulfur or carbon and oxygen to form barium compounds.

Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, ceramics, glass, and rubber.

Barium sulfate is sometimes used by doctors to perform medical tests and to take x-rays of the gastrointestinal tract.

What happens to barium when it enters the environment?

- Barium gets into the air during the mining, refining, and production of barium compounds, and from the burning of coal and oil.
- The length of time that barium will last in air, land, water, or sediments depends on the form of barium released.
- Barium compounds, such as barium sulfate and barium carbonate, which do not dissolve well in water, can last a long time in the environment.
- Barium compounds, such as barium chloride, barium nitrate, or barium hydroxide, that dissolve easily in water usually do not last in these forms for a long time in the environment. The barium in these compounds that is dissolved in water quickly combines with sulfate or carbonate that are naturally found in water and become the longer lasting forms (barium sulfate and barium carbonate).
- Fish and aquatic organisms can accumulate barium.

How might I be exposed to barium?

- Ingesting small amounts present in your food and water or breathing air containing very low levels of barium.
- Living in areas with unusually high natural levels of barium in the drinking water.
- Working in a job that involves barium production or use.
- Living or working near waste sites where barium has been disposed of.

How can barium affect my health?

The health effects of the different barium compounds depend on how well the compound dissolves in water or in the stomach contents. Barium compounds that do not dissolve well, such as barium sulfate, are not generally harmful.

Barium has been found to potentially cause gastrointestinal disturbances and muscular weakness when people are exposed to it at levels above the EPA drinking water standards for relatively short periods of time. Some people who eat or drink amounts of barium above background levels found in food and water for a short period may experience vomiting, abdominal cramps, diarrhea, difficulties in breathing, increased or decreased blood pressure, numbness around the face, and muscle weakness. Eating or drinking very large amounts of barium compounds that easily dissolve can cause changes in heart rhythm or paralysis and possibly death. Animals that drank barium over long periods had damage to the kidneys, decreases in body weight, and some died.

How likely is barium to cause cancer?

The Department of Health and Human Services (DHHS) and the International Agency for Research on Cancer (IARC) have not classified barium as to its carcinogenicity. The EPA has determined that barium is not likely to be carcinogenic to humans following ingestion and that there is insufficient information to determine whether it will be carcinogenic to humans following inhalation exposure.

How can barium affect children?

We do not know whether children will be more or less sensitive than adults to barium toxicity. A study in rats that swallowed barium found a decrease in newborn body weight; we do not know if a similar effect would be seen in humans.

How can families reduce the risk of exposure to barium?

- ☐ The greatest potential source of barium exposure is through food and drinking water. However, the amount of barium in foods and drinking water are typically too low to be of concern.

Is there a medical test to determine whether I've been exposed to barium?

There is no routine medical test to determine whether you have been exposed to barium. Doctors can measure barium in body tissues and fluids, such as bones, blood, urine, and feces, using very complex instruments. These tests cannot be used to predict the extent of the exposure or potential health effects.

The geometric mean barium level measured in the U.S. general population aged 6 and older is reported by the Centers for Disease Control and Prevention (CDC) as 1.56 µg/g creatinine (measured in urine).

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 2.0 milligrams of barium per liter of drinking water (2.0 mg/L), which is the same as 2 ppm.

The Occupational Safety and Health Administration (OSHA) has set Permissible Exposure Limits (PELs) of 0.5 milligrams of soluble barium compounds per cubic meter of workplace air (0.5 mg/m^3) for 8 hour shifts and 40 hour work weeks. The OSHA limits for barium sulfate dust are 15 mg/m^3 of total dust and 5 mg/m^3 for respirable fraction.

The National Institute for Occupational Safety and Health (NIOSH) has set Recommended Exposure Limits (RELs) of 0.5 mg/m^3 for soluble barium compounds. The NIOSH has set RELs of 10 mg/m^3 (total dust) for barium sulfate and 5 mg/m^3 (respirable fraction).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Barium and Compounds (*Update*). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

http://www.cdc.gov/exposurereport/pdf/FourthReport_UpdatedTables_Sep2012.pdf

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp. 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.

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ETHYLBENZENE
CAS # 100-41-4

Agency for Toxic Substances and Disease Registry ToxFAQs **June 1999**

This fact sheet answers the most frequently asked health questions (FAQs) about ethylbenzene. 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. It's important you understand this information 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.

HIGHLIGHTS: Ethylbenzene is a colorless liquid found in a number of products including gasoline and paints. Breathing very high levels can cause dizziness and throat and eye irritation. Ethylbenzene has been found in at least 731 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ethylbenzene?
(Pronounced ĕth′ əl bĕn′ zēn′)

Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is found in natural products such as coal tar and petroleum and is also found in manufactured products such as inks, insecticides, and paints.

Ethylbenzene is used primarily to make another chemical, styrene. Other uses include as a solvent, in fuels, and to make other chemicals.

What happens to ethylbenzene when it enters the environment?

- ☐ Ethylbenzene moves easily into the air from water and soil.
- ☐ It takes about 3 days for ethylbenzene to be broken down in air into other chemicals.
- ☐ Ethylbenzene may be released to water from industrial discharges or leaking underground storage tanks.
- ☐ In surface water, ethylbenzene breaks down by reacting with other chemicals found naturally in water.
- ☐ In soil, it is broken down by soil bacteria.

How might I be exposed to ethylbenzene?

- ☐ Breathing air containing ethylbenzene, particularly in areas near factories or highways.
- ☐ Drinking contaminated tap water.
- ☐ Working in an industry where ethylbenzene is used or made.
- ☐ Using products containing it, such as gasoline, carpet glues, varnishes, and paints.

How can ethylbenzene affect my health?

Limited information is available on the effects of ethylbenzene on people's health. The available information shows dizziness, throat and eye irritation, tightening of the chest, and a burning sensation in the eyes of people exposed to high levels of ethylbenzene in air.

Animals studies have shown effects on the nervous system, liver, kidneys, and eyes from breathing ethylbenzene in air.

How likely is ethylbenzene to cause cancer?

The EPA has determined that ethylbenzene is not classifiable as to human carcinogenicity.

No studies in people have shown that ethylbenzene exposure can result in cancer. Two available animal studies suggest that ethylbenzene may cause tumors.

How can ethylbenzene affect children?

Children may be exposed to ethylbenzene through inhalation of consumer products, including gasoline, paints, inks, pesticides, and carpet glue. We do not know whether children are more sensitive to the effects of ethylbenzene than adults.

It is not known whether ethylbenzene can affect the development of the human fetus. Animal studies have shown that when pregnant animals were exposed to ethylbenzene in air, their babies had an increased number of birth defects.

How can families reduce the risk of exposure to ethylbenzene?

Exposure to ethylbenzene vapors from household products and newly installed carpeting can be minimized by using adequate ventilation.

Household chemicals should be stored out of reach of children to prevent accidental poisoning. Always store household chemicals in their original containers; never store them in containers children would find attractive to eat or drink from, such as old soda bottles. Gasoline should be stored in a gasoline can with a locked cap.

Sometimes older children sniff household chemicals, including ethylbenzene, in an attempt to get high. Talk with your children about the dangers of sniffing chemicals.

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

Ethylbenzene is found in the blood, urine, breath, and some body tissues of exposed people. The most common way to test for ethylbenzene is in the urine. This test measures substances formed by the breakdown of ethylbenzene. This test needs to be done within a few hours after exposure occurs, because the substances leave the body very quickly.

These tests can show you were exposed to ethylbenzene, but cannot predict the kind of health effects that might occur.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level of 0.7 milligrams of ethylbenzene per liter of drinking water (0.7 mg/L).

The EPA requires that spills or accidental releases into the environment of 1,000 pounds or more of ethylbenzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set an occupational exposure limit of 100 parts of ethylbenzene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for ethylbenzene. 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.

Manganese - ToxFAQs™

CAS # 7439-96-5

This fact sheet answers the most frequently asked health questions (FAQs) about manganese. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information 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.

HIGHLIGHTS: Manganese is a trace element and eating a small amount from food or water is needed to stay healthy. Exposure to excess levels of manganese may occur from breathing air, particularly where manganese is used in manufacturing, and from drinking water and eating food. At high levels, it can cause damage to the brain. Manganese has been found in at least 869 of the 1,669 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is manganese?

Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese is silver-colored, but does not occur naturally. It combines with other substances such as oxygen, sulfur, or chlorine. Manganese occurs naturally in most foods and may be added to some foods.

Manganese is used principally in steel production to improve hardness, stiffness, and strength. It may also be used as an additive in gasoline to improve the octane rating of the gas.

What happens to manganese when it enters the environment?

- Manganese can be released to the air, soil, and water from the manufacture, use, and disposal of manganese-based products.
- Manganese cannot break down in the environment. It can only change its form or become attached to or separated from particles.
- In water, manganese tends to attach to particles in the water or settle into the sediment.
- The chemical state of manganese and the type of soil determine how fast it moves through the soil and how much is retained in the soil.
- The manganese-containing gasoline additive may degrade in the environment quickly when exposed to sunlight, releasing manganese.

How might I be exposed to manganese?

- The primary way you can be exposed to manganese is by eating food or manganese-containing nutritional supplements. Vegetarians, who consume foods rich in manganese such as grains, beans and nuts, as well as heavy tea drinkers, may have a higher intake of manganese than the average person.
- Certain occupations like welding or working in a factory where steel is made may increase your chances of being exposed to high levels of manganese.
- Manganese is routinely contained in groundwater, drinking water, and soil at low levels. Drinking water containing manganese or swimming or bathing in water containing manganese may expose you to low levels of this chemical.

How can manganese affect my health?

Manganese is an essential nutrient, and eating a small amount of it each day is important to stay healthy.

The most common health problems in workers exposed to high levels of manganese involve the nervous system. These health effects include behavioral changes and other nervous system effects, which include movements that may become slow and clumsy. This combination of symptoms when sufficiently severe is referred to as "manganism". Other less severe nervous system effects such as slowed hand movements have been observed in some workers exposed to lower concentrations in the work place.

Manganese

CAS # 7439-96-5

Exposure to high levels of manganese in air can cause lung irritation and reproductive effects.

Nervous system and reproductive effects have been observed in animals after high oral doses of manganese.

How likely is manganese to cause cancer?

The EPA concluded that existing scientific information cannot determine whether or not excess manganese can cause cancer.

How can manganese affect children?

Studies in children have suggested that extremely high levels of manganese exposure may produce undesirable effects on brain development, including changes in behavior and decreases in the ability to learn and remember. We do not know for certain that these changes were caused by manganese alone. We do not know if these changes are temporary or permanent. We do not know whether children are more sensitive than adults to the effects of manganese, but there is some indication from experiments in laboratory animals that they may be.

Studies of manganese workers have not found increases in birth defects or low birth weight in their offspring. No birth defects were observed in animals exposed to manganese.

How can families reduce the risk of exposure to manganese?

- Children are not likely to be exposed to harmful amounts of manganese in the diet. However, higher-than-usual amounts of manganese may be absorbed if their diet is low in iron. It is important to provide your child with a well-balanced diet.
- Workers exposed to high levels of airborne manganese in certain occupational settings may accumulate manganese dust on their work clothes. Manganese-contaminated work clothing should be removed before getting into your car or entering your home to help reduce the exposure hazard for yourself and your family.

Is there a medical test to determine whether I've been exposed to manganese?

Several tests are available to measure manganese in blood, urine, hair, or feces. Because manganese is normally present in our body, some is always found in tissues or fluids.

Because excess manganese is usually removed from the body within a few days, past exposures are difficult to measure with common laboratory tests.

Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to manganese in drinking water at concentrations of 1 mg/L for up to 10 days is not expected to cause any adverse effects in a child.

The EPA has established that lifetime exposure to 0.3 mg/L manganese is not expected to cause any adverse effects.

The Food and Drug Administration (FDA) has determined that the manganese concentration in bottled drinking water should not exceed 0.05 mg/L.

The Occupational Health and Safety Administration (OSHA) has established a ceiling limit (concentration that should not be exceeded at any time during exposure) of 5 mg/m^3 for manganese in workplace air.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for Manganese. Atlanta, GA: U.S. Department of Public 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 and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

METHYL *TERT*-BUTYL ETHER (MTBE) CAS # 1634-04-4

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1997**

This fact sheet answers the most frequently asked health questions (FAQs) about methyl *tert*-butyl ether (MTBE). 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.

HIGHLIGHTS: Methyl *tert*-butyl ether (MTBE) is a flammable liquid which is used as an additive in unleaded gasoline. Drinking or breathing MTBE may cause nausea, nose and throat irritation, and nervous system effects. MTBE has been found in at least 11 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is methyl *tert*-butyl ether?

(Pronounced mĕth′əl tũ̄r′shē-ĕr′ē byo͞ot′l ē′thər)

Methyl *tert*-butyl ether (MTBE) is a flammable liquid with a distinctive, disagreeable odor. It is made from blending chemicals such as isobutylene and methanol, and has been used since the 1980s as an additive for unleaded gasolines to achieve more efficient burning.

MTBE is also used to dissolve gallstones. Patients treated in this way have MTBE delivered directly to their gall bladders through special tubes that are surgically inserted.

What happens to MTBE when it enters the environment?

- ❑ MTBE quickly evaporates from open containers and surface water, so it is commonly found as a vapor in the air.
- ❑ Small amounts of MTBE may dissolve in water and get into underground water.
- ❑ It remains in underground water for a long time.
- ❑ MTBE may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- ❑ MTBE may be broken down quickly in the air by sunlight.
- ❑ MTBE does not build up significantly in plants and animals.

How might I be exposed to MTBE?

- ❑ Touching the skin or breathing contaminated air while pumping gasoline.
- ❑ Breathing exhaust fumes while driving a car.
- ❑ Breathing air near highways or in cities.
- ❑ Drinking, swimming, or showering in water that has been contaminated with MTBE.
- ❑ Receiving MTBE treatment for gallstones.

How can MTBE affect my health?

Breathing small amounts of MTBE for short periods may cause nose and throat irritation. Some people exposed to MTBE while pumping gasoline, driving their cars, or working

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, Public Health Service
Agency for Toxic Substances and Disease Registry

in gas stations have reported having headaches, nausea, dizziness, and mental confusion. However, the actual levels of exposure in these cases are unknown. In addition, these symptoms may have been caused by exposure to other chemicals.

There are no data on the effects in people of drinking MTBE. Studies with rats and mice suggest that drinking MTBE may cause gastrointestinal irritation, liver and kidney damage, and nervous system effects.

How likely is MTBE to cause cancer?

There is no evidence that MTBE causes cancer in humans. One study with rats found that breathing high levels of MTBE for long periods may cause kidney cancer. Another study with mice found that breathing high levels of MTBE for long periods may cause liver cancer.

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified MTBE as to its carcinogenicity.

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

MTBE and its breakdown product, butyl alcohol, can be detected in your breath, blood, or urine for up to 1 or 2 days after exposure. These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. There is no other test specific to determining MTBE exposure.

Has the federal government made recommendations to protect human health?

The EPA has issued guidelines recommending that, to protect children, drinking water levels of MTBE not exceed 4 milligrams per liter of water (4 mg/L) for an exposure of 1-10 days, and 3 mg/L for longer-term exposures.

The American Conference of Governmental Industrial Hygienists (ACGIH) has recommended an exposure limit of 40 parts of MTBE per million parts of air (40 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or gas.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Sediment: Mud and debris that have settled to the bottom of a body of water.

References

This ToxFAQs information is taken from the 1996 Toxicological Profile for Methyl *tert*-Butyl Ether produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

TETRACHLOROETHYLENE
CAS # 127-18-4

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1997**

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. 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. It's important you understand this information 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.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Tetrachloroethylene has been found in at least 771 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is tetrachloroethylene?
(Pronounced tĕt′rə-klôr′ ō-ĕth′ə-lēn′)

Tetrachloroethylene is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. It is also used to make other chemicals and is used in some consumer products.

Other names for tetrachloroethylene include perchloroethylene, PCE, and tetrachloroethene. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels.

What happens to tetrachloroethylene when it enters the environment?

- ☐ Much of the tetrachloroethylene that gets into water or soil evaporates into the air.
- ☐ Microorganisms can break down some of the tetrachloroethylene in soil or underground water.
- ☐ In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain.
- ☐ It does not appear to collect in fish or other animals that live in water.

How might I be exposed to tetrachloroethylene?

- ☐ When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- ☐ When you drink water containing tetrachloroethylene, you are exposed to it.

How can tetrachloroethylene affect my health?

High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used tetrachloroethylene to get a "high."

In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known.

Results from some studies suggest that women who work in dry cleaning industries where exposures to tetrachloroethylene can be quite high may have more menstrual problems and spontaneous abortions than women who are not exposed. However, it is not known if tetrachloroethylene was responsible for these problems because other possible causes were not considered.

Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Exposure to very high levels of tetrachloroethylene can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

How likely is tetrachloroethylene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Tetrachloroethylene has been shown to cause liver tumors in mice and kidney tumors in male rats.

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

One way of testing for tetrachloroethylene exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood.

Because it is stored in the body's fat and slowly released into the bloodstream, tetrachloroethylene can be detected in the breath for weeks following a heavy exposure.

Tetrachloroethylene and trichloroacetic acid (TCA), a breakdown product of tetrachloroethylene, can be detected in the blood. These tests are relatively simple to perform. These tests aren't available at most doctors' offices, but can be performed at special laboratories that have the right equipment.

Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to tetrachloroethylene or the other chemicals.

Has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of tetrachloroethylene that can be in drinking water is 0.005 milligrams tetrachloroethylene per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that tetrachloroethylene be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

Glossary

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Tetrachloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

TRICHLOROETHYLENE

CAS # 79-01-6

Division of Toxicology ToxFAQs™ **July 2003**

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. 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.

HIGHLIGHTS: Trichloroethylene is a colorless liquid which is used as a solvent for cleaning metal parts. Drinking or breathing high levels of trichloroethylene may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical.

What happens to trichloroethylene when it enters the environment?

❑ Trichloroethylene dissolves a little in water, but it can remain in ground water for a long time.

❑ Trichloroethylene quickly evaporates from surface water, so it is commonly found as a vapor in the air.

❑ Trichloroethylene evaporates less easily from the soil than from surface water. It may stick to particles and remain for a long time.

❑ Trichloroethylene may stick to particles in water, which will cause it to eventually settle to the bottom sediment.

❑ Trichloroethylene does not build up significantly in plants and animals.

How might I be exposed to trichloroethylene?

❑ Breathing air in and around the home which has been contaminated with trichloroethylene vapors from shower water or household products such as spot removers and typewriter correction fluid.

❑ Drinking, swimming, or showering in water that has been contaminated with trichloroethylene.

❑ Contact with soil contaminated with trichloroethylene, such as near a hazardous waste site.

❑ Contact with the skin or breathing contaminated air while manufacturing trichloroethylene or using it at work to wash paint or grease from skin or equipment.

How can trichloroethylene affect my health?

Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating.

Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.

Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death.

Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear.

Skin contact with trichloroethylene for short periods may cause skin rashes.

How likely is trichloroethylene to cause cancer?

Some studies with mice and rats have suggested that high levels of trichloroethylene may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of trichloroethylene in drinking water or in workplace air have found evidence of increased cancer. Although, there are some concerns about the studies of people who were exposed to trichloroethylene, some of the effects found in people were similar to effects in animals.

In its 9th Report on Carcinogens, the National Toxicology Program (NTP) determined that trichloroethylene is "reasonably anticipated to be a human carcinogen." The International Agency for Research on Cancer (IARC) has determined that trichloroethylene is "probably carcinogenic to humans."

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

If you have recently been exposed to trichloroethylene, it can be detected in your breath, blood, or urine. The breath test, if it is performed soon after exposure, can tell if you have been exposed to even a small amount of trichloroethylene.

Exposure to larger amounts is assessed by blood and urine tests, which can detect trichloroethylene and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products, so their detection is not absolute proof of exposure to trichloroethylene. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level for trichloroethylene in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water.

The EPA has also developed regulations for the handling and disposal of trichloroethylene.

The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 100 parts of trichloroethylene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.
CAS: Chemical Abstracts Service.
Evaporate: To change into a vapor or gas.
Milligram (mg): One thousandth of a gram.
Nonflammable: Will not burn.
ppm: Parts per million.
Sediment: Mud and debris that have settled to the bottom of a body of water.
Solvent: A chemical that dissolves other substances.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Trichloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

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 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.

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TOLUENE

CAS # 108-88-3

Division of Toxicology ToxFAQs™ **February 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about toluene. 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. It's important you understand this information 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.

HIGHLIGHTS: Exposure to toluene occurs from breathing contaminated workplace air, in automobile exhaust, some consumer products paints, paint thinners, fingernail polish, lacquers, and adhesives. Toluene affects the nervous system. Toluene has been found at 959 of the 1,591 National Priority List sites identified by the Environmental Protection Agency

What is toluene?

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal.

Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.

What happens to toluene when it enters the environment?

❑ Toluene enters the environment when you use materials that contain it. It can also enter surface water and groundwater from spills of solvents and petrolieum products as well as from leasking underground storage tanks at gasoline stations and other facilities.

❑ When toluene-containing products are placed in landfills or waste disposal sites, the toluene can enter the soil or water near the waste site.

❑ Toluene does not usually stay in the environment long.

❑ Toluene does not concentrate or buildup to high levels in animals.

How might I be exposed to toluene?

❑ Breathing contaminated workplace air or automobile exhaust.

❑ Working with gasoline, kerosene, heating oil, paints, and lacquers.

❑ Drinking contaminated well-water.

❑ Living near uncontrolled hazardous waste sites containing toluene products.

How can toluene affect my health?

Toluene may affect the nervous system. Low to moderate levles can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and hearing and color vision loss. These symptoms usually disappear when exposure is stopped.

Inhaling High levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It can also cause unconsciousness, and even death.

High levels of toluene may affect your kidneys.

How likely is toluene to cause cancer?

Studies in humans and animals generally indicate that toluene does not cause cancer.

The EPA has determined that the carcinogenicity of toluene can not be classified.

How can toluene affect children?

It is likely that health effects seen in children exposed to toluene will be similar to the effects seen in adults.
Some studies in animals suggest that babies may be more sensitive than adults.

Breathing very high levels of toluene during pregnancy can result in children with birth defects and retard mental abilities, and growth. We do not know if toluene harms the unborn child if the mother is exposed to low levels of toluene during pregnancy.

How can families reduce the risk of exposure to toluene?

❑ Use toluene-containing products in well-ventilated areas.

❑ When not in use, toluene-containing products should be tightly covered to prevent evaporation into the air.

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

There are tests to measure the level of toluene or its breakdown products in exhaled air, urine, and blood. To determine if you have been exposed to toluene, your urine or blood must be checked within 12 hours of exposure. Several other chemicals are also changed into the same breakdown products as toluene, so some of these tests are not specific for toluene.

Has the federal government made recommendations to protect human health?

EPA has set a limit of 1 milligram per liter of drinking water (1 mg/L).

Discharges, releases, or spills of more than 1,000 pounds of toluene must be reported to the National Response Center.

The Occupational Safety and Health Administration has set a limit of 200 parts toluene per million of workplace air (200 ppm).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Toluene. 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 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.

Polycyclic Aromatic Hydrocarbons (PAHs) - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the CDC Information Center at 1-800-232-4636. 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.

HIGHLIGHTS: 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 (NPL) 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.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences

ATSDR

Polycyclic Aromatic Hydrocarbons

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 and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

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.

APPENDIX B
COLD STRESS PROGRAM

1.0 PURPOSE & INTRODUCTION

The purpose of this document is to educate Site personnel about exposure to cold environments and the effects of hypothermia and other cold-related injuries. Through proper use of personal protective equipment (PPE), engineering and administrative controls, and education, cold injury—both to the extremities and the body's core temperature—can be prevented.

2.0 SCOPE

The program described herein is intended for use by employees engaged in work with the potential for exposure to cold environments. Training will be provided annually to all those potentially affected prior to the start of field work potentially involving cold exposure.

3.0 WORKING IN COLD ENVIRONMENTS

3.1 Metabolic Responses

The human body is designed to function best at a rectal temperature of 99-100 ºF. The body maintains this temperature in two ways: by gaining heat from food and muscular work; or, by losing it through radiation and sweating. By constricting blood vessels of the skin and/or shivering, the body uses its first line of cold defense.

Temperature control of the body is better understood by dividing the body into two main parts: the shell and the core. The shell is comprised of the skin, capillaries, nerves, muscles, and fat. Other internal organs such as the heart, lungs, brain, and kidneys make up the core.

During exposure to cold, the skin is first affected. Blood in the peripheral capillaries is cooled, sending a signal to a portion of the brain called the hypothalamus. Regulating body temperature is one of the many basic body functions of the hypothalamus. Acting like a thermostat, adjustments are performed to maintain normal body temperatures. When a chill signal is received, two processes are begun by the hypothalamus: conserve heat already in the body and generate new heat.

Heat conservation is performed through constriction of the blood vessels in the skin (shell), thus reducing heat loss from the shell and acting as an insulator for the core. Sweat glands are also inhibited, thus preventing heat loss by evaporation.

Additional fuel for the body is provided in the form of glucose. Glucose causes the heart to beat faster, sending oxygen and glucose-rich blood to the tissue where needed. In an attempt to produce heat, the muscles rapidly contract. This process is better known as "shivering," and generates heat similarly to that created by strenuous activity, raising the body's metabolic rate.

During physical activity and fatigue, the body is more prone to heat loss. As exhaustion approaches, blood vessels can suddenly enlarge, resulting in rapid loss of heat. Exposure to extreme cold causes nerve pulses to be slowed, resulting in fumbling, sluggish, and clumsy reactions.

4.0 COLD INJURIES

Cold injuries are classified into two categories: local and general. Local injuries include frostbite, frostnip, chilblain, and trenchfoot. General injuries include hypothermia and blood vessel abnormalities (genetically or chemically induced). Factors contributing to cold injury include: exposure to humidity and high winds;

contact with wetness or metal; inadequate clothing; age; and general health. Allergies, vascular disease, excessive smoking and/or drinking, and certain drugs and medicines are physical conditions that can compound the effects of exposure to a cold environment.

4.1 Hypothermia

Hypothermia is a condition of reduced body temperature. Most cases develop in air temperatures between 30-50 °F, not taking wind-chill factor in consideration.

Symptoms of hypothermia are uncontrolled shivering and the sensation of cold. The heartbeat slows and sometimes becomes irregular, weakening the pulse and changing blood pressure. Changes in the body chemistry cause severe shaking or rigid muscles; vague or slow slurred speech; memory lapses; incoherence; and drowsiness. Cool skin, slow irregular breathing, low blood pressure, apparent exhaustion, and fatigue after rest can be seen before complete collapse.

As the core temperature drops, the victim can become listless, confused, and make little or no effort to keep warm. Pain in the extremities can be the first warning of dangerous exposure to cold. Severe shivering must be taken as a sign of danger. At a core body temperature of about 85 °F, serious problems develop due to significant drops in blood pressure, pulse rate, and respiration. In some cases, the victim may die.

Sedative drugs and alcohol increase the risk of hypothermia. Sedative drugs interfere with the transmission of impulses to the brain. Alcohol dilates blood vessels near the skin’s surface, increasing heat loss and lowering body temperature.

Table B1 provides information on the onset of hypothermia and metabolic responses at different body temperatures.

4.2 Raynaud’s Phenomenon

Raynaud’s Phenomenon is the abnormal constriction of the blood vessels of the fingers on exposure to cold temperatures, resulting in blanching of the ends of the fingers. Numbness, itching, tingling, or a burning sensation may occur during related attacks. The disease is also associated with the use of vibrating hand tools in a condition sometimes called White Finger Disease. Persistent cold sensitivity, ulceration, and amputations can occur in severe cases.

4.3 Acrocyanosis

Acrocyanosis is caused by exposure to the cold and reduces the level of hemoglobin in the blood, resulting in a slightly blue, purple, or gray coloring of the hands and/or feet.

4.4 Thromboangitis Obliterans

Thromboangitis obliterans is clotting of the arteries due to inflammation and fibrosis of connective tissue surrounding medium-sized arteries and veins. This is one of the many disabling diseases that can also result from tobacco use. Gangrene of the affected limb often requires amputation.

4.5 Frostbite

Frostbite is the freezing of the body tissues due to exposure to extremely low temperatures, resulting in damage to and loss of tissue. Frostbite occurs because of inadequate circulation and/or insulation, resulting in freezing of fluids around the cells of the body tissues. Most vulnerable parts of the body are the nose, cheeks, ears, fingers, and toes.

Frostbite can affect outer layers of skin or can include the tissues beneath. Damage can be serious, with permanent loss of movement in the affected parts, scarring, necrotic tissue, and amputation all possibilities. Skin and nails that slough off can grow back.

The freezing point of the skin is about 30 °F. As wind velocity increases, heat loss is greater and frostbite will set in more rapidly.

There are three degrees of frostbite: first degree, freezing without blistering and peeling; second degree, freezing with blistering and peeling; and third degree, freezing with death of skin tissues and possibly the deeper tissues.

The following are symptoms of frostbite:

1. Skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies;
2. Pain may be felt at first, but subsides;
3. Blisters may appear; and
4. Affected part is cold and numb.

The first symptom of frostbite is usually an uncomfortable sensation of coldness followed by numbness. Tingling, stinging, cramping, and aching feelings will be experienced by the victim. Frostbite of the outer layer of the skin has a waxy or whitish look and is firm to the touch. Cases of deep frostbite cause severe injury. The tissues are cold, pale, and solid. The victim is often unaware of the frostbite until someone else observes these symptoms. It is therefore important to use the "buddy system" when working in cold environments, so that any symptoms of overexposure can be noted.

Table B2 describes the cooling power of wind on exposed flesh. This information can be used as a guide for determining equivalent chill temperatures when the wind is present in cold environments.

4.6 Trench Foot and Chilblains

Trench foot is swelling of the foot caused by long, continuous exposure to cold without freezing, combined with persistent dampness or immersion in water. Edema (swelling), tingling, itching and severe pain occurs, followed by blistering, necrotic tissue, and ulcerations. Chilblains have similar symptoms as trench foot, except that other areas of the body are affected.

4.7 Frostnip

Frostnip occurs when the face or extremities are exposed to a cold wind, causing the skin to turn white.

5.0 PREVENTION OF COLD STRESS

Cold stress can be prevented through a combination of various factors: acclimation; water and salt displacement; medical screening; proper clothing selection; and training and education. Through the use of engineering controls, work practices, work/rest schedules, environmental monitoring, and consideration of the wind-chill temperature, the employee can be protected.

5.1 Acclimation

Acclimation can be achieved to some degree. Sufficient exposure to cold causes the body to undergo changes to increase comfort and reduce the risk of injury. However, these changes are minor and require repeated exposure to cold and uncomfortable temperatures to induce them.

5.2 Dehydration

The dryness of cold air causes the body to lose a significant amount of water through the skin and lungs. It is essential that caffeine-free, non-alcoholic beverages be available at the worksite for fluid replacement. Dehydration also increases the risk of injury due to cold and affects blood flow to the extremities.

5.3 Diet

A well-balanced diet is important for employees working in cold environments. Diets restricted only to certain foods may not provide the necessary elements for the body to withstand cold stress, leaving the worker vulnerable.

5.4 Control Measures

When the wind chill factor results in an equivalent temperature of -26 °F, continuous exposure of the skin will not be permitted. Any worker exposed to temperatures of 36 °F or less who becomes immersed in water will be given dry clothing immediately and treated for hypothermia at the local hospital if any symptoms of hyperthermia are present. Notification of this incident will be provided to the Health and Safety Division immediately after sending the worker to the hospital.

5.5 Environmental Controls

The following are some ways that environmental controls can be used to reduce the effects of a cold environment:

1. General or spot heating should be used to increase temperature in certain areas in the workplace;
2. Warm air jets, radiant heaters, or contact warm plates can be used to warm the worker's hands if fine work is to be performed with bare hands for 10 to 20 minutes or more;
3. Shield the work area if air velocity at the worksite is increased by wind, draft, or ventilating equipment;
4. Metal handles of tools and control bars should be covered with thermal insulating material at temperatures below 30 °F;
5. Unprotected metal chair seats will not be used in cold environments;
6. When appropriate and feasible, equipment and processes will be substituted, isolated, relocated, or redesigned;
7. Power tools, hoists, cranes, or lifting aids will be used to reduce the metabolic workload;
8. Heated warming shelters will be made available for continuous work being performed in an equivalent temperature of 20 °F or below and workers will be encouraged to use the shelters regularly; and
9. Administrative work practice controls should be implemented.

Work practices and guidelines can be designed and developed to reduce exposure to cold stress. Some of these may include:

1. Create work-rest schedules to reduce the peak of cold stress;
2. Enforce scheduled breaks;
3. Enforce intake of caffeine-free, non-alcoholic beverages;

4. Schedule work that has potential exposure to cold stress for the warmest part of the day;
5. Move work to warmer areas, whenever possible;
6. Assign extra workers for high-demand tasks;
7. Provide relief workers for other workers needing breaks;
8. Teach basic principles of recognizing and preventing cold stress;
9. Use the buddy system for work at 10 °F or below, and keep within eyeshot;
10. Allow new employees to adjust to the conditions before they work full-time in cold environments;
11. Minimize sitting and standing in one place for long periods of time; and
12. Include weight and bulkiness of clothing when estimating work performance requirements and weights to be lifted.

Table B3 provides a work/warm-up schedule for cold environments, with wind chill taken into account.

5.6 Special Considerations

Older workers and workers with circulatory problems should be extra careful in cold environments. Sufficient sleep and good nutrition are important preventive measures for maintenance tolerance to the cold. Double shifts and overtime work should be avoided when working in cold environments.

If any of the following symptoms are observed on-site, the affected worker will immediately go to warm shelter:

- Onset of heavy shivering;
- Frostnip;
- Feeling of excessive fatigue;
- Drowsiness; and
- Euphoria.

After entering the warm shelter, the outer layer of clothing should be removed. If the clothing is wet from sweat and perspiration, dry clothing should be provided. If this is not feasible, then the clothing should be loosened to allow sweat to evaporate.

Anyone working in cold environments and on prescribed medication should consult their physician concerning any possible side effects due to cold stress. Those individuals suffering from diseases and/or taking medication that interferes with normal body temperature regulation or reduces the tolerance to cold will not be allowed to work in temperatures of 30 °F or below.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

In choosing PPE for cold environments, it is important to maintain airspace between the body and outer layer of clothing to retain body heat. The more air pockets, the better the insulation. The clothing should also allow for the evaporation of sweat if the skin is wet.

The most important parts of the body to protect are the feet, hands, head, and face. Hands and feet become cooled most easily, because of their distance from the heart. Keeping the head covered is equally important. As much as 40% of body heat loss is through the head when it is exposed.

Ideal clothing for exposure to cold environments is made of wool, polypropylene, or other wicking fabrics. Loose-fitted clothing also aids in sweat evaporation. Recommended clothing may include the following:

1. Polypropylene under shirt and shorts under thermal underwear (preferably two-piece);
2. Wool socks;
3. Wool or thermal pants, lapped over boot tops to keep out snow and water;
4. Suspenders (belts can constrict and reduce circulation);
5. Insulated work boots, preferably waterproof. Safety toe, if necessary;
6. Wool or cotton shirt;
7. Parka;
8. Knit cap/hard hat liner;
9. Wool mittens or gloves (depending on the dexterity required); and
10. Face mask or scarf.

Dirty or greasy clothing loses much of its insulation value. Dirty clothing crushes air pockets, allowing air to escape more easily. Also, denim is not a good protective fabric. It is loosely woven and allows water to penetrate and wind to blow away body heat.

Table B1
Progressive Clinical Presentation of Hypothermia

Core Temperature		**Clinical Signs**
°C	**°F**	
37.6	99.6	“Normal” Rectal Temperature
37	98.6	“Normal” Oral Temperature
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss
35	95.0	Maximum shivering
34	93.2	Victim conscious and responsive, with normal blood pressure
33	91.4	Severe hypothermia below this temperature
32	89.6	Consciousness clouded, blood pressure becomes difficult to obtain, pupils dilated but react to light, shivering ceases
31	87.8	
30	86.0	Progressive loss of consciousness, muscular rigidity increases, pulse and blood pressure difficult to obtain, respiratory rate decreases
29	84.2	
28	82.4	Ventricular fibrillation possible with myocardial irritability

Table B1
Progressive Clinical Presentation of Hypothermia

Core Temperature		Clinical Signs
°C	°F	
27	80.6	Voluntary motion ceases, pupils non-reactive to light, deep tendon and superficial reflexes absent
26	78.8	
25	77.0	Ventricular fibrillation may occur spontaneously
24	75.2	Pulmonary edema
22	71.6	Maximum risk of ventricular fibrillation
20	68.0	Cardiac standstill
18	64.4	Lowest accidental hypothermia victim to recover
17	62.6	Isoelectric electroencephalogram
9	48.2	Lowest artificially cooled hypothermia patient to recover
Presentations approximately related to core temperature. Reprinted from the January 1982 issue of American Family Physician, published by the American Academy of Family Physicians.		

Table B2
Cooling Power of Wind on Exposed Flesh as Equivalent Temperature

Estimated Wind Speed (mph)	Actual Temperature Reading (Degrees Fahrenheit)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
	LITTLE DANGER In < hr with dry skin. Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute.			GREAT DANGER Flesh may freeze within 30 seconds.				
Developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA. Wind speeds greater than 40 mph have little additional effect. Trenchfoot and immersion foot may occur at any point.												

Table B3
Threshold Limit Values Work/Warm-up Schedule for 4-Hour Shift

Air Temp. Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
˚C (approx)	˚F (approx)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to -28°	-15° to -19°	(Norm. Breaks)	1	(Norm.Breaks)	1	75 min.	2	55 min.	3	40 min.	4
-29° to -31°	-20° to -24°	(Norm. Breaks)	1	75 min	2	55 min.	3	40 min.	4	30 min.	5
-32° to -34°	-25° to -29°	75 min	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min.	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease									

Notes:
Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For light to moderate work (limited physical motion), apply the schedule one step lower. For example, at -30 °F with no noticeable wind (step 4, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period.
The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph, light flag moves; 10 mph, light flag fully extended; 15 mph, raises newspaper sheet; 20 mph, blowing drifting snow.
If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: 1) special warm-up breaks should be initiated at a wind-chill cooling rate of about 17 watts per square meter (W/m^2); 2) all non-emergency work should have ceased at or before a wind-chill of 2250 W/m^2. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart over-compensates for the actual temperatures in the colder ranges, since windy conditions prevail at extremely low temperatures.
Threshold limit values (TLVs) apply only for workers in dry clothing.
Adapted from Occupational Health and Safety Division, Saskatchewan Department of Labor.

APPENDIX C
HEAT STRESS PROGRAM

1.0 INTRODUCTION

Heat stress is one of the most common (and potentially serious) illnesses at job sites. Although it is caused by a number of interacting factors, donning the proper personal protective equipment (PPE) puts the worker at a much higher risk during warmer environmental conditions. The results of heat stress range from fatigue to serious illness or death. Through regular fluid replacement and other preventive measures, heat stress can be controlled, leading to increased efficiency and a higher level of safety on the job.

2.0 PURPOSE

The purpose of this document is to create an awareness among employees concerning the body's physiologic responses to heat, different types of heat stress that can affect the body, recognition of signs and symptoms, first aid treatment, and preventive measures.

3.0 SOURCES OF HEAT

There are two sources of heat that are important to anyone working in a hot environment:

- Internally generated metabolic heat; and
- Externally imposed environmental heat.

4.0 PHYSIOLOGIC RESPONSES TO HEAT

The human body maintains a fairly constant internal temperature, even though it is exposed to varying environmental temperatures. To keep internal body temperatures within safe limits, the body must get rid of its excess heat, primarily through varying the rate and amount of blood circulation through the skin and the release of fluid onto the skin by the sweat glands. These automatic responses usually occur when the temperature of the blood exceeds 98.6 °F and are kept in balance and controlled by the brain. In this process of lowering internal body temperature, the heart begins to pump more blood, blood vessels expand to accommodate the increased flow, and the microscopic blood vessels (capillaries) which thread through the upper layers of the skin begin to fill with blood. The blood circulates closer to the surface of the skin, and the excess heat is lost to the cooler environment.

If the heat loss from increased blood circulation through the skin is not adequate, the brain continues to sense overheating and signals the sweat glands in the skin to release large quantities of sweat onto the skin surface. Evaporation of sweat cools the skin, eliminating large quantities of heat from the body.

As environmental temperatures approach normal skin temperature, cooling of the body becomes more difficult. If air temperature is as warm as or warmer than the skin, blood brought to the body surface cannot lose its heat. Under these conditions, the heart continues to pump blood to the body surface, the sweat gland pour liquids containing electrolytes onto the surface of the skin, and the evaporation of the sweat becomes the principal effective means of maintaining a constant body temperature. Sweating does not cool the body unless the moisture is removed from the skin by evaporation. In high humidity, the evaporation of sweat from the skin is decreased and the body's efforts to maintain an acceptable body temperature may be significantly impaired. These conditions adversely affect an individual's ability to work in the hot environment. With so much blood going to the external surface of the body, relatively less goes to the active muscles, the brain, and other internal organs; strength declines; and fatigue occurs sooner than it would otherwise. Alertness and mental capacity also may be affected. Workers who must perform delicate or detailed work may find their accuracy suffering, and others may find their comprehension and retention of information lowered.

When temperature differences exist between two or more bodies, heat can be transferred. Net heat transfer is always from the body (or object) of higher temperature to that of lower temperature and occurs by one or more of the following mechanisms:

- Conduction: The transfer of heat from one point to another within the body, or from one body to another when both bodies are in physical contact. Conduction can be a localized source of discomfort from direct physical contact with a hot or cold surface; it is normally not a significant factor to total heat stress.
- Convection: The transfer of heat from one place to another by moving gas or liquid. Natural convection results from differences in density caused by temperature differences. Thus, warm air is less dense than cool air.
- Radiation: The process by which energy, electromagnetic (visible and infrared), is transmitted through space without the presence or movement of matter in or through this space.

5.0 PREDISPOSING FACTORS TO HEAT STRESS

Factors that may predispose an individual to heat stress vary according to the individual. These factors include:

- Lack of physical fitness;
- Lack of acclimatization;
- Age;
- Dehydration;
- Obesity;
- Drug/alcohol abuse;
- Infection;
- Sunburn;
- Diarrhea; and
- Chronic disease.

Predisposing factors and an increased risk of excessive heat stress are both directly influenced by the type and amount of PPE worn. PPE adds weight and bulk, reduces the body’s access to normal heat exchange mechanisms (evaporation, convection, and radiation), and increases energy expenditure.

6.0 FORMS OF HEAT STRESS AND FIRST AID

The following excerpts were taken from National Institute for Occupational Safety and Health (NIOSH) Publication No. 86-112, Working in Hot Environments:

“Excessive exposure to a hot work environment can bring about a variety of heat-induced disorders. Among the most common are heat stroke, heat exhaustion, heat cramps, fainting and heat rash.”

6.1 Heat Stroke

Heat Stroke is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, and red or spotted. Body temperature is usually 105 °F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

Individuals with signs or symptoms of heat stroke require immediate hospitalization. First aid should be immediately administered. This includes removing the victim to a cool area, thoroughly soaking the clothing with water, and vigorously fanning the body to increase cooling. Further treatment, at a medical facility, should be directed to the continuation of the cooling process and the monitoring of complications that often accompany heat stroke. Early recognition and treatment are the only means of preventing permanent brain damage or death.

6.2 Heat Exhaustion

Heat exhaustion includes several clinical disorders having symptoms that may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

In most cases, treatment involves having the victim rest in a cool place and drink plenty of liquids. Victims with mild cases of heat exhaustion usually recover spontaneously with this treatment. Those with severe cases may require extended care for several days. There are no known permanent effects.

6.3 Heat Cramps

Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large amounts of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly after, the low salt level in the muscles causes painful cramps. The affected muscles may be part of the arms, legs, or abdomen, but tired muscles (those used in performing the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth.

6.4 Fainting

Fainting occurs in workers not accustomed to hot environments and who stand erect and immobile in the heat.

With enlarged blood vessels in the skin and in the lower part of the body due to the body's attempts to control internal temperature, blood may pool there rather than return to the heart to be pumped to the brain. Upon lying down, the worker should soon recover. By moving around, and thereby preventing blood from pooling, the patient can prevent further fainting.

6.5 Heat Rash (Prickly Heat)

Heat rash, also known as prickly heat, is likely to occur in hot, humid environments where sweat is not as easily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by infection, prickly heat can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by resting in a cool place part of each day and by regularly bathing and drying the skin.

7.0 SELECTION OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

During work periods where the increased risk of heat stress exists, each item's benefit will be carefully evaluated. Once the PPE is chosen, safe work durations/rest periods will be determined based on the following conditions:

- Anticipated work rate;
- Ambient temperature and humidity; and
- Level of protection.

8.0 PREVENTION OF HEAT STRESS

Prevention of heat stress will be addressed in the following manner:

- Adjustment of work schedules.
- Modification of work/rest schedules.
    1. Enforce work slowdowns, as needed.
    2. Rotate personnel to minimize overstress or overexertion.
    3. When possible, work will be scheduled and performed during cooler hours.
- Providing shelter or shaded areas to protect personnel during rest periods.
- Maintaining workers' body fluids at normal levels.
    1. Drink approximately 12 to 16 ounces of non-caffeinated liquids (preferably water, Gatorade or equivalent) prior to the start of work. Caffeinated fluids act to dehydrate the worker.
    2. Workers will be urged to drink a cup or two every 15 to 20 minutes, or at each break. A total of 1 to 1.5 gallons of water per individual per day is recommended for fluid replacement under heat stress conditions, but more may be required.
- Encouraging physical fitness among the workers.
- Gradually acclimatizing workers on-site to help build up an "immunity" to the conditions.
    1. Heat acclimatization can usually be induced in 5 to 7 days of exposure at a hot job. For workers with previous experience with the job, acclimatization will include exposures of 50% for day one, 60% for day two, 80% for day three, and 100% for the remaining additional days.
- Providing cooling devices during prolonged work or severe heat exposure.
    1. Supply field showers or hose down areas.
    2. Supply personnel with cooling jackets, vests, and suits.
- Training workers in recognition and treatment of heat stress.
- Using the buddy system that depends on the recognition of signs and symptoms of heat stress.
- Identifying heat-intolerant individuals through medical screening.

APPENDIX D
INCIDENT REPORT FORM

Incident Report Form

Supervisor's Name: ______________________________

Basic Rules for Accident Investigation

- Find the cause to prevent future accidents - Use an unbiased approach during investigation.
- Interview witnesses & injured employees at the scene - conduct a walkthrough of the accident.
- Conduct interviews in private - Interview one witness at a time.
- Get signed statements from all involved.
- Take photos or make a sketch of the accident scene.
- What hazards are present - what unsafe acts contributed to accident?
- Ensure hazardous conditions are corrected immediately.

Date & Time		**Location**	
Task Performed		**Witnesses**	
Resulted In	___ **Injury** ___ **Fatality** ___ **Property Damage**	**Property Damage**	
Injured		**Injured**	
Describe Accident Facts & Events			

Supervisors Root Cause Analysis (Check ALL that apply to the accident)			
Unsafe Act		**Unsafe Conditions**	
Improper work technique		Poor workstation design	
Safety rule violation		Unsafe operation method	
Improper PPE or PPE not used		Improper maintenance	
Operating without authority		Lack of direct supervision	
Failure to warn or secure		Insufficient training	
Operating at improper speeds		Lack of experience	
By-passing Safety device		Insufficient knowledge of job	
Protective equipment not in use		Slippery conditions	
Improper loading or placement		Excessive noise	

Improper lifting		Inadequate guarding of hazards	
Servicing Machinery in motion		Defective tools/equipment	
Horseplay		Poor housekeeping	
Drug or alcohol use		Insufficient lighting	
Unsafe Acts require a written warning and re-training before the employee resumes work.			
Date		**Date**	
Retraining Assigned		**Unsafe Condition Guarded**	
Retraining Completed		**Unsafe Condition Corrected**	
Supervisor Signature		**Supervisor Signature**	

272 4TH AVENUE

BROOKLYN, NEW YORK

Community Air Monitoring Plan

NYSDEC Site Number: C224298
AKRF Project Number: 190021

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau B
625 Broadway, 12th Floor
Albany, New York 12233

On Behalf Of:

Carroll Street Borrower LLC
272 4th Avenue LLC
274 4th and 538 Carroll LLC
51 East 12th Street, 7th Floor
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Prepared by:

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DECEMBER 2024

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1.0 INTRODUCTION

1.1 Purpose

This Community Air Monitoring Plan (CAMP) was prepared by AKRF, Inc. (AKRF) on behalf of 272 4th Avenue LLC and 538 Caroll Street Borrower LLC for the 272 4th Avenue Brownfield Cleanup Program (BCP) site located in the Gowanus neighborhood of Brooklyn, New York (hereinafter referred to as the Site). The Site is an approximately 0.347-acre parcel identified on the New York City Tax Map as Block 456, Lot 13 (formerly Lots 13, 17, and 23). Figure 1 shows the Site location.

The Site was remediated to Track 2 and/or Track 4 New York State Department of Environmental Conservation (NYSDEC) Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs) and/or Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) for petroleum-related volatile organic compounds (VOCs) in accordance with the July 2022 NYSDEC-approved Remedial Action Work Plan (RAWP) and Decision Document. A Site Management Plan (SMP) was prepared to manage remaining contamination at the Site, as required by the Environmental Easement. The Environmental Easement is an Institutional Control (IC) restricting the type of use at the Site after completion of the remedial program under the RAWP. Details on the Site environmental history and remedial activities performed under the RAWP are provided in the SMP.

Engineering Controls (ECs) have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. The following ECs were installed at the Site: (1) a site-wide cover system; and (2) an active sub-slab depressurization system (SSDS). An Environmental Easement granted to NYSDEC and recorded with the Kings County Office of the City Register requires compliance with the SMP, and all ECs and ICs placed on the Site.

The ICs place restrictions on Site use and mandate operation, maintenance, monitoring, and reporting measures for all ECs and ICs. The SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that may remain at the Site. The SMP has been approved by NYSDEC, and compliance with the plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. The SMP may be revised only with the approval of NYSDEC.

This CAMP, which is an appendix to the SMP, details the procedures required for monitoring workspace air quality during any activities performed at the Site under the SMP that require management of residual contamination. All workers who participate in remediation-related activities at the Site that are under the direction of AKRF and/or the Site owner are required to comply with the provisions specified in this CAMP.

2.0 SITE HISTORY AND BACKGROUND

Historical records, including Sanborn maps and a city directory search, indicated that former Lot 23 had numerous historical automotive uses, with some commercial and residential uses. The Site was developed as a bottle factory with a stable around 1906. Between 1926 and the 2022, former Lot 23 was used for automobile uses, including a gasoline filling station, a dealership, and an automobile service and repair facility. Former Lot 17 was originally developed as part of a bottle manufacturing facility around 1906. By 1926, former Lot 17 contained a single-story structure used by a wheelwright, and by 1951, the lot was an automobile garage. Around 1965, former Lot 17 was part of a machine shop, and around 1978, it appeared to be an office. Former Lot 13 was developed with a stone yard with a single-story shed around 1926. By 1951, the lot was depicted as a metal and wood finishing facility, and around 1965, former Lot 13 was depicted as an automobile repair facility. Around 1978 the lot was used for unspecified manufacturing uses. Former Lot 13 was also listed with the following uses between 1927 and 2017: automobile repair, steam equipment manufacturing, appliance manufacturing, and janitorial supplies sales.

The Site now consists of a multi-story mixed use commercial and residential building, which is currently under construction.

Between September 2023 and April 2024, the Site was remediated in accordance with the NYSDEC-approved RAWP. The remedial elements performed consisted of the following:

- Soil/fill was excavated and removed from the Site to achieve a combination Track 2 and Track 4 remedy. Remedial excavation extended to varying depths from approximately 2 feet below ground surface (bgs) to 17 feet bgs across the Site, and included:
    a. Excavation to between 2 and 12 feet bgs in the Track 4 area to remove source material, including petroleum-contaminated soil identified during implementation of the RAWP along the eastern Site boundary and in the western portion of the Site associated with eight (8) previously unknown underground storage tanks (USTs) discovered during remedial excavation; and
    b. Excavation ranging from a depth of approximately 13 to 17 feet bgs in the Track 2 area, which included material from the area of the partial cellar and groundwater treatment area to remove petroleum-contaminated source material associated with NYSDEC Spill No. 2005727.
- A groundwater treatment program consisting of application and mechanical mixing of Regenesis Oxygen Release Compound® (ORC) was performed to address residual soil and groundwater contamination associated with NYSDEC Spill No. 2005727. Three permanent groundwater wells were subsequently installed as part of a quarterly monitoring program.
- A vapor mitigation system, consisting of the sub-slab piping for the active SSDS and a minimum 0.20-mil vapor barrier, was installed beneath the new building slab and cellar walls to mitigate potential soil vapor intrusion.
- Site-wide dewatering was implemented in accordance with all federal, state, and local regulations, as necessary, to enable the remedial excavation activities.
- A Community Air Monitoring Plan (CAMP) was implemented during all intrusive Site activities to monitor levels of VOCs and particulates within the active work-zones and around the perimeter of the Site.
- During any intrusive Site work, screening was conducted for indications of soil contamination [i.e., by visual means, odor, and monitoring with photoionization detector (PID)].
- Appropriate off-site disposal of all materials removed from the Site was performed in accordance with all federal, state, and local rules and regulations for handling, transport, and disposal. Waste disposal

facilities were selected based on waste classification sampling and data collected prior to the Remedial Action.

- Importation of fill meeting the requirements of 6 New York Codes, Rules, and Regulations (NYCRR) Part 375-6.7(d) was used to replace excavated soil and/or establish the designed grades beneath the site-wide building slabs.
- Forty-four (44) documentation samples were collected across the Site and analyzed to evaluate the performance of the remedy with respect to attainment of RRSCOs and/or PGWSCOs (VOCs only). Documentation sample frequency was based on the sampling frequency outlined in Section 5.4 of DER-10.
- A composite cover system consisting of minimum six-inch concrete building slabs or a minimum 2-foot-thick, clean soil cover in landscaped areas was constructed in the Track 4 area of the Site.
- Flood prevention measures were deployed at the Site during rain events to prevent soil/fill from exiting the Site during neighborhood-wide flash flood events.
- An Environmental Easement was executed and recorded to restrict land use and prevent future exposure to any contamination remaining at the Site.
- An SMP was developed and implemented for long-term management of remaining contamination, as required by the Environmental Easement. The SMP includes plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting.

3.0 AIR MONITORING

Community air monitoring will be conducted during all intrusive Site activities in compliance with the New York State Department of Health (NYSDOH) Generic CAMP and this Site-specific CAMP. The NYSDOH Generic CAMP is included as Attachment A. Real-time air monitoring for VOCs and dust at the perimeter of the exclusion zone will be performed as described below. Exceedances of CAMP action levels will be immediately reported to the NYSDEC and NYSDOH project managers, and CAMP reports will be included in the daily reports submitted to NYSDEC and NYSDOH.

3.1 Roving Air Monitoring

VOC Monitoring

Continuous monitoring for VOCs will be conducted during all ground intrusive activities, including excavation activities. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. VOCs will be monitored continuously at the downwind perimeter of the exclusion zone. Monitoring will be conducted with a PID equipped with a 10.6 electron Volt (eV) lamp capable of calculating 15-minute running average concentrations.

Periodic monitoring for VOCs will be conducted during any non-intrusive activities, such as the collection of excavation endpoint soil samples. Periodic monitoring may include obtaining measurements upon arrival at a location and upon leaving the location.

More frequent intervals of monitoring will be conducted if required, as determined by the Site Manager (SM), Project Environmental and Safety Manager (PESM), QA/QC Manager, and/or Remedial Engineer (RE). All PID readings will be recorded and available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, will also be recorded.

Particulate Monitoring

Continuous monitoring for particulates will be conducted during all ground intrusive activities and will involve the measurement of respirable dust. Community air monitoring for dust particulates will be conducted using an MIE 1000 Personal DataRam or equivalent to measure the concentration of airborne respirable particulates less than 10 micrometers in size (PM_{10}). The dust monitor will be capable of calculating 15-minute running average concentrations and equipped with an audible alarm to indicate an exceedance of action levels. Background readings and any readings that trigger response actions will be recorded in the project logbook, which will be available on-site for NYSDOH and/or NYSDEC review.

3.2 Fixed Air Monitoring Stations

A minimum of two fixed air monitoring stations will be operated at the Site during soil disturbing activities. One fixed air monitoring station each will be set up at the upwind and downwind perimeters of the exclusion zone during all ground intrusive activities and will continuously log VOC and particulate levels. Each fixed monitoring station will be fully enclosed and equipped with the following:

- A PID equipped with a 10.6 eV lamp capable of calculating 15-minute running average VOC concentrations;
- A TSI 8530 DustTrak II or equivalent dust monitor capable of measuring the concentration of airborne respirable particulates less than 10 micrometers in size (PM_{10}) and calculating 15-minute running average particulate concentrations; and

- A Netronix™ Thiamus™ ICU-820 or equivalent Global System for Mobile Communication (GSM)/Global Positioning System (GPS) device capable of recording air monitoring and location data.

Each monitoring station will be capable of sending e-mail alerts to the PESM and SM to indicate an exceedance of action levels. Additionally, the Site Safety Officer (SSO) will inspect the monitoring stations on at least an hourly basis. Upon completion of Site activities, all air monitoring data will be available to download via the iEnvironet® website. All air monitoring data recorded at the fixed monitoring stations will be available for NYSDOH and/or NYSDEC review and will be included in the Periodic Review Report (PRR).

Since work areas at this Site may be within 20 feet of potentially exposed populations, additional Site-specific CAMP air monitoring provisions will be implemented (as necessary) to ensure that residents of the northeast-adjacent structure are not exposed to Site-related contaminants during construction activities. The additional CAMP provisions include:

- Potential use of ECs such as vapor/dust barriers or special ventilation devices; and
- Attempting to implement planned activities when potentially exposed populations are at a minimum.

3.3 Community Air Monitoring Action Levels

VOC Action Levels

The following actions will be taken based on organic vapor levels measured:

- If total organic vapor levels exceed 5 parts per million (ppm) above background for the 15-minute average at the exclusion zone perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the exclusion zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less (but in no case less than 20 feet), is below 5 ppm above background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the exclusion zone, activities will be shutdown.

Particulate Action Levels

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

- If the downwind particulate concentrations are greater than 100 micrograms per cubic meter ($\mu g/m^3$) above background (upwind concentrations), and no other obvious source is apparent, then it will be assumed that the elevated particulate concentrations are a result of Site activities. In such instances, dust suppression measures will be implemented and monitoring will be continued. Work will be allowed to continue with dust suppression if downwind particulate levels do not exceed 150 $\mu g/m^3$ above the background (upwind concentration) and provided that no visible dust is migrating from the work area.
- If particulate levels persist at 150 $\mu g/m^3$ above the background, work must be stopped until dust suppression measures bring particulate levels to below 150 $\mu g/m^3$ above background.

Major Vapor Emission Response Plan

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the Site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted and/or vapor controls must be implemented.

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

If either of the following criteria is exceeded in the 20-foot zone, then the Major Vapor Emission Response Plan shall automatically be implemented:

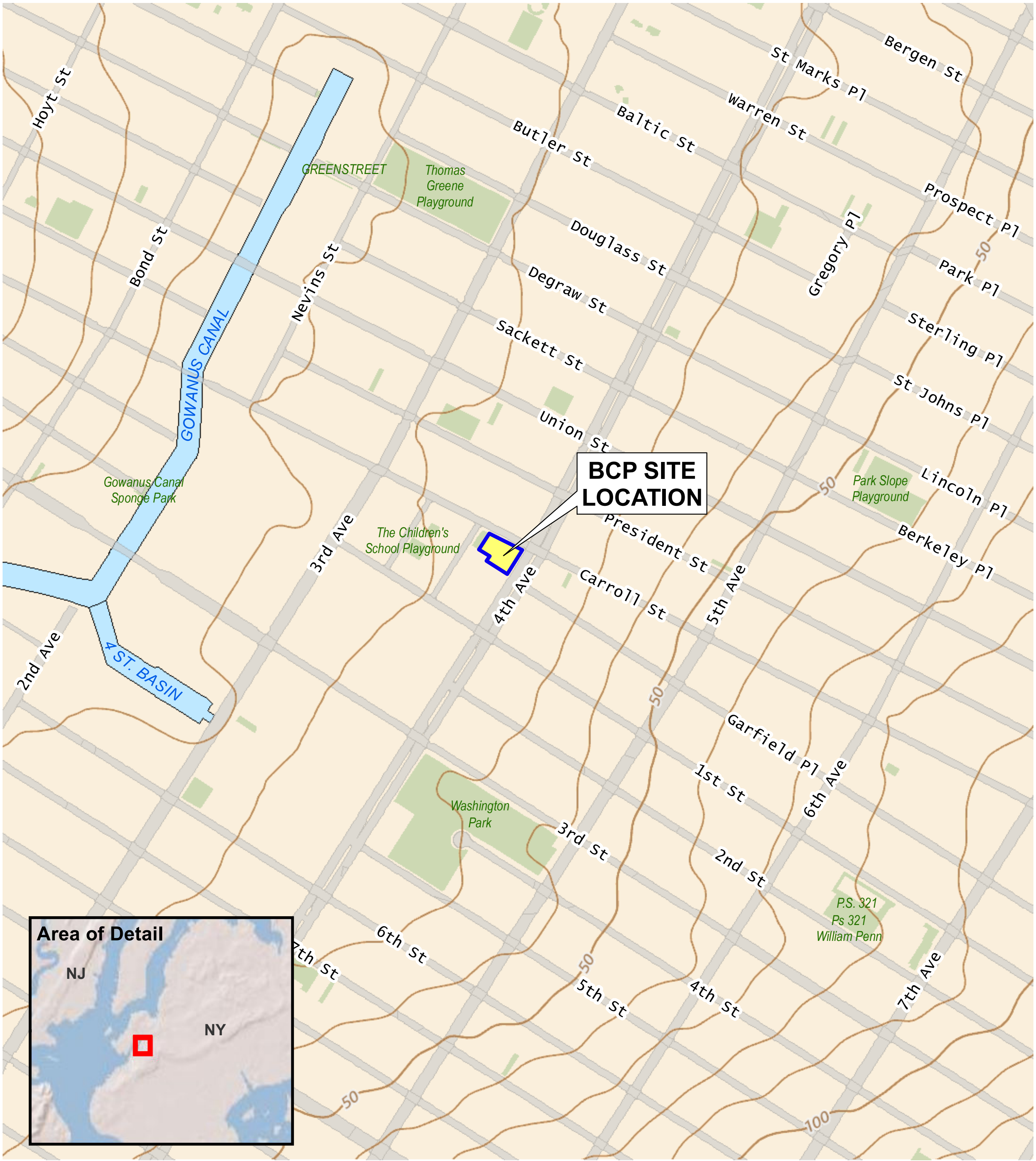
- Sustained organic vapor levels approaching 1 ppm above background for a period of more than 30 minutes; or
- Organic vapor levels greater than 5 ppm above background for any time period.

Upon activation, the following activities shall be undertaken as part of the Major Vapor Emission Response Plan:

- NYSDEC, NYSDOH, and local police authorities will be immediately contacted by the SM or PESM and advised of the situation;
- Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the PESM and/or SM; and
- All emergency contacts will go into effect as appropriate.

All readings will be recorded and available for NYSDEC and NYSDOH personnel to review.

FIGURE



Service Layer Credits: USGS The National Map: 3d Elevation Program,
Data Refreshed July, 2020

0 600 1,200
SCALE IN FEET

AKRF
440 Park Avenue South, New York, NY 10016

272 4th Ave
Brooklyn, New York

SITE LOCATION

DATE
9/24/2021

PROJECT NO.
190021

FIGURE
1

©2021 AKRF W:\Projects\190021 - 272 4TH AVENUE\Technical\GIS and Graphics\hazmat\RAWP\190021 Fig 1 BCP Site Location map.mxd9/24/2021 10:01:40 AM jszalus

APPENDIX A
NYSDOH GENERIC CAMP

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

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

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

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

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

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

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

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

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

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

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

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

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

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

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

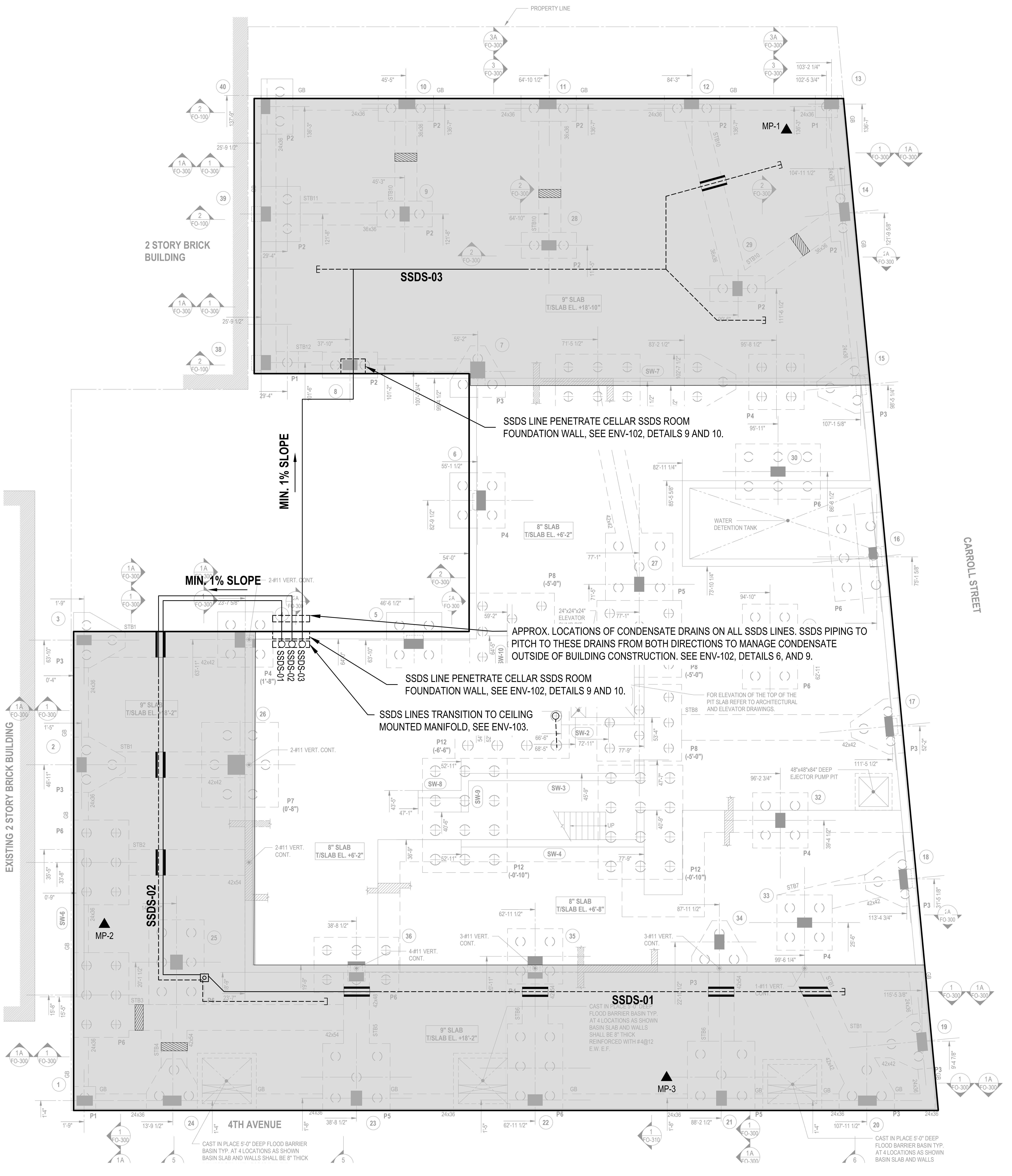
(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation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

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

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

APPENDIX G

AS-BUILT SSDS DRAWINGS



SSDS LINE PENETRATE CELLAR SSDS ROOM FOUNDATION WALL, SEE ENV-102, DETAILS 9 AND 10.

APPROX. LOCATIONS OF CONDENSATE DRAINS ON ALL SSDS LINES. SSDS PIPING TO PITCH TO THESE DRAINS FROM BOTH DIRECTIONS TO MANAGE CONDENSATE OUTSIDE OF BUILDING CONSTRUCTION. SEE ENV-102, DETAILS 6, AND 9.

SSDS LINE PENETRATE CELLAR SSDS ROOM FOUNDATION WALL, SEE ENV-102, DETAILS 9 AND 10.

SSDS LINES TRANSITION TO CEILING MOUNTED MANIFOLD, SEE ENV-103.

1 / ENV-100 SUBSLAB DEPRESSURIZATION SYSTEM LAYOUT

0 2.5 5 10
SCALE IN FEET

NOTE: PIPE SPACING NOT TO SCALE

NOTES

1. THIS PLAN SHALL NOT TO BE USED FOR STRUCTURAL, ARCHITECTURAL OR OTHER REFERENCE PURPOSES EXCEPT FOR THE VENTING SYSTEM AND VAPOR BARRIER.

2. COORDINATE ALL WORK FOR VENTING SYSTEM INSTALLATION WITH OTHER TRADES BEFORE INSTALLATION.

3. THE FULL EXTENTS OF THE BUILDING CONSTRUCTION BENEATH THE FLOOR SLABS SHALL BE LINED WITH GAS PERMEABLE AGGREGATE AND VAPOR BARRIER EXCEPT AS NOTED ON THIS DRAWING. ALL DEVIATIONS SHALL BE PROPOSED IN SHOP DRAWING SUBMITTALS PRIOR TO INSTALLATION IN THE FIELD.

4. SLOPE SOLID HORIZONTAL VENTING SYSTEM PIPE A MINIMUM OF 1% UNIFORMLY TOWARDS THE VENTING SYSTEM SLOTTED PIPING OR CONDENSATE DRAINS.

5. SSDS PIPE PENETRATION INTO CELLAR SSDS ROOM TO BE MADE AT AN ELEVATION SUCH THAT SSDS MANIFOLD CAN BE INSTALLED WITH A MINIMUM OF 12 INCHES OF CLEARANCE BETWEEN THE BOTTOM OF CELLAR CEILING AND TOP OF SSDS PIPE (SEE ENV-103, DETAILS 3 AND 3A), AND SUCH THAT PIPING CAN BE PITCHED TOWARDS CONDENSATE DRAIN LOCATIONS ON EXTERIOR SIDE OF CELLAR FOUNDATION WALL PENETRATION (SEE ENV-102, DETAILS 9 AND 10).

6. ADDITIONAL CONDENSATE DRAINS MAY BE NECESSARY AS PART OF PIPE ELEVATION DESIGN AND CONSTRUCTION PHASE ADJUSTMENTS. ANY ADDITIONALLY REQUIRED CONDENSATE DRAIN LOCATIONS SHALL BE PROPOSED AND PRESENTED BY THE CONTRACTOR IN A SHOP DRAWING PRIOR TO FIELD IMPLEMENTATION.

7. REFER TO DRAWING ENV-101, 102, 103 FOR SSDS DETAILS.

8. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AGAINST ARCHITECTURAL AND BUILDING PLANS. NOTIFY ENGINEER OF ANY DISCREPANCY PRIOR TO CONSTRUCTION.

9. BASE MAP FROM FOUNDATION PLAN - CELLAR, SHEET No. FO-100.00, DATED 05-01-2023.

10. CONTRACTOR TO SUBMIT SHOP DRAWING IDENTIFYING PROPOSED CONDENSATE DRAIN LOCATIONS FOR APPROVAL BY ENGINEER.

11. GAS PERMEABLE AGGREGATE SHALL HAVE NOMINAL SIZE OF 1 INCH TO 1/2 INCH AND COMFORM TO ASTM C33 STANDARD SPECIFICATION FOR CONCRETE AGGREGATE SIZE #5 AS PER THE TABLE BELOW:

ASTM #5 AGGREGATE GRADATION
(FOR PIPE TRENCHES)

SIEVE SIZE	PERCENT FINER BY WEIGHT
1.5 inch	100
1 inch	90 to 100
3/4 inch	20 to 55
1/2 inch	0 to 10
3/8 inch	0 to 5

MONITORING POINT LOCATIONS

ID	BUILDING ROOM NAME
MP–1	RETAIL, WEST OF COLUMN 21
MP–2	RETAIL, BETWEEN COLUMNS 1 AND 2
MP–3	GYM, WEST OF COLUMN 13

LEGEND

▭	EXTENT OF VAPOR BARRIER
■	EXTENT OF GAS PERMEABLE AGGREGATE UNDER SLAB
═	PIPE SLEEVE THROUGH FOUNDATION ELEMENT (SEE DETAIL 4 ON ENV-102)
▨	COMMUNICATION SLEEVE THROUGH FOUNDATION ELEMENT (SEE DETAIL 5 ON ENV-102)
- - - -]	4" Ø SLOTTED SCHEDULE 40 PVC PIPE WITH PVC END CAP
——	4" Ø SOLID SCHEDULE 40 PVC PIPE
⊡	CONDENSATE DRAIN
▲ MP-1	VACUUM MONITORING POINT (SEE DETAIL 8 ON ENV-102)

PROJECT NAME:

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No.	DATE	DESCRIPTION
	08-11-2023	ASI-3
	07-14-2023	ASI-2
	04-26-2023	DOB RESUBMISSION
	03-24-2023	ISSUE FOR CONSTRUCTION
	12-23-2022	80% CD
	11-04-2022	50% CD
	09-02-2022	100% SCHEMATIC DESIGN (MTA AIR RIGHTS)
	04-29-2022	ISSUE FOR CONSTRUCTION
	03-11-2022	80% CD
	01-07-2022	50% CD
	12-10-2021	EARLY ISSUANCE
	12-10-2021	DOB SUBMISSION
	09-24-2021	100% DESIGN DEVELOPMENT
	08-13-2021	50% DESIGN DEVELOPMENT

REVISIONS

DOB APPROVAL STAMP:

DOB NOW JOB #: B00645685-P5

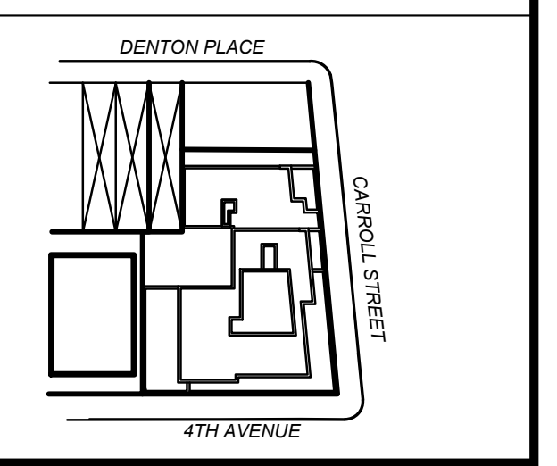
SCALE:

DATE:

DRAWN BY: MRV
CHECKED BY: EP

PROJECT NUMBER:

KEY PLAN:

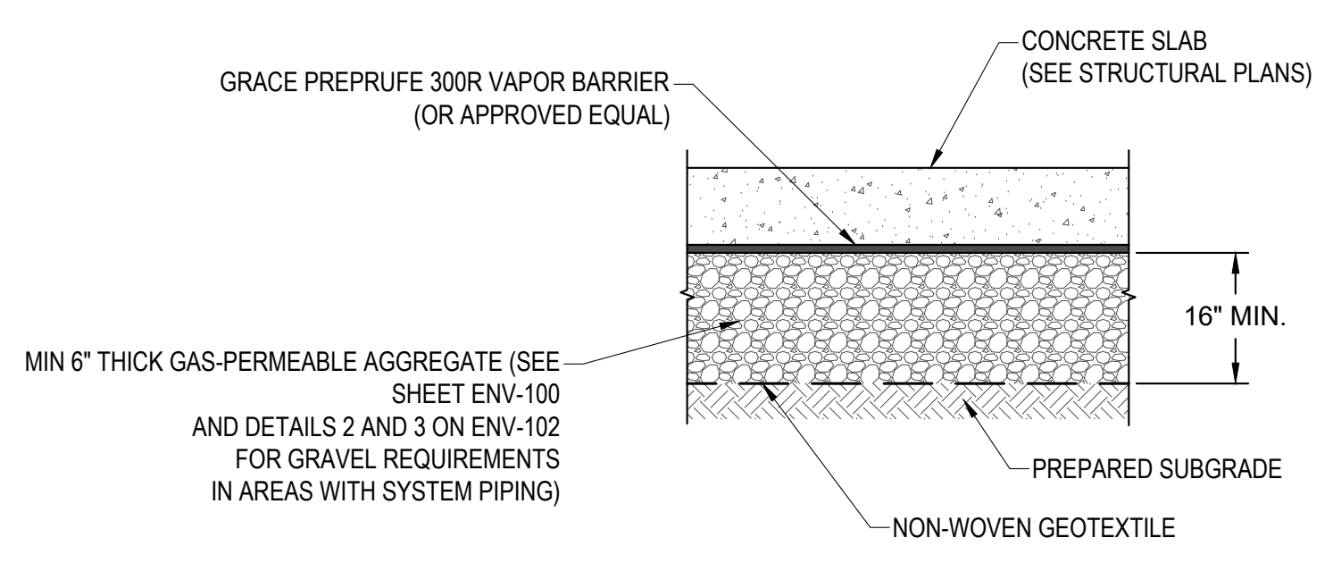


ARCHITECT SEAL:

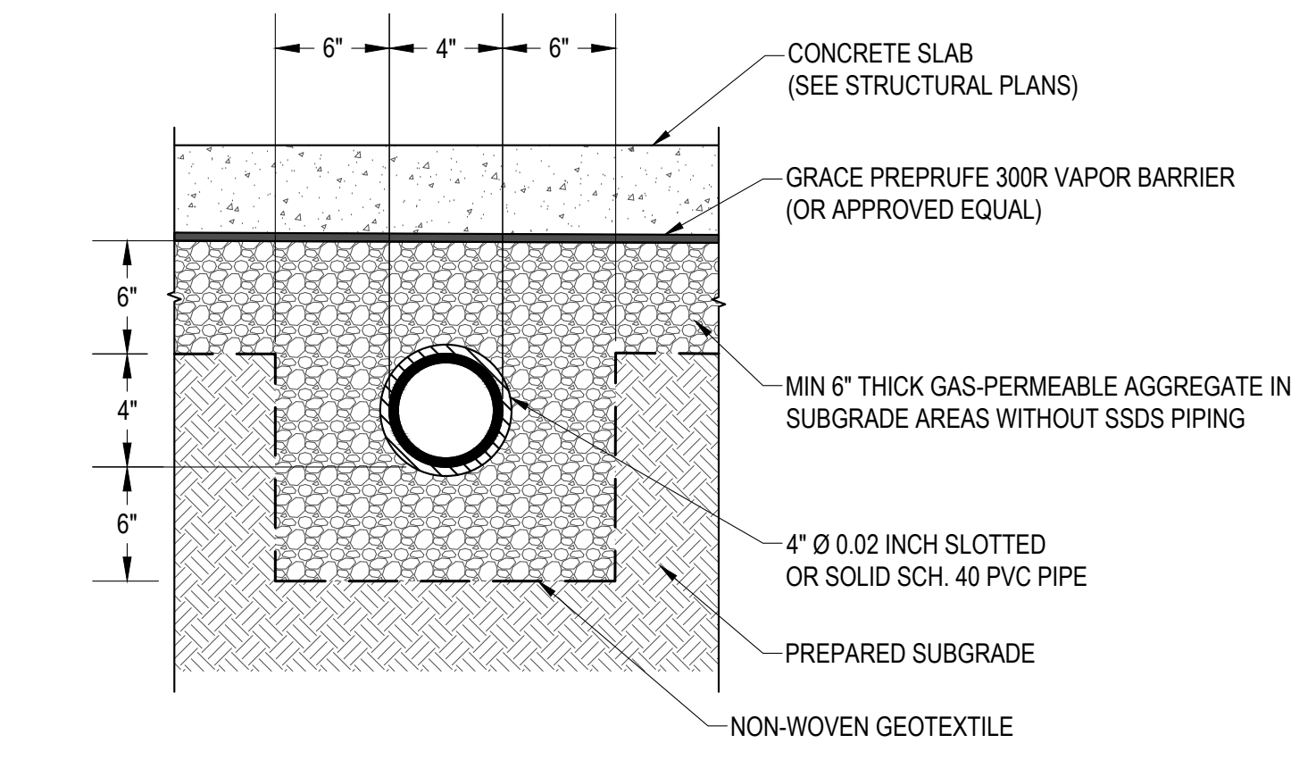
STATE OF NEW YORK
REBECCA A. KINAL
082046-1
LICENSED PROFESSIONAL ENGINEER

DRAWING TITLE:
**AS-BUILT
SSDS AND
VAPOR BARRIER PLAN**

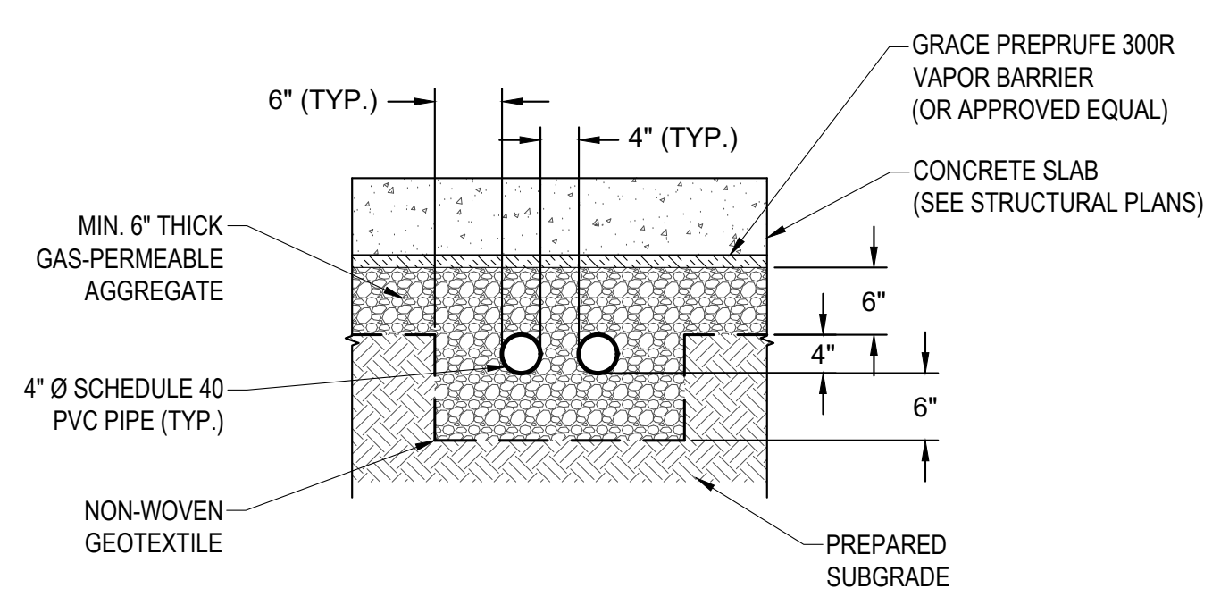
SHEET NUMBER:
ENV-100



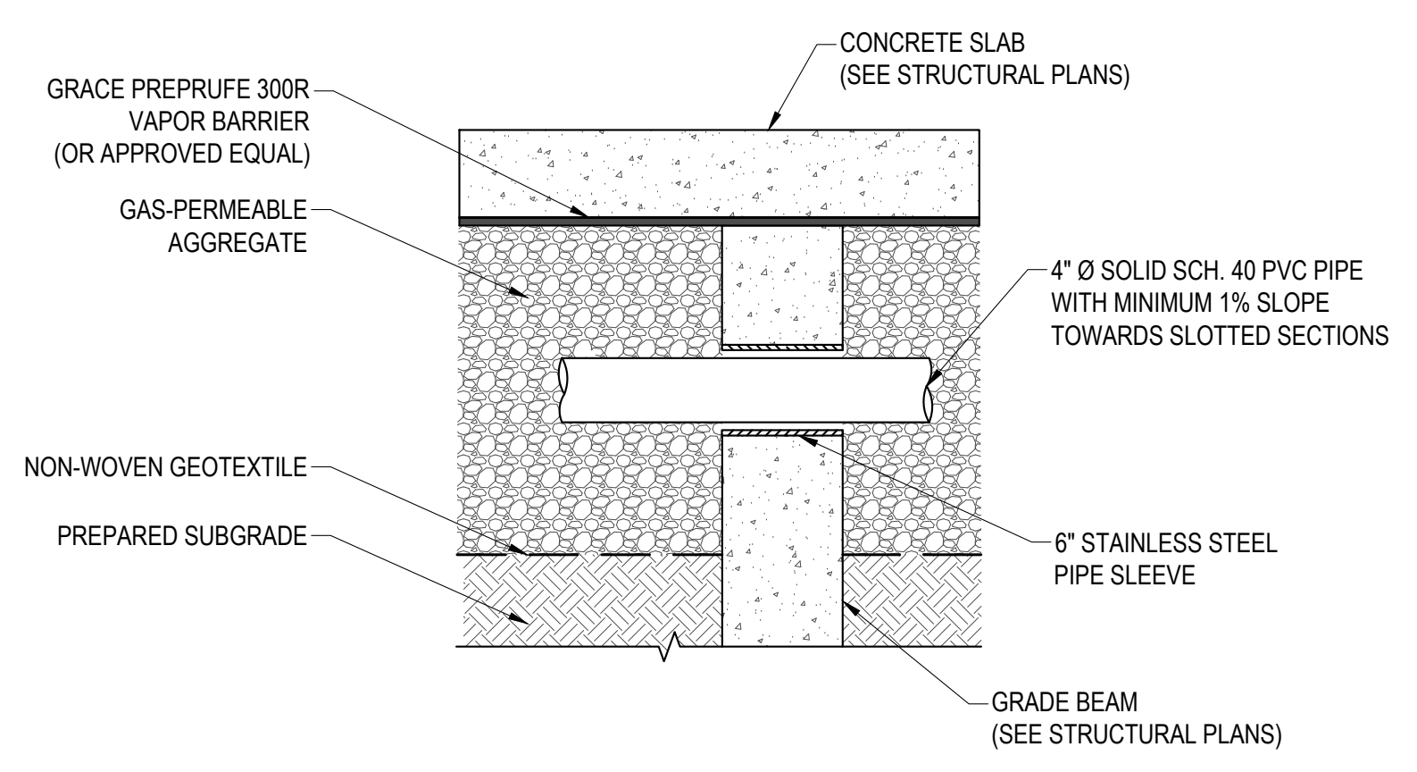
1 TYPICAL SECTION THROUGH SUB-SLAB
ENV-102 Not to Scale



2 TYPICAL PIPE TRENCH AND SUBGRADE CONSTRUCTION DETAIL
ENV-102 Not to Scale



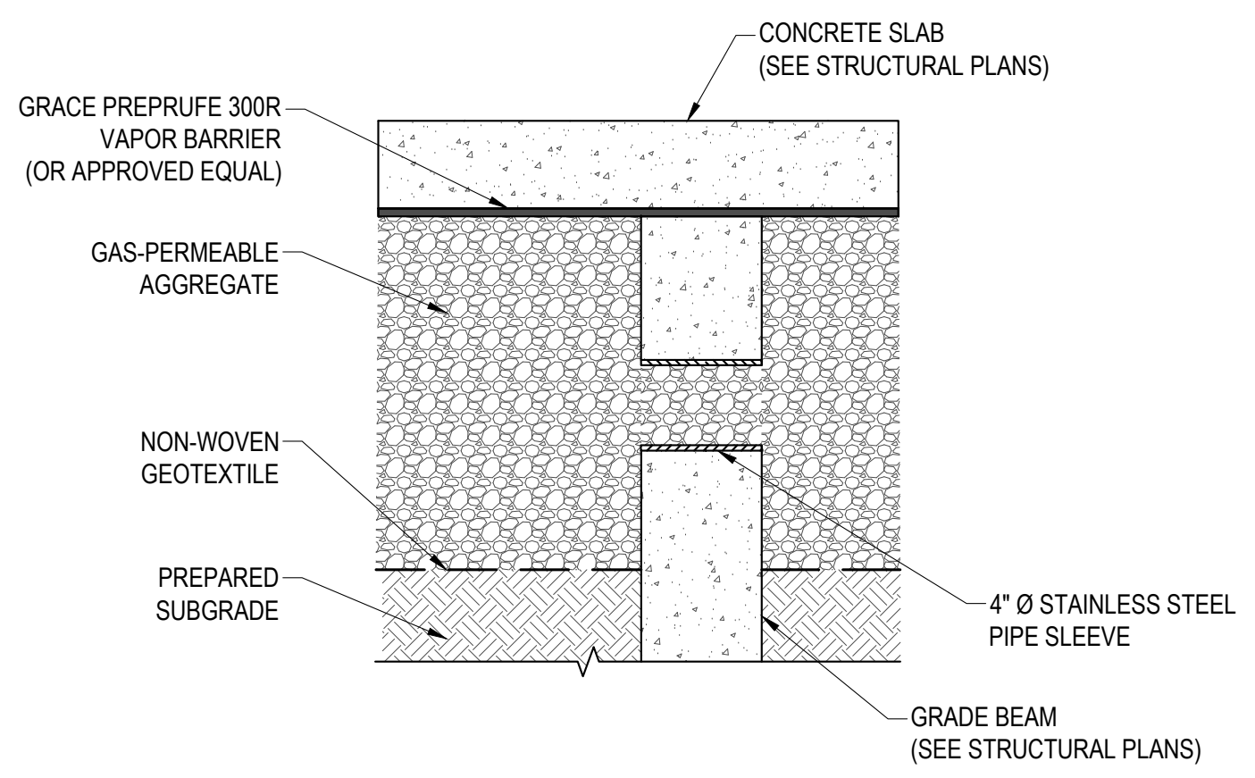
3 TYPICAL PIPING TRENCH WITH MULTIPLE SSDS PIPES
ENV-102 Not to Scale



4 TYPICAL PIPE SLEEVE THROUGH FOUNDATION ELEMENT
ENV-102 Not to Scale

NOTE:

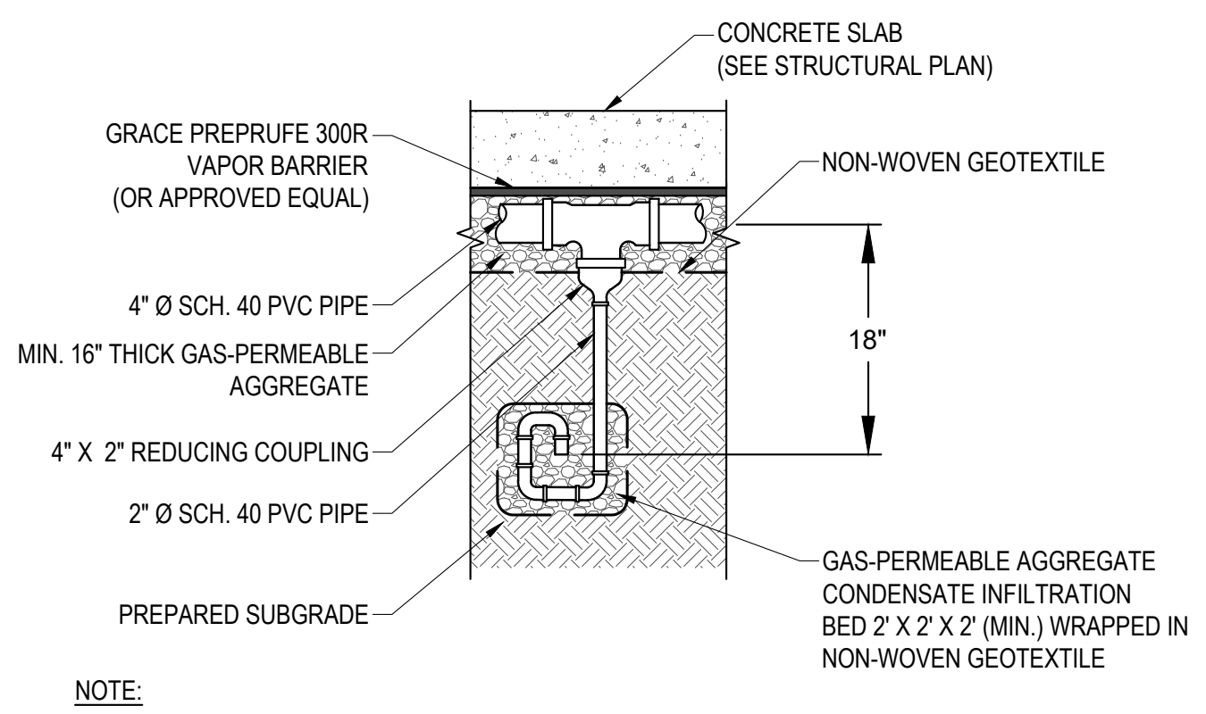
1. CONTRACTOR TO COORDINATE PENETRATIONS THROUGH MAT SLABS WITH STRUCTURAL ENGINEER TO AVOID STRUCTURAL REBAR.



5 TYPICAL COMMUNICATION SLEEVE DETAIL
ENV-102 Not to Scale

NOTE:

1. CONTRACTOR TO COORDINATE PENETRATIONS THROUGH MAT SLABS WITH STRUCTURAL ENGINEER TO AVOID STRUCTURAL REBAR.

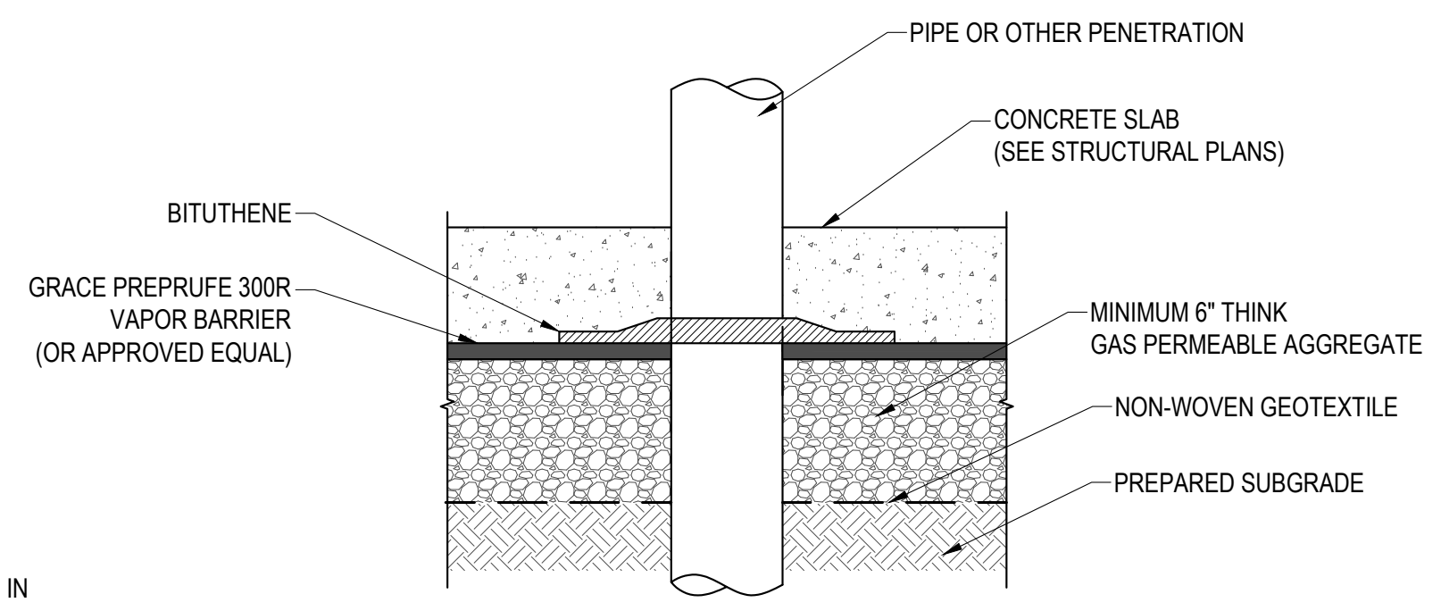


NOTE:

1. INSTALL, AS NECESSARY (INCLUDING AS SPECIFIED IN ENV-100, AND ENV-102, DETAIL 9), AT ALL LOW POINTS IN SUB-SLAB DEPRESSURIZATION SYSTEM PIPING WHEN PIPING CANNOT BE SLOPED TO SLOTTED PIPING.

2. ADDITIONAL CONDENSATE DRAINS MAY BE NECESSARY AS PART OF PIPE PITCH DESIGN AND CONDENSATE MANAGEMENT. ANY ADDITIONALLY REQUIRED CONDENSATE DRAIN LOCATIONS SHALL BE PROPOSED AND PRESENTED BY THE CONTRACTOR IN A SHOP DRAWING PRIOR TO FIELD IMPLEMENTATION.

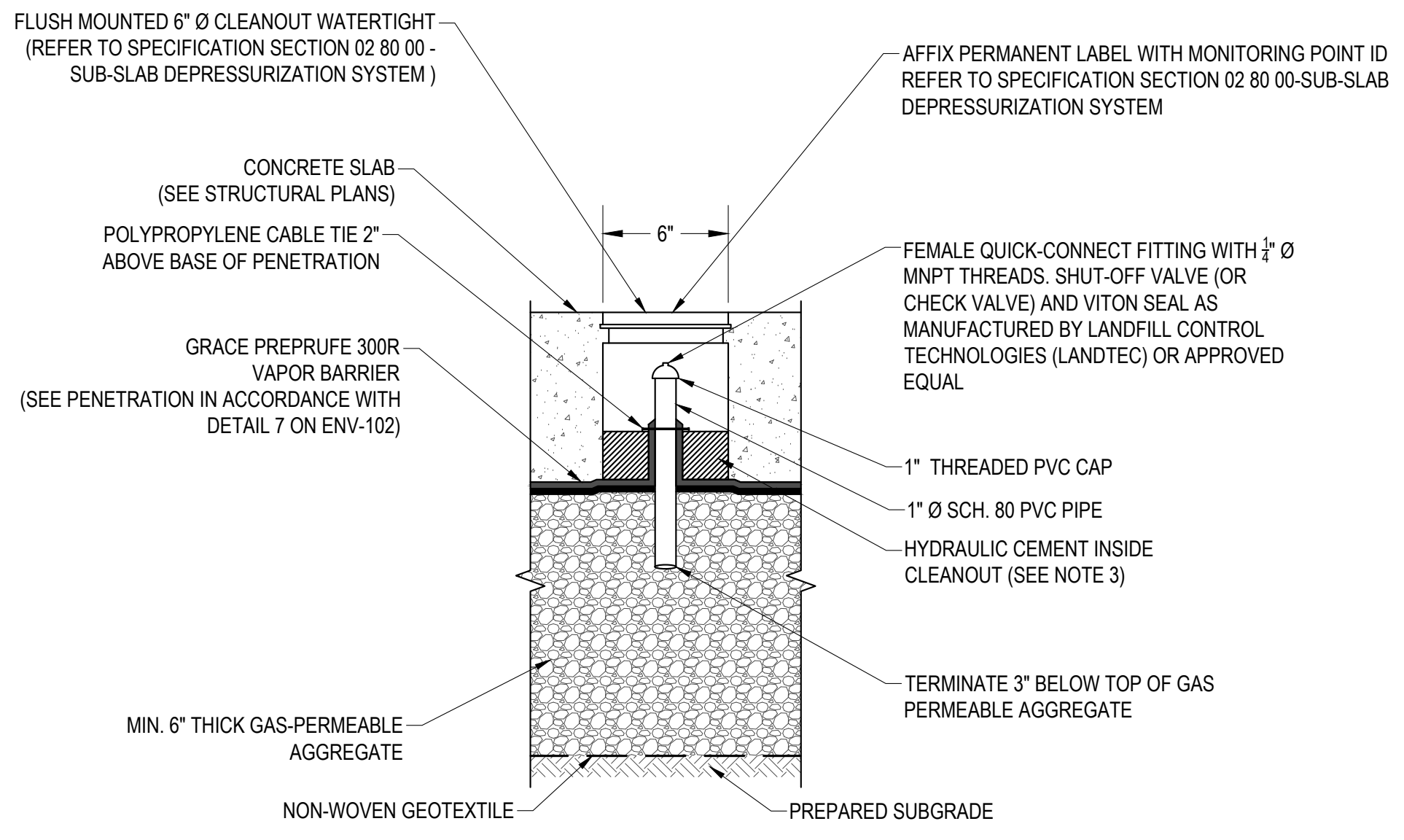
6 TYPICAL CONDENSATE DRAIN DETAIL
ENV-102 Not to Scale



NOTE:

1. SEAL WATERPROOFING PENETRATIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

7 TYPICAL WATERPROOFING PENETRATION
ENV-102 Not to Scale



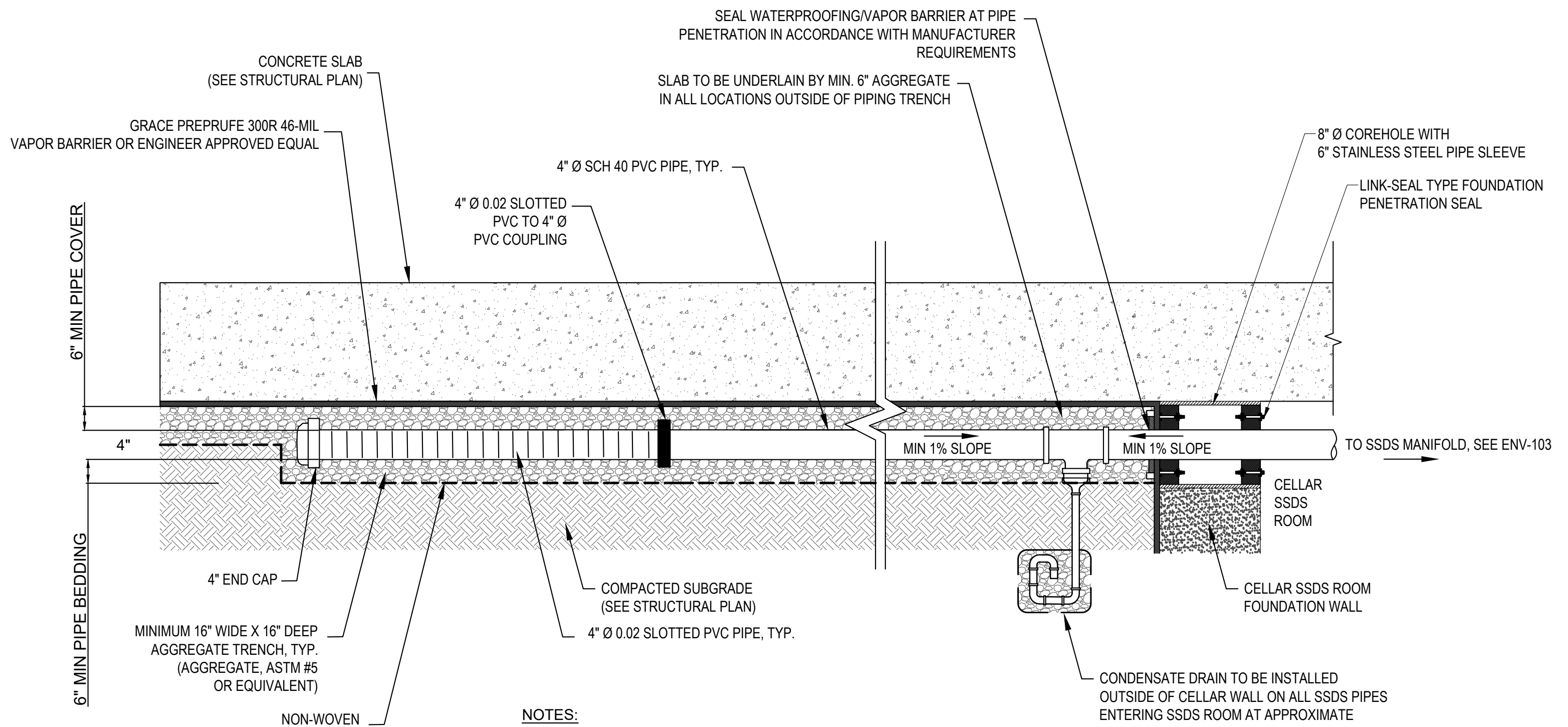
NOTES:

1. ANY DEVIATION FROM THIS INSTALLATION MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

2. REFER TO SECTION 02 80 00 FOR TYPICAL MONITORING POINT ACCESS COVER SPECIFICATION.

3. THREE INCHES OF HYDRAULIC CEMENT TO BE POURED INSIDE CLEANOUT OVER PROPERLY SEALED PENETRATION.

8 TYPICAL VACUUM MONITORING POINT
ENV-102 Not to Scale



NOTES:

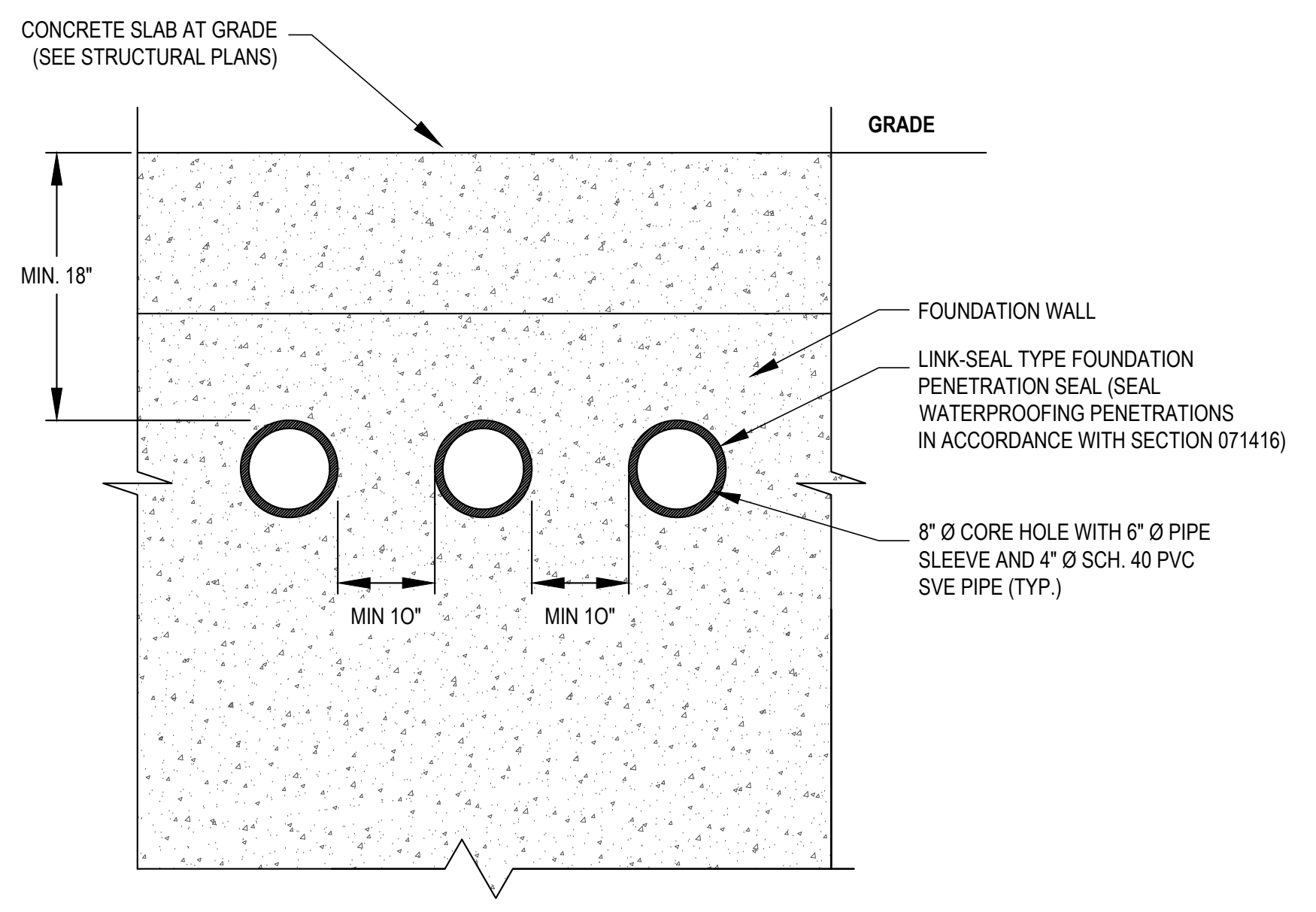
1. SEE ENV-100 FOR APPROXIMATE LOCATION OF CONDENSATE DRAINS WEST OF SSDS ROOM. ADDITIONAL CONDENSATE DRAINS MAY BE NECESSARY AS PART OF PIPE ELEVATION DESIGN AND CONSTRUCTION PHASE ADJUSTMENTS.

2. ANY ADDITIONALLY REQUIRED CONDENSATE DRAIN LOCATIONS SHALL BE PROPOSED AND PRESENTED BY THE CONTRACTOR IN A SHOP DRAWING PRIOR TO FIELD IMPLEMENTATION.

3. SEE ENV-102, DETAIL 10 FOR ELEVATION VIEW OF CELLAR FOUNDATION WALL PENETRATION.

4. SEE ENV-103 FOR SSDS PROCESS AND INSTRUMENTATION DIAGRAM AND PIPING MANIFOLD DETAILS.

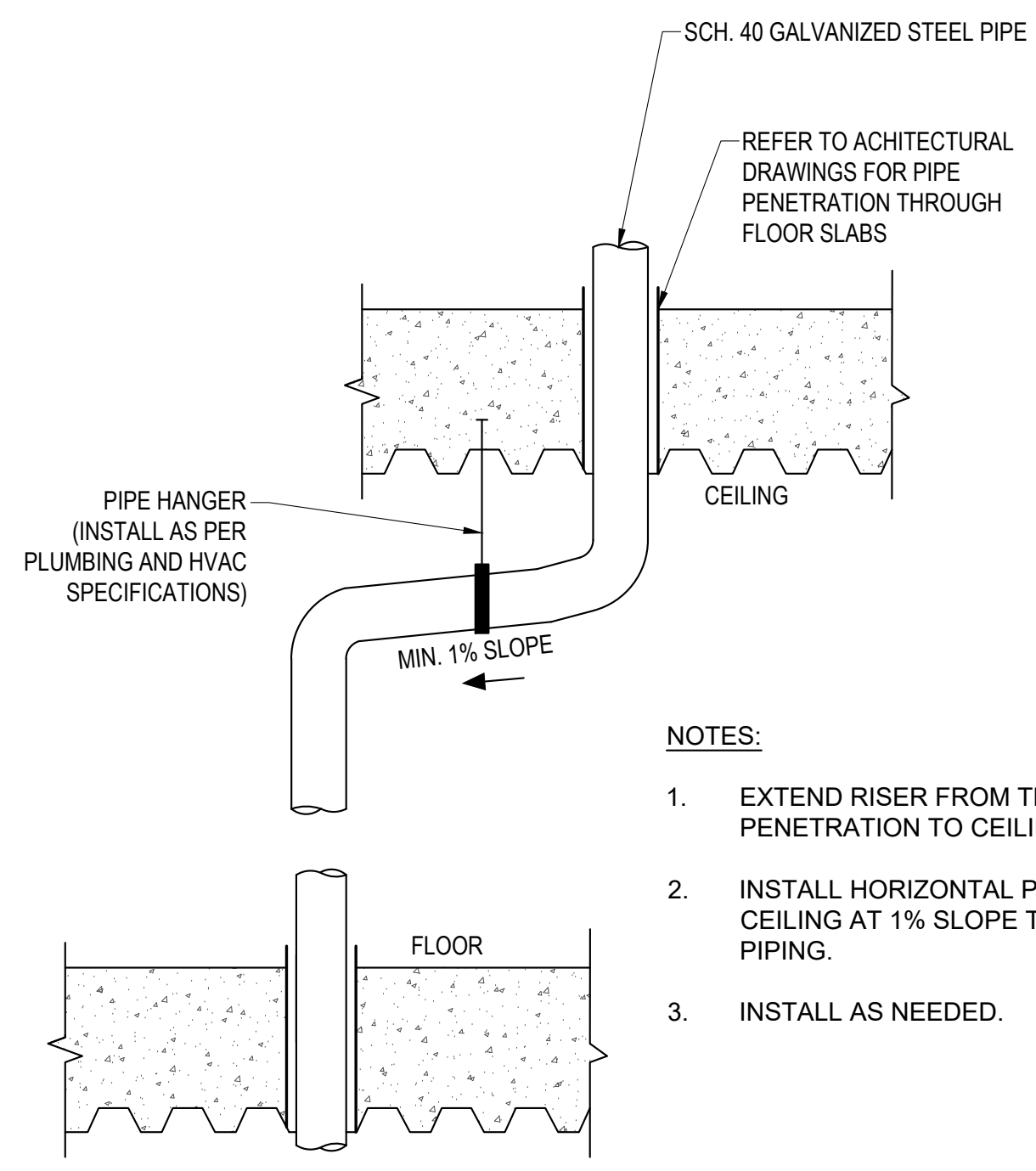
9 TYPICAL SSDS PIPING PROFILE AT SSDS ROOM PENETRATION AND OTHER FOUNDATION WALLS
ENV-102 Not to Scale



NOTE:

1. LINK-SEAL AND PIPE SLEEVE TO ALSO BE USED AT SSDS-03 PENETRATION THROUGH NORTHERN FOUNDATION WALL.

10 ELEVATION VIEW OF SSDS PIPE PENETRATION INTO EQUIPMENT ROOM THROUGH FOUNDATION WALL (VIEW FACING SOUTH)
ENV-102 Not to Scale



NOTES:

1. EXTEND RISER FROM THE FLOOR PENETRATION TO CEILING.

2. INSTALL HORIZONTAL PIPING BENEATH CEILING AT 1% SLOPE TOWARD SLOTTED PIPING.

3. INSTALL AS NEEDED.

11 TYPICAL PIPING OFFSET
ENV-102 Not to Scale

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No.	DATE	DESCRIPTION
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	08-13-2021	50% DESIGN DEVELOPMENT

REVISIONS

DOB APPROVAL STAMP:

DOB NOW JOB #: B00645685-P5

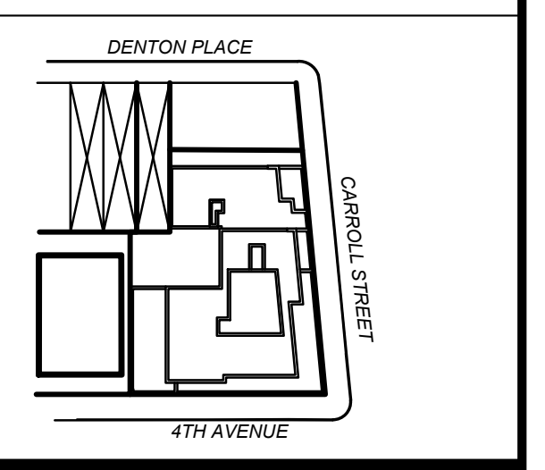
SCALE:

DATE:

DRAWN BY: MRV
CHECKED BY: EP

PROJECT NUMBER:

KEY PLAN:



ARCHITECT SEAL:

REBECCA A. KINAL
082046-1

DRAWING TITLE: AS-BUILT
SSDS DETAILS

SHEET NUMBER:
ENV-102

APPENDIX H

QUALITY ASSURANCE PROJECT PLAN

272 4TH AVENUE

BROOKLYN, NEW YORK

Quality Assurance Project Plan

NYSDEC Site Number: C224298
AKRF Project Number: 190021

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau B
625 Broadway, 12th Floor
Albany, New York 12233

On Behalf Of:

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272 4th Avenue LLC
274 4th and 538 Carroll LLC
51 East 12th Street, 7th Floor
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Prepared by:

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DECEMBER 2024

TABLE OF CONTENTS

TABLES

ATTACHMENT

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of the Site Management Plan (SMP) and associated appendices at the approximately 0.347-acre property located at 272 4th Avenue in the Gowanus neighborhood of Brooklyn, New York (hereinafter referred to as the Site). The Site, which is identified on the New York City Tax Map as Block 456, Lot 13, was remediated under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) (BCP Site No. C224298).

The objective of this QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) during sampling performed to evaluate the performance and effectiveness of the remedy designed to reduce or mitigate contamination at the Site. Adherence to the QAPP will ensure that defensible data will be obtained to confirm the successful operation and maintenance of remedial systems.

2.0 PROJECT TEAM

The project team will be drawn from AKRF professional and technical personnel and AKRF's subcontractors. All field personnel and subcontractors will have completed a 40-hour training course and updated 8-hour refresher course that meets the Occupational Safety and Health Administration (OSHA) requirements of 29 Code of Federal Regulation (CFR) Part 1910. The following sections describe the key project personnel and their responsibilities.

2.1 Remedial Engineer

Ms. Rebecca A. Kinal, P.E. will serve as the Remedial Engineer (RE) for the project throughout site management. Ms. Kinal served as the RE during Site remediation and oversaw the design of all Institutional Controls (ICs) and Engineering Controls (ECs) at the Site. She will oversee operation and maintenance (O&M) of ECs under the SMP. Ms. Kinal's resume is included in Attachment A.

2.2 Project Manager

Mr. Patrick Diggins will serve as the Project Manager throughout site management. The project manager will be responsible for directing and coordinating all elements of the SMP. The project manager will prepare reports and participate in meetings with the Site owner and/or NYSDEC. Mr. Diggins's resume is included in Attachment A.

2.3 Field Team Leader

The field team leader will be responsible for supervising the daily sampling and health and safety activities in the field and will ensure adherence to the SMP. The field team leader will report to the project manager on a regular basis regarding daily progress and any deviations from the SMP. The field team leader will be a qualified, responsible person able to act professionally and promptly during required activities. The field team leader will be established for each task; however, Mr. Michael Bates is expected to be the field team leader for much of the work under the SMP. Mr. Bates's resume is included in Attachment A.

2.4 Project Quality Assurance/Quality Control Officer

Mr. Marc Godick will be the Project QA/QC Officer throughout site management. The QA/QC Officer will be responsible for adherence to this QAPP. The QA/QC officer will review the procedures with all personnel prior to commencing any fieldwork and will assess implementation of the required procedures. Mr. Godick's resume is included in Attachment A.

2.5 Laboratory Quality Assurance/Quality Control Officer

The laboratory QA/QC officer, James Todaro of Pace Analytical Services (formerly Alpha Analytical Laboratories, Inc.), will be responsible for QC procedures and checks in the laboratory and ensuring adherence to laboratory protocols. They will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued. The laboratory QA/QC officer will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be determined upon selection of a contract laboratory(s) for the SMP.

2.6 Third Party Validator

The anticipated third-party validator will be Lori Beyer of L.A.B. Validation Corp. Each of the samples collected will undergo a third-party data review process to ensure the usability of the data collected. Data usability summary reports (DUSRs) documenting any issues with QA/QC will be prepared by the third-party validator.

3.0 STANDARD OPERATING PROCEDURES

The following sections describe the Standard Operating Procedures (SOPs) for the monitoring activities included in the SMP. During these operations, all field personnel will wear appropriate personal protective equipment (PPE) and safety monitoring will be performed as described in the Site-specific Health and Safety Plan (HASP) provided as Appendix F of the SMP. SMP implementation will include sampling associated with the O&M of the sub-slab depressurization system (SSDS), if required. The SMP also requires inspections of the SSDS and Site cover system, as well as an Excavation Work Plan (EWP) and other provisions and appropriate actions to be taken in the event that future renovation or redevelopment of the Site requires the breaching of the site cover system and excavation/removal of underlying soil/fill.

In all instances, any atypical or unexpected findings noted during inspections, sampling events, or SMP-governed field work will be communicated immediately to the environmental professional managing the Site work and, as necessary, to the NYSDEC project manager or NYSDEC's successor agency.

3.1 Excavation and/or Site Cover System Disturbance

The procedures for excavation and/or other invasive work that may disturb remaining contamination beneath the Site cover system will be as follows:

- Soil removal and/or other invasive activities will be completed as needed in accordance with the SMP and EWP;
- Following invasive work, the demarcation layer will be replaced to provide a visual reference to the top of the residual management zone (RMZ);
- The Site cover system will be replaced to restore the condition that existed prior to the excavation. In general, the restoration types must match or exceed the existing material and thickness conditions of the Site cover types presented in the SMP to maintain cover system integrity across the entire Site; and
- All equipment used in cover system disturbance will be decontaminated as described in Sections 3.2 and 3.3 of this QAPP.

3.2 Decontamination of Sampling Equipment

All sampling equipment (drilling rods and casing, macrocore samplers, probe rods, etc.) will be either dedicated or decontaminated between sampling locations. The decontamination procedure will be as follows:

1. Scrub using a tap water/Alconox™ mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with a tap water/Alconox™ mixture and bristle brush.
4. Rinse with distilled water.
5. Air-dry the equipment, if possible.

Decontamination will be conducted within 55-gallon drums or on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground or drains.

3.3 Heavy Equipment Decontamination

Decontamination of chemically contaminated heavy equipment (e.g., augers, excavator buckets) will be accomplished using high-pressure steam or dry decontamination with brushes and shovels. Decontamination will take place on a decontamination pad and all liquids used in the decontamination procedure will be collected, stored, and disposed of in accordance with federal, state, and local regulations. Vehicles or equipment brought into an exclusion zone will be treated as contaminated and will be decontaminated prior to removal. Personnel performing this task will wear the proper PPE, as prescribed in the Site-specific HASP.

A decontamination area will be established around the planned excavation area, adjacent to the environmental enclosure. The floor of the decontamination area will be covered with 6-mil plastic sheeting, as necessary, and bermed to prevent spreading of decontamination fluids or potential discharge to the ground surface.

All equipment in direct contact with known or potentially contaminated material will be either dedicated or decontaminated prior to handling less contaminated material or removal from the Site.

3.4 Management of Investigation-Derived Waste and Remedial Operation and Maintenance Waste

Any Investigation-Derived Waste (IDW) and remedial O&M waste will be containerized in New York State Department of Transportation (NYSDOT)-approved 55-gallon drums or other appropriate containers. The drums will be sealed at the end of each workday and labeled with the date, the well or boring number(s), the type of waste (i.e., drill cuttings, development water, or purge water), and the name of an AKRF point-of-contact. Drums will be staged in secure areas away from public access, to the extent practicable.

Soil/fill samples collected from soil boring or excavation activities will be used for waste characterization of soil/fill, since such data would be biased towards areas which are expected to be most contaminated. Additional waste characterization soil or other samples may be collected, if requested by the disposal facility. All IDW and remedial waste will be disposed of or treated according to applicable local, state, and federal regulations.

4.0 SAMPLING AND LABORATORY PROCEDURES

4.1 Import Soil/Fill Sampling

Prior to importing soil/fill for use as backfill, the intended imported material will be evaluated using the following procedures:

- A segregated stockpile of the intended imported material will be made available for sampling at a frequency and for the required parameters as outlined in Section 5.4(e) 10 of NYSDEC DER-10, and/or the NYSDEC-issued Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substance (PFAS), dated April 2023;
- Soil/fill sample(s) will be collected from the segregated stockpile for analysis in accordance with NYSDEC requirements, and sampling results will be submitted to NYSDEC for approval;
- No material will be added to or removed from the segregated stockpile intended for import following the sample collection;
- Samples will be collected into laboratory-supplied containers;
- Samples will be kept in an ice-filled cooler or refrigerator, with the exception of any asbestos samples, until receipt by the laboratory (blue ice cannot be used when sampling for PFAS);
- The clean soil/fill layer will be underlain by a demarcation layer such as orange snow fencing to indicate the top of the original soil/fill; and
- All sampling equipment will be decontaminated between sampling locations, as described in Sections 3.2 and 3.3 of this QAPP.

Collection of Samples for PFAS Sample Protocol:

- Samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 1633. The sampling procedure used will be consistent with the NYSDEC-issued Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substance (PFAS), dated April 2023, including:
  - At this time acceptable materials for sampling include: stainless steel, high density polyethylene (HDPE), and polypropylene. Additional materials may be acceptable if proven not to contain PFAS.
  - All sampling equipment components and sample containers will not come in contact with aluminum foil, low density polyethylene (LDPE), glass, or polytetrafluoroethylene (PTFE, TeflonTM) materials including sample bottle cap liners with a PTFE layer. Standard two-step decontamination using detergent and clean water rinse will be performed for equipment that does come in contact with PFAS materials. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials will be avoided. Food and drink packaging materials and "plumbers thread seal tape," which contain PFAS, will be avoided during sampling. All clothing worn by sampling personnel will have been laundered multiple times. The sampler will wear nitrile gloves while filling and sealing the sample bottles.
  - Pre-cleaned sample bottles with closures, coolers, ice, sample labels and a chain of custody form will be provided by the laboratory, and the sampler will adhere to the following sampling protocol:
  - Fill glass jars with pre-cleaned 250 mL HDPE lids with the sample.

- Cap the bottles with the acceptable cap.
- Label the sample bottles.
- Fill out the chain of custody.
- Place in a cooler maintained at 4 ± 2º Celsius.
- One MS/MSD and one blind duplicate will be collected for every sample batch, not to exceed 20 samples, and at a frequency of one per day for equipment blanks. Category B electronic data deliverables will be requested from the laboratory.

The NYSDEC-issued Sampling, Analysis, and Assessment of PFAS guidance is included in Attachment B.

4.2 Reuse Sampling

Prior to reuse as backfill, excavated material will be evaluated using the criteria below:

- Concrete or demolition debris that does not exhibit signs of contamination will be sampled for asbestos prior to reuse on-site;
- Soil/fill material proposed for reuse will be sampled at a frequency and for the required parameters as outlined in NYSDEC's DER-10, Table 5.4, and/or the NYSDEC-issued Sampling, Analysis, and Assessment of PFAS, dated April 2023;
- Samples will be collected into laboratory-supplied containers;
- Samples will be kept in an ice-filled cooler or refrigerator, with the exception of any asbestos samples, until receipt by the laboratory (blue ice cannot be used when sampling for PFAS); and
- All sampling equipment will be decontaminated between sampling locations, as described in Sections 3.2 and 3.3 of this QAPP.

4.3 Endpoint Soil Sampling

In the event that evidence of contamination [e.g., odors, staining, elevated photoionization detector (PID) readings, or analytical results of soil samples above NYSDEC Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs)] is identified during any breach to the cover system or excavation of soil/fill as part of the redevelopment or renovation of the Site, endpoint soil sampling activities will be performed in accordance with NYSDEC DER-10. Per NYSDEC DER-10 Section 5.4, sidewall samples will be collected at a minimum of one sample for every 30 linear feet and bottom samples will be collected at a frequency of one sample for every 900 square feet. Endpoint soil samples will be analyzed for NYSDEC Final Commissioner's Policy (CP) Soil Cleanup Guidance (CP-51) volatile organic compounds (VOCs) by United States Environmental Protection Agency (EPA) Method 8260C, target compound list (TCL) semivolatile organic compounds/base-neutrals (SVOCs/BNs) by EPA Method 8270D, and PFAS by EPA Modified Method 537. Samples will be submitted to Pace Analytical Services of Westborough, MA, a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. Results will be validated by the third-party validator, who will prepare a DUSR.

Soil sampling will be conducted according to the following procedures:

- Characterize the sample according to the modified Burmister soil classification system;
- After selecting which samples will be analyzed in the laboratory, fill the required laboratory-supplied sample jars with soil from the selected sampling location. Seal and label the sample jars as described in Section 4.8 of this QAPP and place in an ice-filled cooler;

- Decontaminate any reusable soil sampling equipment between sample locations as described in Section 3.2 of this QAPP; and
- Record boring number, sample depth, and sample observations (e.g., evidence of contamination, PID readings, soil classification) in the field logbook and boring log data sheet, if applicable.

4.4 Groundwater Sampling

Post-remedial groundwater sampling will be conducted at the frequency specified in the SMP in accordance with the EPA low flow methodology. Groundwater sampling will be generally conducted as follows:

- Remove the well plug and immediately measure the vapor concentrations in the well headspace with a PID calibrated to the manufacturer's specifications;
- Measure the depth to water and total well depth, and check for the presence of non-aqueous phase liquid (NAPL) using an oil-water interface probe. Measure the thickness of NAPL, if any, and record the result in the field book and well log. If present, collect a sample of NAPL using a disposable plastic weighted bailer or similar collection device. Groundwater samples will not be collected from wells containing measurable NAPL;
- Connect dedicated tubing to either a submersible or bladder pump and lower the pump such that the intake of the pump is set at the midpoint of the water column within the screened interval of the well. In accordance with the NYSDEC-issued April 2023 Sampling, Analysis, and Assessment of PFAS, low-density polyethylene (LDPE) sampling bladders will be used when sampling for PFAS. Connect the discharge end of the tubing to the flow-through cell of a Horiba Quanta multi-parameter (or equivalent) meter. Connect tubing to the output of the cell and place the discharge end of the tubing in a five-gallon bucket;
- Activate the pump at the lowest flow rate setting of the pump;
- Measure the depth to water within the well. The pump flow rate may be increased such that the water level measurements do not change by more than 0.3 foot as compared to the initial static reading. The well-purging rate should be adjusted so as to produce a smooth, constant (laminar) flow rate and so as not to produce excessive turbulence in the well. The expected targeted purge rate will be approximately 0.5 liter and will be no greater than 3.8 liters per minute;
- Transfer discharged water from the 5-gallon buckets to 55-gallon drums designated for well-purge water;
- During purging, collect periodic samples and analyze for water quality indicators (e.g., turbidity, pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity) with measurements collected approximately every five minutes; and
- Continue purging the well until turbidity is less than 50 nephthalometric turbidity units (NTUs) and water quality indicators have stabilized to the extent practicable. The criteria for stabilization will be three successive readings for the following parameters and criteria:
    - Dissolved Oxygen - +/- 0.3 milligram per Liter (mg/L)
    - Turbidity - <50 NTUs
    - ORP/Eh - +/- 10 millivolts (mV)
    - Specific Conductance - +/- 3% millisievert per centimeter (mS/cm)

- PH - +/- 0.1 pH units

If the water quality parameters do not stabilize and/or turbidity is greater than 50 NTUs within two hours, purging may be discontinued. Efforts to stabilize the water quality for the well must be recorded in the field book, and samples may then be collected as described herein.

After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing and place them into the required sample containers. Label the containers as described in Section 4.8 of this QAPP and place them in an ice-filled cooler for shipment to the laboratory. Groundwater samples will be analyzed for VOCs by EPA Method 624.

Collect one final field sample and analyze for turbidity and water quality parameters (pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity).

Record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume), and observations in the project logbook and field data sheet, if applicable.

Once sampling is complete, remove the pump and tubing from the well. Dispose of the dedicated equipment and decontaminate reusable equipment, as described in Section 3.2. The purge water will be managed as described in Section 3.4 of this QAPP.

Sample collection for the emerging contaminants 1,4-dioxane and/or PFAS in groundwater is not planned. If required, samples will be collected and handled in accordance with the NYSDEC-issued Sampling, Analysis, and Assessment of PFAS, dated April 2023.

4.5 Sub-Slab Depressurization System Operation and Maintenance Sampling

Three SSDS vacuum monitoring points (VMPs) were installed during the Remedial Action implementation at strategic locations to inspect induced vacuum conditions during the operation of the SSDS. The VMP locations will be monitored at regular intervals as designated in the SMP.

4.5.1 SSDS Vacuum Monitoring

The procedures for instantaneously screening the MPs are as follows:

- Remove the access manhole cover;
- Attach the analog vacuum gauge or digital manometer with male quick-connect fitting to the female quick-connect fitting at the monitoring point well head and document reading;
- Detach vacuum gauge/manometer and confirm that quick-connect female fitting is closed; and
- Replace the access manhole.

4.5.2 Soil Vapor and Indoor Air Sampling

Sub-slab soil vapor and indoor air quality sampling will be conducted at the Site as part of the Soil Vapor Intrusion Evaluation (SVIE), as described in the RAWP and SMP. Sampling will be conducted in accordance with the New York State Department of Health (NYSDOH) Vapor Intrusion Guidance Document.

Indoor Air/Ambient Air Sample Collection

The indoor air sampling is to be conducted following the completion of a pre-sampling inspection and chemical inventory of the Site building, in accordance with the following details:

- Place a labeled 6-Liter SUMMA® canister at the breathing zone level (3 to 4 feet above ground surface) in sampling locations established by NYSDEC and NYSDOH;
- Record the vacuum reading from the vacuum gauge on the canister at the beginning of the eight-hour sampling period;
- Open the valve of the canister and record the time in the field book. At the end of the eight-hour sampling period, close the valves, remove the flow-rate controllers and vacuum gauges, install caps on the canisters, and record the time; and
- Place SUMMA canisters in shipping containers for transportation to the laboratory.

Repeat these procedures for all of the sampling locations.

Sub-Slab Soil Vapor Sample Collection

Each sub-slab soil vapor sample point will be purged using a Gilair Plus pump at a rate of about 0.2 liters per minute (L/min) to evacuate a minimum of three sample tubing volumes prior to sample collection. As a QA/QC measure, an inert tracer gas (i.e., helium) will be introduced into an above-grade sampling chamber to ensure that the sample points are properly sealed, thereby preventing subsurface infiltration of ambient air. Direct readings of helium of less than 10 percent in the sampling tube will be considered sufficient to verify a tight seal. Once a sufficiently tight seal is verified at each sample point, the purged soil vapor will be monitored for VOCs using a PID.

After purging, sub-slab soil vapor samples and co-located indoor air samples will be collected into laboratory-supplied, batch-certified, 6-liter SUMMA® canisters calibrated to collect the samples over eight hours. The canisters will be labeled and transported under standard chain-of-custody (CoC) protocol to the laboratory for analysis of VOCs by EPA Method TO-15.

4.6 Laboratory Methods

Table 1 summarizes the laboratory methods that will be used to analyze field samples, as well as the sample container type, preservation, and applicable holding times. Other analytes may be added if required by the disposal facility. Pace Analytical Services of Westborough, MA, a NYSDOH ELAP-certified laboratory will be used for all chemical analyses in accordance with DER-10 2.1(b) and 2.1(f), including the NYSDEC July 2005 Analytical Services Protocol (ASP) Category B Deliverables. Sample results will be reviewed by a third-party validator, who will prepare a DUSR.

Table 1
Laboratory Analytical Methods for Analysis Groups

Sample Type	Analysis	Method	Container Type	Preservative	Hold Time
Soil/Fill (Reuse/Backfill)	TCL VOCs	8260C	3 EnCore® or TerraCore® samplers and 2 oz. plastic jar	≤ 6 ºC	48 hours to extract, 14 days to analyze
	TCL SVOCs	8270D	8 oz. Glass Jar	≤ 6 ºC	14 days to extract, 40 days to analyze

Sample Type	Analysis	Method	Container Type	Preservative	Hold Time
	Total Analyte List (TAL) Metals and Hexavalent Chromium	6000/7000 Series, 6010C, and 7196A	8 oz. Glass Jar	≤ 6 ºC	6 months holding time; Mercury 28 days holding time; Hexavalent chromium 30 days to extract, 7 days to analyze
	Total Polychlorinated Biphenyls (PCBs)	8260C	3 EnCore® or TerraCore® samplers and 2 oz. plastic jar	≤ 6 ºC	48 hours to extract, 14 days to analyze
	Pesticides	8081B	4 oz. clear glass jar	4 ºC	5 days to extract, 49 days to analyze
	1,4-Dioxane	8270D plus Selective Ion Monitoring (SIM); 0.35 µg/L RL	1-liter amber jar	≤ 6 ºC	7 days to extract, 40 days to analyze
	PFAS	EPA Method 1633; 0.2 ng/L RL	3 x 250mL Polypropylene Bottles	≤ 6 ºC, Trizma	14 days to extract, 28 days to analyze
Soil/Fill (Endpoint Sampling)	CP-51 VOCs	8260	3 Encore samplers, 2 oz. plastic jar	4 ºC	48 hours
	TCL SVOCs/BNs	8270D	4 oz. clear glass jar	4 ºC	5 days to extract, 49 days to analyze
Groundwater Sampling	TCL VOCs	624	3 x 40 mL glass vials	HCL to pH < 2 and ≤ 6 ºC	14 days to analyze if preserved
Sub-Slab Soil Vapor/Indoor Air/Ambient Air Sampling	VOCs	TO-15	6-liter SUMMA® canister	None	30 days

Notes:
µg/L = micrograms per liter
ng/L = nanograms per liter
RL = Reporting Limit
HCL = Hydrochloric Acid

4.7 QA/QC Sampling

In addition to the laboratory analysis of the investigative soil and groundwater samples, additional analysis will be included for QA/QC measures, as required by the NYSDEC July 2005 ASP Category B sampling techniques. The QC samples will include field blanks, trip blanks, matrix spike/matrix spike duplicates (MS/MSD), and blind duplicate samples at a minimum frequency of one sample per 20 field samples collected or per sample delivery group (SDG). Table 2 provides a summary of the field samples and QA/QC samples to be analyzed by the laboratory.

Table 2
Field Sample and QC Sample Quantities

Sample Type	Parameters	Analytical Method[1]	Field Samples	QC Samples			
				Field Blank	Trip Blank[2]	MS/MSD[3]	Duplicate[3]
Soil	VOCs	EPA 8260C	TBD	1/20 (TBD)	1 (Laboratory-Supplied)	1/20 (TBD)	1/20 (TBD)
	SVOCs, TAL Metals, Mercury, PCBs, Pesticides, 1,4-Dioxane, and PFAS	EPA 8270D, 6010C/7471, 8082A, 081B, 8270D SIM, and Mod. 537	TBD	1/20	NA	1/20	1/20
Groundwater	VOCs	EPA 8260C	TBD	1/20 (TBD)	1 (Laboratory-Supplied)	1/20 (TBD)	1/20 (TBD)

Notes:
TBD = sampling to be determined based on work activities
NA = not applicable
[1] NYSDEC July 2005 ASP Category B deliverables
[2] One trip blank per shipment with VOC analyses
[3] One MS/MSD and duplicate sample per twenty field samples or sample shipment

4.8 Sample Handling

4.8.1 Sample Identification

All samples will be consistently identified in all field documentation, CoC documents, and laboratory reports. All samples will be amended with the collection date at the end of the sample name in a year, month, day (YYYYMMDD) format. Blind duplicate sample nomenclature will consist of the sample type, followed by an "X"; MS/MSD sample nomenclature will consist of the parent sample name only but triplicate sample volume will be collected and the CoC comment section will explain that the additional volume is for running the MS/MSD; and trip and field blanks will consist of "TB-" and "FB-", respectively, followed by a sequential number of the trip/field blanks collected within the SDG and the matrix (soil or groundwater). In accordance with NYSDEC Environmental Quality Information System (EQuIS™) protocol, special characters will not be used for sample nomenclature and sample IDs below 10 will be amended with a "0". Sample nomenclature examples are provided in Table 3.

Table 3
Examples of Sample Nomenclature

Sample Description	Sample Designation
Soil endpoint sample collected from 1 to 2 feet below grade at the north wall of an excavation	EP-N_1-2_ YYYYMMDD
Duplicate soil sample collected from 1 to 2 feet at the north wall of the excavation	EP-X_1-2_YYYYMMDD

Sample Description	Sample Designation
Import soil sample collected from the first imported stockpile	ISP-1_YYYYMMDD
Reuse soil sample collected from the first on-site stockpile	SP-1_YYYYMMDD
Groundwater sample collected from a monitoring well	MW-01_YYYYMMDD
Sub-slab soil vapor sample	SV-1_YYYMMDD
Ambient air sample	AA-1_YYYYMMD
Indoor air sample	IA-1_YYYYMMDD

4.8.2 Sample Labeling and Shipping

All sample containers will have labels containing the following information:

- Project identification;
- Sample identification;
- Date and time of collection;
- Analysis(es) to be performed;
- Sample preservative, if any; and
- Sampler's initials.

Once the samples are collected and labeled, they will be placed in chilled coolers and stored in a cool area away from direct sunlight to await shipment to the laboratory. All samples will be shipped to the laboratory at least twice per week. At the start and end of each workday, field personnel will add ice to the coolers as needed.

The samples will be prepared for shipment by placing each sample in a sealable plastic bag, then wrapping each container in bubble wrap to prevent breakage, adding freezer packs and/or fresh ice in sealable plastic bags, and including the CoC form. Tedlar® bags will be enclosed in a zip lock bag as an added protection prior to being placed in a cooler or shipment container without ice. SUMMA® canisters will also be placed into their appropriate shipment containers and do not require preservation with ice. All samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All coolers and shipment containers shipped to the laboratory will be sealed with mailing tape and a CoC seal to ensure that they remain sealed during delivery.

4.8.3 Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on CoC forms. The CoC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; signatures of individuals involved in sample transfer; and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

4.9 Field Instrumentation

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the Site for referencing proper operation, maintenance, and calibration procedures. The equipment will be calibrated according to the manufacturer's specifications at the start of each day of fieldwork, if applicable. If an instrument fails calibration, the project manager or QA/QC officer will be contacted immediately to obtain a replacement instrument. A calibration log will be maintained to record the date of each calibration, any failure to calibrate, and corrective actions taken. The PID will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas.

4.10 Data Review

In accordance with DER-10, each of the samples collected will undergo a third-party data review process to ensure the usability of the data collected. Data usability summary reports documenting any issues with QA/QC will be prepared and included in the Periodic Review Report (PRR). The resume for Lori Beyer of L.A.B. Validation Corp., the anticipated third-party data reviewer, is included in Attachment A.

4.11 Reporting of Data

All data generated during the monitoring activities will be submitted in the appropriate EQuIS™ Electronic Data Deliverable (EDD) format.

ATTACHMENT A
RESUMES OF KEY PROJECT PERSONNEL

MARC S. GODICK, LEP

SR. VICE PRESIDENT

Marc S. Godick, a Senior Vice President of the firm, has over 27 years of experience in the environmental consulting industry. Mr. Godick has broad-based environmental experience includes expertise in brownfield redevelopment, site assessment, remedial investigation, design and implementation of remedial measures, compliance assessment, and litigation support.

Education

M.E., Engineering Science/Environmental Engineering, Pennsylvania State University, 1998

B.S., Chemical Engineering, Carnegie Mellon University, 1989

Licenses/Certifications

Licensed Environmental Professional (License # 396) – State of Connecticut – 2003 - Present

40 Hour HAZWOPER and Annual Refresher Training, 1990 - Present

Supervisors of Hazardous Waste Operations (8 Hour), 1990

Professional Memberships

Chairman, Village of Larchmont/Town of Mamaroneck Coastal Zone Management Commission, 1997 – Present

Member, Westchester County Stormwater Advisory Board, 2011 – Present

Chairman/Member, Westchester County Soil and Water Conservation District, 2005 - 2010

Board of Directors, Sheldrake Environmental Center, Larchmont, New York, 2006 - 2008

Member, NYSDEC Risk-Based Corrective Action (RBCA) Advisory Group for Petroleum-Impacted Sites, 1997

Community Leadership Alliance, Pace University School of Law, 2001

Years of Experience

Year started in company: 2002

Year started in industry: 1990

RELEVANT EXPERIENCE

New York City Department of Design and Construction, East Side Coastal Resiliency, Manhattan, NY

Mr. Godick leads the environmental investigation and related support for a multidisciplinary design team selected by the New York City agency partnership of DDC, DPR, and ORR for the Feasibility Study and Pre-Scoping Services for East Side Coastal Resiliency (ESCR) project. The AKRF Team is providing design services, for 100+ year storm protection with anticipated sea level rise along the east side of Lower Manhattan. The ESCR subsurface exploration program involved a review of available utility plans and environmental reports involving manufactured gas plant (MGP) and potential petroleum-related contamination along a 2.5 mile study area from Montgomery Street to East 25th Street to develop a Subsurface Investigation Work Plan, which was approved by the NYCDEP.

The program included both public and private utility mark-out services across vast areas of the project site containing critical infrastructure to enable the installation of numerous shallow and deep borings and groundwater wells. Mr. Godick supervised the implementation of the investigation, which was completed in two phases. He was also responsible for the interpreting the wide-range of chemical parameters to evaluate critical cost and environmental impacts for the City and design team, and to prepare technical reports for submission and approval by the NYCDEP to satisfy for City Environmental Quality Review (CEQR) requirements. In addition, he continues to support the design and environmental review team, including preparation of the Hazardous Materials chapter for the Environmental Impact Statement, estimating cost impacts to the project for design and cost recovery purposes, and developing a Soil Management Plan. Mr. Godick also managed a hydrogeologic modeling study to evaluate potential hydraulic and contaminant migration impacts associated with construction of the proposed flood control structure. Mr. Godick continues to coordinate with the NYC team, NYSDEC, and Con Edison to ensure that the design incorporates appropriate remedial measures to be implemented prior to and/or in conjunction with construction.

Remedial Design, Gowanus Canal First Street Turning Basin, New York City Department of Design and Construction (DDC)

Mr. Godick is managing the remedial design for restoration of the filled-in former First Street Turning Basin in Brooklyn, New York. The remediation is being conducted as part of an Order of Consent between the City of New York and EPA for the Gowanus Canal Superfund Site. The remedial design will include removal of fill and sediment within the fill-in basing in an approximately 475-foot by 50-foot area. The restored basin will provide enhanced waterfront access to the community and a boat launch for canoes and kayaks. Design considerations include geotechnical concerns related to adjacent buildings and new and existing bulkheads; soil and water management; landscape design; and access/construction logistics. The design in anticipated to be completed in late 2017.

Remediation & Litigation Support, 3200 Jerome Avenue, Bronx, NY (Former PS 151)

Mr. Godick managed the investigation and remediation of a former public school in the Bronx under the New York State Department of Environmental Conservation (NYSDEC) Brownfields Cleanup Program (BCP). The site was contaminated with trichloroethylene (TCE) from historic operations at the property prior to use as a school. The remedial investigation included soil, groundwater, and vapor intrusion assessment both on-site and off-site. The remedial design included excavation of the source area, in-situ chemical oxidation of groundwater, and installation of a sub-slab depressurization system (SSDS) to address to potential vapor intrusion. Implementation of the remedy was complete in late 2014. The completed remediation allows for future multi-family residential, educational, childcare, and/or medical uses. Mr. Godick also provided litigation support in connection with a cost recovery claim against the former operator of the site.

Remediation & Litigation Support, Queens West Project, Avalon Bay Communities, Queens, NY

For over 20 years, AKRF has played a key role in advancing the Queens West development, which promises to transform an underused industrial waterfront property into one of largest and most vibrant mixed-use communities just across the East River from the United Nations. AKRF prepared an Environmental Impact Statement (EIS) that examines issues pertaining to air quality, land use and community character, economic impacts, historic and archaeological resources, and infrastructure. As part of this project, Mr. Godick managed one of the largest remediation projects completed under the NYSDEC BCP at the time that was contaminated by coal tar and petroleum. The remedy included the installation of a hydraulic barrier (sheet pile cut off wall), excavation of contaminated soil under a temporary structure to control odors during remediation, a vapor mitigation system below the buildings, and implementation of institution controls. The investigation, remediation design, and remedy implementation, and final sign-off (issuance of Certificate of Completion) were completed in two years. Total remediation costs were in excess of $13 million. Following completion of the remediation, Mr. Godick developed a cost allocation model and provided litigation support for a cost recovery action against a former operator of the site, including participation in a deposition as a fact witness prior to settlement between the parties.

On-Call Environmental Consulting Services (Various Locations), New York City Mayor's Office of Environmental Remediation (OER) (administered by NYCEDC)

Mr. Godick is managing an on-call contract with the OER for brownfields environmental assessment and remediation. The work has included conducting Phase I environmental site assessments (ESAs) and multi-media sampling of soil, groundwater, and soil vapor for various sites funded by EPA grants. The work plans and investigation reports were completed in accordance with OER and EPA requirements. AKRF also developed a remedial plan for a former gas station site in the Bronx and implemented a remedial plan for capping a park site in Staten Island. In addition, Mr. Godick is providing support to OER and an affordable housing developer to expedite an application for entry into the New York State Department of Environmental Conservation

(NYSDEC) Brownfield Cleanup Program (BCP), as well as preparation and implementation of the remedial investigation and remedial plan.

On-Call Environmental Consulting (Various Locations), New York City School Construction Authority

Mr. Godick is managing an on-call contract with the SCA for environmental assessment, remedial design, and plumbing disinfection. For new school sites, initial due diligence involves conducting Phase I environmental site assessments (ESAs) and multi-media sampling of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school and remediation requirements and associated costs. Once design for a school is underway, AKRF would prepare remediation plans and construction specifications and oversee the construction activities. For existing school sites, the work can involve conducting Phase I ESAs and indoor air quality testing, preparation of specifications, supervision of storage tank removals, investigation and remediation of spills, and development of remediation cost estimates. AKRF also oversees plumbing disinfection work, which is required prior to new plumbing being placed into service. The assignments involve reviewing and commenting on disinfection plans, supervision of the disinfection and confirmation testing, and preparation of a report documenting the work was conducted in accordance with the specifications and applicable requirements. Due to the sensitivity of school sites, work under this contract is often conducted on short notice and during non-school hours. Mr. Godick also manages AKRF's potable water sampling (for lead) work for SCA, including providing recommendations for mitigating exceedances.

Remediation, Former Industrial Laundry/Dry Cleaning Plant, 2350 Fifth Avenue. New York, NY

Mr. Godick managed the assessment, cleanup and post-remedial operations, maintenance and monitoring of the only NYSDEC listed inactive hazardous waste (State Superfund) site in Manhattan, a former laundry/dry cleaning plant in Harlem. Remedial investigation included evaluation of soil, groundwater, soil vapor, indoor air, and building materials. Interim remediation included the removal of contaminated building materials and operation of a sub-slab vapor extraction system retrofitted into the existing building. Mr. Godick coordinated with the regulatory agencies, site owner and occupants; and managed the investigation, remedial design, and remedial implementation activities. Phase 1 of the Remedial Action Work Plan consisted of further removal of contaminated building materials. Phase 2 of the remediation included a sub-slab depressurization system (SSDS) retrofitted into the existing building, soil vapor extraction (SVE) system, and chemical oxidation injection. Remedial action work was completed in 2014 and documented in a Final Engineering Report. NYSDEC issued Certificate of Completion in January 2015 and the site has been reclassified to a "Class 4" site (site properly closed – requires continued management). Mr. Godick continues to manage the project, including operations, maintenance and monitoring of the SSDS and SVE system under the NYSDEC-approved Site Management Plan.

606 West 57th Street, New York, NY, TF Cornerstone

AKRF has been retained by TF Cornerstone to provide environmental services for the proposed redevelopment of a portion of the block bounded by Eleventh and Twelfth Avenues and West 56th and 57th Streets. The proposed actions included a zoning map amendment, zoning text amendments, a special permit, and an authorization to facilitate development of approximately 1.2 million square feet of residential and retail space. AKRF prepared an Environmental Impact Statement (EIS) for the New York City Department of City Planning (DCP) to analyze the effects of the proposed actions and development of the proposed building. The EIS addressed the full range of environmental impacts associated with the proposed development.

Mr. Godick was responsible for the elements of the EIS pertaining to hazardous materials, including coordination of a Phase I ESA and summarizing pertinent site information for the hazardous materials and construction chapters. Mr. Godick provided pre-acquisition support to TF Cornerstone, which included development of a remedial cost estimate report to outline remediation cost during site development. Mr. Godick also managed work related to the subsurface investigation, localized remediation (chemical injection and limited excavation beneath the building basement) and regulatory closure of a petroleum spill on a portion of the project site to satisfy NYSDEC requirements. After EIS certification, Mr. Godick coordinated approvals with NYCOER, the regulatory agency overseeing remedial measures related to the redevelopment of the site. The Site has an (E) Designation and is participating in the New York City Voluntary Cleanup Program. Mr. Godick managed the preparation of a Phase II Investigation Work Plan, Remedial Investigation Report, Remedial Action Work Plan (RAWP), and contractor specifications for soil management and tank and hydraulic lift removal. Mr. Godick managed implementation of the remediation in accordance with the RAWP.

164 Kent Avenue, Brooklyn, NY (AKA Northside Piers and 1 North 4th Place), RD Management, L&M Development, Toll Brothers, and Douglaston Development

The project was a multi-phase development consisting of a large waterfront block in the Williamsburg Rezoning Area. The project site has been developed with a mixed-use residential-commercial high rise towers with an esplanade and a pier along the East River. AKRF provided acquisition and development support, including performing Phase I and II environmental site assessments and development of remedial cost estimates for development, and preparation of Remedial Action Plans (RAPs) and Construction Health and Safety Plan (CHASPs) for approval by DEP and OER. AKRF provided assistance with construction oversight during soil handling activities and managing the Community Air Monitoring Plan (CAMP) activities. Closure reports were prepared and the project is fully built-out and occupied.

Site Investigation–Over 20 Facilities, Con Edison, New York, NY

Mr. Godick managed site investigations associated with petroleum, dielectric fluid, and PCB releases at over 20 Con Edison facilities including service centers, substations, generating stations, and underground transmission and distribution systems. Site investigations have included due diligence site reviews, soil boring installation, monitoring well installation, hydrogeologic testing, and water quality sampling. Risk-based closures were proposed for several sites.

Underground Storage Tank Closure and Site Remediation–Program Management, Con Edison, New York, NY

Mr. Godick provided technical assistance to Con Edison in developing technical submittals and budgets associated with tank closures at over 50 facilities. Technical summaries were prepared for submittal of contractor-prepared closure reports to the NYSDEC. The summaries included a review of historic pre-closure assessments, tank closure data, and provided recommendations for additional assessment, remediation or closure. Subsequently, a three-year program budget was developed for implementation of the UST investigation/remedial program, which Con Edison utilized for internal budgeting purposes.

Site Investigation–7 World Trade Center Substation, Con Edison, New York, NY

Mr. Godick managed the site investigation at the former 7 World Trade Center Substation in an effort to delineate and recover approximately 140,000 gallons of transformer and feeder oil following the collapse of the building. The project involved coordination with several crews, Con Edison, and other site personnel.

Site Investigation–Former Manufactured Gas Plant (MGP) Facilities, Con Edison, New York, NY

Mr. Godick managed site investigations at four former manufactured gas plant (MGP) facilities. The investigations were completed at Con Edison substations, a flush pit facility, and a service center to support remedial design and expansion at select locations. The findings from these characterizations were used by Con Edison to make appropriate changes to the design specifications and to plan for appropriate handling of impacted materials and health and safety protocols during future construction activities.

National Grid – Halesite Manufactured Gas Plant Site Remediation, Town of Huntington, NY

Mr. Godick managed the remedial design and engineering work associated with remediation of National Grid's former MGP located in the Town of Huntington. The site is situated in a sensitive location along the waterfront, surrounded by commercial and residential properties, and half the property where the remediation was conducted was a steep slope. The remedy consisted of soil removal, oxygen injection, and non-aqueous phase liquid recovery. Mr. Godick was responsible for the development of the remedial work plans, design/construction documents, landscape architecture, confirmatory sampling, air monitoring, supervision, and preparation of close-out documentation in accordance with NYSDEC requirements.

Verizon, Investigation & Remediation, Various Locations, NY, PA and DE

Mr. Godick managed over 50 environmental investigations and remediation projects related to petroleum releases at various facilities. Responsibilities included annual budgeting, day-to-day project management, development and implementation of soil and ground water investigation workplans, ground water modeling, risk evaluation, remedial action work plans, remedial design, system installation, waste disposal, well abandonment, and operation and maintenance. Many of the assessment and remedial projects followed a risk-based approach. Remedial technologies implemented included air sparging, soil vapor extraction, bioremediation, pump and treat, soil excavation, and natural attenuation.

Storage Tank Management, Verizon, Various Locations, NY, PA, DE, and MA

Mr. Godick managed the removal and replacement of underground and aboveground storage tank systems for Verizon in New York, Pennsylvania, Delaware, and Massachusetts. Responsibilities included the management of design, preparation of specifications, contractor bidding, construction oversight, project budget, and documentation. For selected AST sites, managed the development of Spill Control, Contingency and Countermeasures (SPCC) plans.

Litigation Support, Cost Recovery Action, Gowanus Superfund Site, New York

Mr. Godick provided technical support to one of the 40+ potential responsible parties (PRPs) associated with a Federal Superfund site in New York State, which included conducting a liability assessment for the various parties and development of a cost allocation model.

Litigation Support, Cost Recovery Action, New York State Superfund Site

Mr. Godick provided technical support for the former owner of a New York State Superfund site in upstate New York. The owner of the property brought a cost recovery action against our client as a PRP. Mr. Godick completed a technical review of the draft Remedial Investigation/Feasibility Study prepared by the opposing party's consultant to develop a more cost effective remedial strategy and to better position the client for liability allocation as part of future settlement negotiations. Mr. Godick also developed a cost allocation report that included a model for settlement negotiations, as well as participated in mediation.

Litigation Support & Remediation, Former Service Station, Brooklyn, New York

Mr. Godick took over management of remediation of an inactive service station (formerly conducted by another firm). His approach outlined additional characterization and remediation efforts which resulted in successful closure of the spill by NYSDEC within two years. Mr. Godick testified as an expert witness at a hearing in the New York State Supreme Court of Kings County to determine the adequacy of the remediation efforts.

Litigation Support, Cost Recovery Action, Town of Carmel, New York

Mr. Godick served as an expert witness representing the owner of a property in a landlord-tenant dispute, which was used as a gasoline station and oil change facility. Mr. Godick prepared exhibits, testified, and participated in meetings with NYSDEC to support the landlord's claim that the oil change tenant's practices were poor and were adversely affecting the environment and the overall facility systems at the site.

Litigation Support, Cost Recovery Action, New York State Petroleum Spill Site, New York, NY

Mr. Godick provided technical support for the former owner of a New York City multi-unit residential apartment building. The State of New York brought a cost recovery action against our client as a result of a previous spill from a former underground storage tank. Mr. Godick reviewed invoices and project documentation to dispute work performed by the NYSDEC, which provided the basis for settlement at a fraction of the initial claim.

Litigation Support, Class Action Lawsuit, Confidential Client, NJ

Mr. Godick provided technical support for a class action suit involving a petroleum-impacted community water supply in southern New Jersey. The technical assistance included analysis of expert testimony and coordination with legal counsel in preparing for cross-examination of the opposing party's lead expert witness.

Cost Analysis, Environmental Insurance Claims, Various Locations

Mr. Godick provided technical support for cost analyses completed for a large national insurance company related to several former MGP and other industrial sites. Responsibilities included evaluation and development of cost-effective remedial strategies, as well as compilation of detailed costs for remedial action implementation and closure.

REBECCA KINAL, P.E.

VICE PRESIDENT

Rebecca Kinal has over 20 years of experience in the assessment and remediation of soil and groundwater contamination and other hazardous/non-hazardous waste problems. Ms. Kinal's experience includes environmental due diligence, soil and groundwater investigations, leaking underground storage tank studies, soil gas/vapor intrusion surveys, and oversight of small- and large-scale remediation programs, including design of groundwater remediation systems and vapor mitigation systems. She has directed numerous Phase I and Phase II investigations and remediation programs, many of them in conjunction with commercial/residential developers, law firms, lending institutions, and public agencies. She is experienced in the cleanup of contaminated properties under New York State Brownfield Cleanup Program (BCP) regulations and the New York City "E-designation" program. As a part of this work, her duties have included technical and report review, proposal writing, scheduling, budgeting, and acting as liaison between clients and regulatory agencies, and project coordination with federal, state, and local authorities.

BACKGROUND

Education

M.S., Hydrogeology, Rensselaer Polytechnic Institute, 1995

B.S., Civil Engineering, Lafayette College, 1992

Licenses/Certifications

State of New York, P.E. Registration No. 082046, 2004

Years of Experience

Year started in company: 2000

Year started in industry: 1996

RELEVANT EXPERIENCE

White Plains Mall/Hamilton Green

Ms. Kinal managed environmental due diligence and remediation planning for the project, which included Phase I and II environmental assessments, a petroleum Spill investigation, preparation of remediation cost estimates, and application to the NYSDEC BCP.

New York City School Construction Authority On-Call Contracts for Environmental Consulting Services, Various Sites, NY

Ms. Kinal serves as the project manager for AKRF's on-call hazardous materials consulting contract with the New York City School Construction Authority for over 8 years. For potential new school sites, assignments include initial due diligence, Phase I environmental site assessments, (ESAs) and subsurface investigation of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school, likely remediation requirements, and associated costs. For sites undergoing design and development, assignments include preparation of remediation plan, contract specifications, and design drawings. The work has also included conducting indoor air quality testing, vapor intrusion assessments, preparation of specifications, supervision of storage tank removals, and investigation and remediation of spills for existing schools. Due to the sensitivity of school sites, work under this contract is often conducted on short notice and during non-school hours.

USTA National Tennis Center, Queens, NY

AKRF prepared an EIS for the New York City Departments of City Planning (DCP) and Environmental Protection (DEP) as co-lead agencies to analyze the expansion of the National Tennis Center, which includes multiple improvements and construction projects at the USTA campus over several years. As part of the EIS requirements, AKRF prepared a Remedial Action Plan for implementation during the proposed project's construction. In accordance with the RAP, vapor mitigation systems were incorporated into the design for several of the proposed structures at the facility, including two new stadiums, a new transportation center, and several practice court facilities. Ms. Kinal prepared the specifications and design drawings for the vapor mitigation and is providing on-going construction support to review contractor submittals and inspect the vapor barrier and sub-slab depressurization system installations.

Montefiore Medical Center, Various Locations, NY

Ms. Kinal provides due diligence assistance to Montefiore Medical Center (MMC) for the ongoing expansion of their facilities, primarily in the Bronx and Westchester County. She conducts and manages environmental due diligence tasks related to their property transactions, including Phase I Environmental Site Assessments (ESAs), Phase II investigations, and geophysical surveys. She also assists MMC in making decisions with respect to environmental risk issues.

Queens West Development Project, Long Island City, NY

For over 20 years, AKRF has played a key role in advancing the Queens West development, which promises to transform an underused industrial waterfront property into one of largest and most vibrant mixed-use communities just across the East River from the United Nations. AKRF has prepared an Environmental Impact Statement that examines issues pertaining to air quality, land use and community character, economic impacts, historic and archaeological resources, and infrastructure. As part of the project, AKRF also undertook the largest remediation ventures completed to date under the NYSDEC Brownfields Cleanup Program (BCP). Ms. Kinal helped prepare the Remedial Work Plan (RWP) and oversaw the remediation of Parcel 9, a 1.8-acre former industrial site. Remediation includes installation of a sheet pile containment wall, excavation of coal tar- and petroleum-contaminated soil under a temporary structure to control odors during remediation, vapor mitigation for the future buildings, and institutional controls. Upon completion of the remediation activities, Ms. Kinal managed the preparation of a Final Engineering Report (FER) to document the clean-up activities. The NYSDEC issued a Certificate of Completion (COC) for the Parcel 9 site in December 2006. Ms. Kinal continues to oversee post-remediation monitoring and site management activities to ensure that the remedy remains in-place and effective.

Roosevelt Union Free School District, Roosevelt, NY

Ms. Kinal managed environmental investigation and remediation activities for the sites of three new elementary schools and a new middle school in Roosevelt, New York. Remediation activities include removal/closure of contaminated dry wells and underground petroleum storage tanks, and excavation and off-site disposal of petroleum- and pesticide-contaminated soil. Remediation of the new middle school site, which also included a sub-slab depressurization system, was conducted through coordination with the NYSDEC, NYSDOH, New York State Education Department (NYSED), and the local school district. Upon completion of the remediation and school construction, Ms. Kinal managed confirmatory indoor air testing and preparation of a Final Engineering Report to document the site clean-up. The NYSDEC issued a Certificate of Completion and the school was open for the Fall 2008 semester as planned.

Proposed NYC Public School Campus, Bronx, NY

Ms. Kinal provided environmental consulting services to the selected environmental remediation contractor for this former manufactured gas plant in the Mott Haven neighborhood of the Bronx, which was remediated under the NYSDEC BCP. These services included: preparation of an in situ sampling plan and excavation plan for waste characterization and disposal; supervision of waste characterization sampling activities; development and implementation of a community air monitoring program during all remediation activities; and daily reporting to the NYC School Construction Authority.

National Grid – Halesite Manufactured Gas Plant Site, Town of Huntington, NY

Ms. Kinal served as the project manager for the remedial design and engineering work associated with remediation of National Grid's former manufactured gas plant (MGP) located in the Town of Huntington. The site is situated in a sensitive location along the waterfront, surround by commercial and residential properties, and half the property where the remediation was conducted is a steep slope. The remedy consisted of soil removal, oxygen injection, and non-aqueous phase liquid recovery. Ms. Kinal developed the remedial work plans, design/construction documents, and managed environmental oversight of the remedial work, including waste characterization and tracking, confirmatory endpoint sampling, air monitoring, and reporting to the NYSDEC. After the remediation work was completed, Ms. Kinal prepared appropriate close-out documentation in accordance with NYSDEC requirements.

Shell Service Station, Millwood, NY

Ms. Kinal planned and oversaw a Phase I Environmental Site Assessment and Phase II Subsurface Investigation of this active gasoline station in northern Westchester County. The Phase I/Phase II investigations were performed for the potential buyer of the property who wished to redevelop it with a more modern service station and convenience store. Ms. Kinal also prepared a conceptual remediation plan to address several areas of petroleum contamination identified during the Phase II. The plan, which was approved by NYSDEC, will be implemented in conjunction with the site redevelopment activities to achieve closure for several spills reported at the site.

Pelham Plaza Shopping Center Site Investigation & Remediation, Pelham Manor, NY

Ms. Kinal managed a Site Investigation at Pelham Plaza, an approximately ten-acre site that formerly contained a manufactured gas plant. The site was investigated under a voluntary clean-up agreement entered into with the NYSDEC by the site owner. The site investigation included advancing over 100 soil borings with continuous soil sampling to bedrock, installing monitoring and recovery wells, and conducting test pitting both indoor and outdoor locations to collect soil and groundwater samples and determine the extent of Non-Aqueous Phase Liquid (NAPL). The investigation also included: soil gas sampling to determine contaminant concentrations in the vapors beneath the foundation of an on-site retail store; sediment sampling in an adjacent creek to identify off-site impacts; and a tidal survey to determine tidal influence on groundwater levels at the site. Ms. Kinal also oversaw interim remedial measures, which include biweekly pumping of recovery wells to remove dense NAPL (DNAPL) from the site subsurface.

Shaws Supermarket Redevelopment Project, New Fairfield, CT

Ms. Kinal managed the Remedial Investigation (RI) for an approximately nine-acre shopping center site that was contaminated by releases from former dry cleaning operations. The site was being redeveloped with a new supermarket and separate retail stores. The investigation included the installation of monitoring wells in the intermediate overburden aquifer and bedrock aquifer, sampling of existing and newly installed wells, geophysical logging in bedrock wells, and pump testing in intermediate and bedrock wells. Ms. Kinal prepared a Remedial Action Work Plan (RAWP) based on results from the RI, which included a groundwater pump and treat system to contain a plume of perchlorethylene (PCE)-contaminated groundwater, and excavation and disposal of contaminated soil in the presumed source area. Following CTDEP approval of the RAWP, Ms. Kinal prepared bid specifications for soil excavation and remediation system installation, and oversaw their implementation. Ms. Kinal also prepared NPDES permit applications for discharges from construction dewatering and the groundwater remediation system, and conducted associated discharge monitoring.

Yankee Stadium, Bronx, NY

Ms. Kinal performed the hazardous materials analysis for the Draft Environmental Impact Statement for the proposed new Yankee Stadium. The analysis included a Phase I Environmental Site Assessment of the entire project area and Subsurface (Phase II) Investigation in areas where environmental conditions were identified. The Phase II investigation included geophysical surveys to search for potential underground storage tanks; and soil, soil gas, and groundwater sampling at over 40 locations to determine potential environmental impacts during and after the proposed construction. Ms. Kinal also developed an extensive community air monitoring plan and oversaw its implementation during deconstruction of the old Yankee Stadium.

Avalon on the Sound, New Rochelle, NY

Ms. Kinal oversaw environmental investigation and soil remediation during the construction of two luxury high-rise apartment buildings and an associated parking garage. Investigation activities included an electromagnetic survey to search for possible underground storage tanks, and subsurface sampling to characterize soil and groundwater. Remediation activities included removing underground storage tanks, excavating and disposing of soil contaminated with volatile and semi-volatile organic compounds, and collecting end-of-excavation confirmation samples.

Davids Island Environmental Audit, New Rochelle, NY

Ms. Kinal managed the hazardous materials portion of the audit of this undeveloped island site, including a Phase I Environmental Site Assessment (ESA) and Subsurface (Phase II) Investigation in areas where environmental conditions were identified. The Phase II investigation included collecting soil samples from more than 100 locations and analyzing them for targeted compounds, including volatile organic compounds, semi-volatile compounds, metals, pesticides, and polychlorinated biphenyls (PCBs). Ms. Kinal also oversaw an electromagnetic (EM) survey conducted to identify the location of suspected underground storage tanks on the island. Based on soil sample results, Ms. Kinal estimated the volume of contaminated soil requiring remediation and prepared cost estimates for soil excavation and for transportation and disposal of contaminated soil and hazardous materials.

Outlet City Site Investigation, Queens, NY

Ms. Kinal prepared a work plan for remedial investigation of the Outlet City site, a property in Long Island City that was formerly occupied by a manufacturer of industrial cleaners and pharmaceuticals. The site is being investigated and remediated under the NYSDEC voluntary clean-up program. In preparing the work plan, Ms. Kinal evaluated results from several previous investigations and conducted a limited groundwater sampling program to determine future data needs for designing remediation of creosote-contaminated soil and groundwater. The work plan included additional soil and groundwater sampling, a tidal survey to determine tidal influence on groundwater levels, and pilot free product recovery testing. Ms. Kinal also helped design a venting system for an on-site basement and performed exposure calculations for the vented vapors.

Yonkers Waterfront Redevelopment Project, Yonkers, NY

For this redevelopment along Yonkers' Hudson River waterfront, Ms. Kinal supervised the remediation of Parcels H and I that were contaminated with hazardous soil. During the remediation process, she reviewed the subcontractor health and safety plans, delineated the areas of excavation, and oversaw field activities to ensure compliance with the specifications and appropriate regulations. This property was remediated under the NYSDEC Environmental Restoration Program (ERP).

J. PATRICK DIGGINS, P.G.

Technical Director

Patrick Diggins has 11 years of environmental consulting experience in site investigation and remediation practice. His experience includes implementing Phase I Environmental Site Assessments, Subsurface (Phase II) Investigations, and Remedial Investigations; and developing and managing remedial action programs including soil excavation, remediation system design and installation, regulatory reporting, and post-remedial site management. Several of his New York City (NYC) projects have been successfully investigated and/or remediated under either the New York State Department of Environmental Conservation (NYSDEC) Brownfield, or NYC Office of Environmental Remediation (OER) (E) Designation or Voluntary Cleanup Programs (VCP). Prior to his work in New York City, he gained experience in the New England region implementing large-scale environmental investigation and groundwater remediation projects.

BACKGROUND

Education

M.S. Hydrogeology, University of Massachusetts - Amherst, 2009
B.S Geology, Beloit College, 2005

Certifications

New York State Certified Professional Geologist, NY – License No. 000288
OSHA 40 Hour HAZWOPER
OSHA 8 Hour Refresher

Professional Memberships

Member, American Institute for Professional Geologists (AIPG), 2018 – Present
Member, New York State Council of Professional Geologists (NYSCPG), 2016 – Present

Years of Experience

Year started at AKRF: 2016
Year started in the Industry: 2008

RELEVANT EXPERIENCE

Former Budweiser Facility, Long Island City, New York

AKRF was initially tasked with completion of Phase I Environmental Site Assessment (ESA), and implementation of a Subsurface (Phase II) Investigation and Groundwater Elevation Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the Phase I ESA site reconnaissance and the subsurface investigation, as well as completing reports for delivery to the client. AKRF is now assisting the client with navigating City and State environmental regulators in preparation for remediation during redevelopment.

DOT Relocation Site, Long Island City, New York

AKRF was initially tasked with completion of Phase I ESA and implementation of a Subsurface (Phase II) Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the Phase I ESA site reconnaissance and the subsurface investigation, as well as completing reports for delivery to the client. AKRF has now assisted the client with entering the proposed site redevelopment project into the New York State Brownfield Cleanup Program (BCP), completed a Remedial Investigation, and is preparing a Remedial Action Work Plan (RAWP). Mr. Diggins will work with NYSDEC and the property owner to obtain approval for and then implement the RAWP.

Queens Animal Shelter, Ridgewood, Queens, New York

AKRF was initially tasked with implementation of a Subsurface (Phase II) Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the subsurface investigation, as well as completing reports for delivery to the client. AKRF has now assisted the client with entering the proposed site redevelopment project into the New York State BCP. The RAWP is complete and remediation and redevelopment began in December 2019. Mr. Diggins has managed implementation of the remedy, which is ongoing at the Site.

272 4th Avenue, Brooklyn

AKRF was tasked with completion of Phase I ESA and implementation of a Subsurface (Phase II) Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the Phase I ESA site reconnaissance and the subsurface investigation, as well as completing reports for delivery to the client. Based on the results of the investigation, AKRF assisted the client with entering the proposed site redevelopment project into the New York State BCP, and submitted a Remedial Investigation Work Plan (RIWP), which was recently approved by NYSDEC.

1325 Jerome Avenue, Bronx, NY

The property is a New York City Mayor's Office of Environmental Remediation (NYC OER) (E) Designation site. AKRF performed the Remedial Investigation; prepared and received approval for the RAWP by the NYC OER and the NYSDEC Spills Project Manager, and is overseeing the successful implementation of remedial actions during redevelopment, which are ongoing. For this project, Mr. Diggins acted as project manager, overseeing field personnel, reviewing daily reports, coordinating with property owner, and regulators.

110-10 Astoria Boulevard (419Q), Queens, NY

The property is a future public school, and is enrolled in NYC OER (E) Designation program. AKRF is representing the New York City School Construction Authority (NYC SCA) and has performed the remedial investigation; developed remedial work plans for approval by the NYC OER, and is currently overseeing the implementation of remedial actions. For this project, Mr. Diggins is acting as project manager, overseeing field personnel and reviewing daily reports.

2581 Adam Clayton Powell Jr. Blvd (M010), New York, NY

The property is a Metropolitan Transit Authority (MTA) station with a NYC public school (Frederick Douglass Academy) constructed on a platform above. A petroleum spill was identified in the train station that appeared to have originated from within the school. AKRF represented NYC SCA and worked with MTA to investigate and remediate the spill.

11 Greene Street, New York, NY

The property is a NYC OER Voluntary Cleanup Program (VCP) site. AKRF performed the remedial investigation; developed remedial work plans for approval by the NYC OER, and oversaw the successful implementation of remedial actions during redevelopment. For this project, Mr. Diggins acted as project manager, overseeing field personnel, reviewing daily reports, coordinating with property owner and NYC OER. The remedial actions are complete and the building is expected to open in 2020.

East Side Coastal Resiliency, East River Waterfront/Lower Manhattan, New York

Mr. Diggins prepared cost estimates for construction of coastal resiliency structures in potentially contaminated areas of the East River waterfront, on behalf of NYC Department of Design and Construction (DDC). He evaluated field and laboratory data to assist the project manager in the report preparation, and represented AKRF at meetings with city officials.

29-39 East Fordham Road, Bronx, NY

The property has undergone remediation of a petroleum spill that originated in the facility basement. AKRF performed the spill investigation, developed remedial work plans for approval by the NYSDEC, and oversaw the implementation of remedial actions. For this project, Mr. Diggins acted as project manager overseeing field personnel and guiding the client over the regulatory hurdles.

MICHAEL BATES

GEOLOGIST – SITE ASSESSMENT AND REMEDIATION

Michael Bates is a Geologist/Environmental Professional II in AKRF's Site Assessment and Remediation group, with experience in environmental sampling and monitoring during site remediation, subsurface and vapor intrusion investigations, remediation system operation and maintenance, and technical reporting.

BACKGROUND

Role in Project
Junior Environmental Scientist

EDUCATION

B.A. Geology, SUNY Geneseo, May 2017

CERTIFICATIONS

OSHA 40-hour Hazardous Waste Operations and Emergency Response Training
OSHA 30-hour Construction Safety Training
EPA Lead Risk Assessor
NY Certified Asbestos Inspector

YEARS OF EXPERIENCE

2 years in the industry

6 months with AKRF

RELEVANT EXPERIENCE

New York City School Construction Authority On-Call Contracts for Environmental Consulting Services, Various Sites, NY

AKRF has undertaken various assignments under five consecutive hazardous materials on-call contracts, including environmental assessment, remedial design, construction support, plumbing disinfection, and potable water (lead) sampling consulting tasks. For potential new school sites, assignments include initial due diligence, Phase I environmental site assessments, and subsurface investigation of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school, likely remediation requirements, and associated costs. For sites undergoing design and development, assignments include preparation of remediation plans, design of sub-slab depressurization systems and contract specifications, and construction oversight. The work also includes conducting indoor air quality testing, vapor intrusion assessments, preparation of specifications and construction management for petroleum storage tank removals, and investigation and remediation of spills for existing schools. Under the most recent contract, Michael Bates has completed waste characterization sampling for planned improvements at an existing school facility (K597) and conducted environmental oversight and community air monitoring during construction of a new school facility (X468).

Phipps Houses, Atlantic Chestnut, Brooklyn, NY

AKRF was retained to provide environmental consulting services in connection with the purchase and redevelopment of former burned manufacturing buildings encompassing an entire city block in Brooklyn, New York. AKRF conducted due diligence prior to acquisition, and facilitated entry into the New York State Brownfield Cleanup Program (NYSBCP) to delineate contamination in soil, groundwater, and soil vapor; and remediate the lots during redevelopment. AKRF designed and implemented several rounds of investigations and remedies. The first phase of the project received NYSDEC sign off in 2022 and the second phase of the project is currently being remediated and redeveloped. The remedies include groundwater injections and treatment, fuel oil recovery and tank closure, management of soil disposal, excavation and disposal of hazardous and non-hazardous waste streams, installation and operation of soil vapor extraction systems and sub-slab depressurization systems, and long-term groundwater and vapor monitoring and reporting to ensure compliance with the NYSBCP. Michael Bates served as an on-site environmental during the complex beginning stages of the second phase of remediation, and completed hazardous waste delineation sampling.

Newtown Creek Bud Site - North Block, Queens, NY

AKRF is providing environmental planning and site assessment/remediation services for a 575-unit, 34-story apartment building at 55-01 Second Street and an 812-unit, 39-story building at 2-10 54th Avenue in Long Island City. The buildings will total 1.43 million square feet. The site was investigated and is being remediated under the NYS Brownfield Cleanup Program. Michael Bates served as an on-site environmental monitor during construction to ensure compliance with the Remedial Action Work Plan. His duties included community and work zone air monitoring, soil disposal and import tracking, inspection of the sub-slab depressurization system installation, and associated reporting.

1100 Myrtle Avenue, Brooklyn, NY

AKRF prepared a Remedial Investigation Work Plan (RIWP) for New York City Mayor's Office of Environmental Remediation (OER) and performed the associated Remedial Investigation. Following, the site was accepted into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), after which AKRF conducted additional investigation and prepared a Remedial Action Work Plan (RAWP). Michael Bates conducted inspections during start-up of the sub-slab depressurization system and soil vapor extraction system, which were installed under the new building in accordance with the RAWP and associated design documents.

221 Glenmore Avenue, Brooklyn, New York

AKRF is conducting a large-scale Remedial Investigation at a former lighting company facility in support of a NYSDEC Brownfield Cleanup Program application and anticipated remediation. Michael Bates performed groundwater sampling of newly installed and existing monitoring wells at the Site in accordance with EPA low-flow sampling protocols and preformed soil vapor sampling from nested vapor points to determine the vertical distribution of chlorinated solvent contamination in the subsurface.

BESS, Astoria, Queens, New York

AKRF prepared and is implementing a Construction Health and Safety Plan (CHASP, approved by the New York Power Authority) during construction of a stand-alone new battery energy storage system at a Con Edison facility in Astoria Queens. Michael Bates served as an on-site environmental monitor during construction to ensure compliance with the CHASP. His duties included community and work zone air monitoring during utility clearance and waste characterization sampling.

PREVIOUS EXPERIENCE

As a Staff Geologist at two previous environmental consulting firms, Michael Bates conducted subsurface investigations, low-flow groundwater sampling, and soil vapor sampling, and prepared associated technical reports. He also conducted routine O&M and monitoring of large groundwater and soil vapor treatment systems and sub-slab depressurization systems, and oversaw installation/rehabilitation of recovery wells for system upgrades.

Lori A. Beyer

SUMMARY:

General Manager/Laboratory Director with a solid technical background combined with Management experience in environmental testing industry. Outstanding organizational, leadership, communication and technical skills. Customer focused, quality oriented professional with consistently high marks in customer/employee satisfaction.

EXPERIENCE:

1998-Present L.A.B. Validation Corporation, 14 West Point Drive, East Northport, NY
President

- Perform Data Validation activities relating to laboratory generated Organic and Inorganic Environmental Data.

1998-Present American Analytical Laboratories, LLC. 56 Toledo Street, Farmingdale, NY
Laboratory Director/Technical Director

- Plan, direct and control the operation, development and implementation of programs for the entire laboratory in order to meet AAL's financial and operational performance standards.
- Ensures that all operations are in compliance with AAL's QA manual and other appropriate regulatory requirements.
- Actively maintains a safe and healthy working environmental that is demanded by local laws/regulations.
- Monitors and manages group's performance with respect to data quality, on time delivery, safety, analyst development/goal achievement and any other key performance indices.
- Reviews work for accuracy and completeness prior to release of results to customers.

1996-1998 Nytest Environmental, Inc. (NEI) Port Washington, New York
General Manager

- Responsible for controlling the operation of an 18,000 square foot facility to meet NEI's financial and operational performance standards.
- Management of 65 FTEs including Sales and Operations
- Ensure that all operations are in compliance with NEI's QA procedures
- Ensures that productivity indicators, staffing levels and other cost factors are held within established guidelines
- Maintains a quantified model of laboratory's capacity and uses this model as the basis for controlling the flow of work into and through the lab so as to ensure that customer requirements and lab's revenue and contribution targets are achieved.

1994-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York
Technical Project Manager

- Responsible for the coordination and implementation of environmental testing programs requirements between NEI and their customers
- Supervise Customer Service Department
- Assist in the development of major proposals
- Complete management of all Federal and State Contracts and assigned commercial contracts
- Provide technical assistance to the customer, including data validation and interpretation
- Review and implement Project specific QAPP's.

1995-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York
Corporate QA/QC Officer

- Responsible for the implementation of QA practices as required in the NJDEP and EPA Contracts
- Primary contact for NJDEP QA/QC issues including SOP preparation, review and approval
- Responsible for review, verification and adherence to the Contract requirements and NEI QA Plan

1992-1994 Nytest Environmental, Inc. (NEI) Port Washington, New York
Data Review Manager

- Responsible for the accurate compilation, review and delivery of analytical data to the company's customers. Directly and effectively supervised a department of 22 personnel.
- Managed activities of the data processing software including method development, form creation, and production
- Implement new protocol requirements for report and data management formats
- Maintained control of data storage/archival areas as EPA/CLP document control officer

1987-1991 Nytest Environmental, Inc. (NEI) Port Washington, New York
Data Review Specialist

- Responsible for the review of GC, GC/MS, Metals and Wet Chemistry data in accordance with regulatory requirements
- Proficient with USEPA, NYSDEC, NJDEP and NEESA requirements
- Review data generated in accordance with SW846, NYSDEC ASP, EPA/CLP and 40 CFR Methodologies

1986-1987 Nytest Environmental, Inc (NEI) Port Washington, New York
GC/MS VOA Analyst

EDUCATION:

1982-1985 State University of New York at Stony Brook, New York; BS Biology/Biochemistry
1981-1982 University of Delaware; Biology/Chemistry
5/91 Rutgers University; Mass Spectral Data Interpretation Course, GC/MS Training
8/92 Westchester Community College; Organic Data Validation Course
9/93 Westchester Community College; Inorganic Data Validation Course

Form **W-9**
(Rev. December 2011)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

Name (as shown on your income tax return) L.A.B VALIDATION CORP

Business name/disregarded entity name, if different from above

Check appropriate box for federal tax classification:
☐ Individual/sole proprietor ☐ C Corporation ☒ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶

☐ Other (see instructions) ▶

☐ Exempt payee

Address (number, street, and apt. or suite no.) 14 WEST POINT DRIVE

City, state, and ZIP code EAST NORTHPORT, New York 11731

Requester's name and address (optional)

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

- -

Employer identification number

58-2381714

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here Signature of U.S. person ▶ Lori A. Berger Date ▶ 01/18/13

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

Westchester Community College
Professional Development Center

Awards this Certificate of Achievement To

LORI BEYER

for Successfully Completing

ORGANIC DATA VALIDATION COURSE (35 HOURS)

Dr. John Samuelian

Date AUGUST 1992

Assistant Dean
Professional Development Center

President

The Professional
Development Center

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

Westchester Community College
Professional Development Center

Awards this Certificate of Achievement To

LORI BEYER

for Successfully Completing

INORGANIC DATA VALIDATION

Instructor: Dale Boshart

Date MARCH 1993

Assistant Dean
Professional Development Center

President

The Professional
Development Center

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

July 8, 1992

Ms. Elaine Sall
Program Coordinator
Westchester Community College
Valhalla, NY 10595-1698

Dear Elaine,

Thank you for your letter of June 29, 1992. I have reviewed the course outline for organic data validation, qualifications for teachers and qualifications for students. The course that you propose to offer would be deemed equivalent to that which is offered by EPA. The individuals who successfully complete the course and pass the final written exam would be acceptable to perform the task of organic data validation for the Department of Environmental Conservation, Division of Hazardous Waste Remediation.

As we have discussed in our conversation of July 7, 1992, you will forward to me prior to the August course deadline, the differences between the EPA SOW/90 and the NYSDEC ASP 12/91. You stated these differences will be compiled by Mr. John Samulian.

I strongly encourage you to offer an inorganic data validation course. I anticipate the same list of candidates would be interested in an inorganic validation course as well, since most of the data to be validated consists of both organic and inorganic data.

Thank you for you efforts and please contact me if I can be of any further assistance.

Sincerely,

Maureen P. Serafini

Maureen P. Serafini
Environmental Chemist II
Division of Hazardous Waste
Remediation

**The Professional
Development Center**
AT
WESTCHESTER COMMUNITY COLLEGE

914 285-6619

October 2, 1992

Ms. Lori Beyer
3 sparkill Drive
East Northport, NY 11731

Dear Ms. Beyer:

Congratulations upon successful completion of the Organic Data Validation course held August 17 - 21, 1992, through Westchester Community College, Professional Development Center. This course has been deemed by New York State Department of Environmental Conservation as equivalent to EPA's Organic Data Validation Course.

Enclosed is your Certificate. Holders of this Certificate are deemed competent to perform organic data validation for the New York State DEC Division of Hazardous Waste Remediation.

The Professional Development Center at Westchester Community College plans to continue to offer courses and seminars which will be valuable to environmental engineers, chemists and related personnel. Current plans include a TCLP seminar on November 17th and a conference on Environmental Monitoring Regulations on November 18th.

We look forward to seeing you again soon at another environmental program or event. Again, congratulations.

Very truly yours,

Passing Grade is 70%
Your Grade is 99%

Elaine Sall
Program Coordinator

ES/bf

The Professional
Development Center
AT
WESTCHESTER COMMUNITY COLLEGE

914 285-6619

June 21, 1993

Dear Ms. Beyer:

Enclosed is your graded final examination in the Inorganic Data Validation course you completed this past March. A score of 70% was required in order to receive a certificate of satisfactory completion. Persons holding this certificate are deemed acceptable to perform Inorganic Data Validation for the New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation.

I am also enclosing a course evaluation for you to complete if you have not already done so. The information you provide will greatly aid us in structuring further courses. We wish to make these course offerings as relevant, targeted and comprehensive as possible. Your evaluation is vital to that end.

Congratulations on your achievement. I look forward to seeing you again at another professional conference or course. We will be co-sponsoring an environmental monitoring conference on October 21, 1993 with the New York Water Pollution Control Association, Lower Hudson Chapter, at IBM's Yorktown Heights, NY site. Information regarding this event will be going out in August.

Very truly yours,

Elaine Sall

Elaine Sall
Program Coordinator

ES/bf

Enclosures

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

Qualifications Summary

- Over 30 years of experience in the environmental field and over 40 years in analytical laboratories
- Extensive experience involving management of environmental laboratory operations.
- Involvement with NELAC since its inception and member of "Accreditation Committee"
- ASTM committee member on D-34 "Waste Characterization and Disposal"
- Co-founder of Matrix Analytical, Inc.
- Diverse experience in laboratory from medical, industrial and environmental
- Lab Design for wastewater, water treatment, analytical & environmental facilities for existing & new labs, including equipment selection, casework, hood selection.
  Linear process flow for expansion considerations

James C. Todaro

Quality Assurance Officer

Professional Affiliations

National Environmental Laboratory Accreditation Conference (NELAC)
American Chemical Society (ACS)
American Society for the Testing of Materials (ASTM)
Independent Testing Laboratory Association (ITLA)
Society of American Military Engineers (SAME)

Fields of Expertise

Laboratory Management – Environmental, Analytical, Medical
Marketing and Sales
Laboratory Design

Higher Education

B.A., Biology – Ricker College (1970)
M.T. A.S.C.P. – Norwood Hospital (1971)

Employment History

2007-Present	Alpha Analytical Labs – Quality Assurance Officer,
2005-2007	Alpha Analytical Labs – Laboratory Director - Mansfield
2000-2005	Alpha Analytical Labs – Laboratory Director - Westboro
1983-2000	Matrix Analytical Laboratory – Owner/Laboratory Director
1979-1983	NE Medical Laboratory – Laboratory Director
1976-1979	Corning Medical Diagnostics – Quality Assurance Officer
1974-1976	NE Deaconess Hospital – Emergency Lab Technologist
1971-1974	NE Medical Laboratory – Automated Chem Supervisor

Professional Training/Committees

NELAC/TNI Expert PT Committee

DoD Technical Advisory Group

MassDEP Laboratory Advisory Committee

NJDEP Environmental Laboratory Advisory Committee

ASTM D-34 Waste Management Committee

Certified Instructor 4 hr LEP and LSP CEU courses for: "Interpretation of Analytical Data", "Selection of Organic Methods".

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James C. Todaro

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ASTM D-34 Waste Management Committee

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ATTACHMENT B
SAMPLING, ANALYSIS, AND ASSESSMENT OF PFAS GUIDANCE

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

April 2023

www.dec.ny.gov

Table of Contents

April 2023

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
Data Assessment and Application to Site Cleanup Page 3	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	Until such time as Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	3/28/2023
Water Sample Results Page 3	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.	NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These guidance values also include criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt).Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and the presence of soil source areas, as defined below.	3/28/2023
Soil Sample Results Page 3	Soil cleanup objectives for PFOA and PFOS have been 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:	NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. Until SCOs are in effect, the following are to be used as guidance values:	3/28/2023
Protection of Groundwater Page 3	PFOA (ppb) 1.1 PFOS (ppb) 3.7	PFOA (ppb) 0.8 PFOS (ppb) 1.0	3/28/2023

Citation and Page Number	Current Text	Corrected Text	Date
Footnote 2 Page 3	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).	The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 (https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf). 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).	3/28/2023
Testing for Imported Soil Page 4	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.	If the concentrations of PFOA and PFOS in leachate are at or above the ambient water quality guidance values for groundwater, then the soil is not acceptable.	3/28/2023
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

Citation and Page Number	Current Text	Corrected Text	Date
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
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

Citation and Page Number	Current Text	Corrected Text	Date
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

Citation and Page Number	Current Text	Corrected Text	Date
Routine Analysis, Page XX	Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP)… 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).	Deleted	5/31/2022
Analysis and Reporting, Page XX	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.	Deleted	5/31/2022
Routine Analysis, Page XX	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.	EPA Method 1633 is the procedure to use for environmental samples.	
Soil Sample Results, Page XX	Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6	
Appendix A	"Include in the text… LC-MS/MS for PFAS using methodologies based on EPA Method 537.1"	"Include in the text ….EPA Method 1633"	
Appendix A	"Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101"	Deleted	
Appendix B	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	

Citation and Page Number	Current Text	Corrected Text	Date
Appendix C	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	
Appendix D	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	
Appendix G		Updated to include all forty PFAS analytes in EPA Method 533	
Appendix H		Deleted	
Appendix I	Appendix I	Appendix H	
Appendix H	"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."	"These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER)."	
Appendix H	"The holding time is 14 days…"	"The holding time is 28 days…"	
Appendix H, Initial Calibration	"The initial calibration should contain a minimum of five standards for linear fit…"	"The initial calibration should contain a minimum of six standards for linear fit…"	
Appendix H, Initial Calibration	Linear fit calibration curves should have an R^2 value greater than 0.990.	Deleted	
Appendix H, Initial Calibration Verification	Initial Calibration Verification Section	Deleted	
Appendix H	secondary Ion Monitoring Section	Deleted	
Appendix H	Branched and Linear Isomers Section	Deleted	

April 2023

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

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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

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 G) 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

EPA Method 1633 is the procedure to use for environmental samples. 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. 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).

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]

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[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.

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 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

NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These human health criteria should also be applied to surface water that is used as a water supply. This guidance also includes criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt). Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and 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

NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. 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]	0.8	1.0

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

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[2] The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 (https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf). 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).

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 the ambient water quality guidance values for groundwater, 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 EPA Method 1633
- 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
-
- 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 EPA Method 1633.

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 EPA Method 1633.

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 EPA Method 1633.

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 current SOP developed by the Division of Fish and Wildlife (DFW) entitled "General Fish Handling Procedures for Contaminant Analysis" (Ver. 8). This SOP should be followed when collecting fish for contaminant analysis. Note, however, that the Bureau of Ecosystem Health will not be supplying bags or tags. All supplies are the responsibility of the collector

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.

page ______ of ______

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): ____________________

<u>FOR LAB USE ONLY</u>- 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 sulfonic acids	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluoropentanesulfonic acid	PFPeS	2706-91-4
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorononanesulfonic acid	PFNS	68259-12-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
	Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUnA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTeDA	376-06-7
Per- and Polyfluoroether carboxylic acids	Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
	4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
	Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
	Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6
Fluorotelomer sulfonic acids	4:2 Fluorotelomer sulfonic acid	4:2-FTS	757124-72-4
	6:2 Fluorotelomer sulfonic acid	6:2-FTS	27619-97-2
	8:2 Fluorotelomer sulfonic acid	8:2-FTS	39108-34-4
Fluorotelomer carboxylic acids	3:3 Fluorotelomer carboxylic acid	3:3 FTCA	356-02-5
	5:3 Fluorotelomer carboxylic acid	5:3 FTCA	914637-49-3
	7:3 Fluorotelomer carboxylic acid	7:3 FTCA	812-70-4
Perfluorooctane sulfonamides	Perfluorooctane sulfonamide	PFOSA	754-91-6
	N-methylperfluorooctane sulfonamide	NMeFOSA	31506-32-8
	N-ethylperfluorooctane sulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids	N-methylperfluorooctane sulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethylperfluorooctane sulfonamidoacetic acid	N-EtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanols	N-methylperfluorooctane sulfonamidoethanol	MeFOSE	24448-09-7
	N-ethylperfluorooctane sulfonamidoethanol	EtFOSE	1691-99-2

Group	Chemical Name	Abbreviation	CAS Number
Ether sulfonic acids	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)	9Cl-PF3ONS	756426-58-1
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	11Cl-PF3OUdS	763051-92-9
	Perfluoro(2-ethoxyethane) sulfonic acid	PFEESA	113507-82-7

Appendix H - 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 using EPA Method 1633 for projects within the Division of Environmental Remediation (DER). 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 28 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 six 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%.

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

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

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.

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.

APPENDIX I

SITE MANAGEMENT FORMS

Annual Site-Wide Inspection

Overview of Annual Site-Wide Inspection requirements:

1) General Site conditions at time of inspection;

2) SMP-related Site Activities being conducted, upcoming SMP-related tasks;

3) Institutional Control (IC) Checklist (SMP, FMP maintained on-Site, routine SMP tasks being conducted);

4) Evaluation of Engineering Controls; and

5) Site Documentation.

---

1) General Site conditions at time of inspection:

NAME:	**DATE:**
TIME:	**WEATHER:**
Annual Inspection or Emergency Inspection (if emergency, specify nature)?	

Notes:____

____

____

____

2) Are any SMP-related site activities currently being conducted (SSDS Operation)?

☐ YES ☐ NO

Notes/Details:

____

____

____

____

____

3) IC Checklist (SMP maintained on-Site, routine SMP tasks being conducted)

Copy of SMP on-Site?	☐ YES ☐ NO
Building Use Still Consistent with SMP (Restricted Residential)?	☐ YES ☐ NO

Have the required SMP tasks been conducted during the reporting period?

SSDS inspections/monitoring ☐ YES ☐ NO

Quarterly groundwater monitoring/sampling ☐ YES ☐ NO

Notes:____

____

____

____

4) Evaluation of ECs

Environmental Control Type: Active SSDS	
Are there any unusual odors, spills or leaks near the SSDS piping in the basement? If yes, describe source and plans for repair:	☐ YES ☐ NO
Are the above grade components of the SSDS clean?	☐ YES ☐ NO
Is the SSDS blower running? If yes, describe:	☐ YES ☐ NO
Any evidence of SSDS piping tampering, vandalism or damage on the SSDS piping or system components? If yes, describe:	☐ YES ☐ NO

Notes:____

____

____

____

Environmental Control Type: Site-wide Cover System
Is the cover system intact? ☐ YES ☐ NO If there are significant cracks/breaks/openings, describe the size and location: ____ ____ ____ Are the monitoring wells in good condition? ☐ YES ☐ NO Are the caps locked/bolted down, covers intact, manholes secure, etc.: ____ ____ ____
Are corrective actions required to address the condition of the composite cover system? ☐ YES ☐ NO If yes, describe: ____ ____ ____

The condition of the site-wide cover system is being documented in this inspection log, which will be provided as part of the PRR.

Notes:____

____

____

____

5) Site documentation

Including updates regarding notification to NYSDEC regarding any changes to Site conditions/operations, routine reporting to NYSDEC, etc.).

Notes:____

____

____

____

____

SSDS MONITORING INSPECTION FORM
272 4th Avenue, Brooklyn, New York

Inspector Name:		**Date:**	
Time In:	0:00	**Time Out:**	0:00

General

Weather:	Temperature:	Barometric Pressure:	

1. When was the last rain event?

2. Is the blower currently operating? Yes

If no, please list reason/alarm condition:

3. Any evidence of system tampering, vandalism or damage in the first floor equipment room? - No

4. Is air discharging from the exhaust piping to the roof? -

5. Any evidence of system tampering, vandalism, or damage to the exhaust stack? - No

6. Were all cleanout/sampling port caps securely attached prior to system testing? - Yes

If no, list location and contact Project Manager/Project Director.

7. Is the concrete floor slab overlying all of the SSDS piping runs intact? - Yes

If no, list location and contact Project Manager/Project Director.

SSDS Operations

Blower Inlet PID (ppm)	

Monitoring Point (MP) or Riser Leg (RL) Identification	**Location**	**Applied Vacuum[1] in. H_2O**	**Induced Vacuum[2] in. H_2O**	**Flow Rate[1] cfm**	**Notes**
MP-01	First Floor Lobby	NA		NA	
MP-02	First Floor Retail Space (SE)	NA		NA	
MP-03	First Floor Retail Space (NE)	NA		NA	
SSDS-N1	Building Storage		NA		
SSDS-N2			NA		
SSDS-N3			NA		
Combined applied vacuum on SSDS riser =			NA	NA	

Notes:

1. Normal system flow rates range from 30 to 100 cfm. Applied vacuum readings range from 1 to 10 in. H_2O. System readings will be obtained from each riser leg (SSDS-N1 through SSDS-N3).

2. Normal system induced vacuum readings should be a minimum of 0.004 in. H_2O. System readings will be obtained from each monitoring point (MP-01 through MP-03).

3. If observations are confirmed to be outside of this range, inform emergency contacts in SMP and prepare corrective action plan,

in. of H_2O - inches of water

cfm - cubic feet per minute

SSDS System Shutdown Log
TRACKING FORM
272 4th Avenue, Brooklyn, New York

Date	Time	SSDS or SVE	Message	Unusual conditions on arrival	Restart successful?	Description of persistant problem(s)
MM/DD/YY	HH:MM	SSDS	SSDS High Temperature Alarm	SSDS fan shutdown.	Yes	

APPENDIX J

SSDS COMPONENT SPECIFICATIONS AND OPERATIONS MANUALS

Optimal Distribution
PO Box 1803
Grand Rapids, MI 49501
United States of America
Phone: 1-616-256-8920

Quote

Order No.:	**097037**
Order Date:	5/4/2023
Delivery Date:	
Expire Date:	6/3/2023
Customer ID:	OP1
Currency:	USD

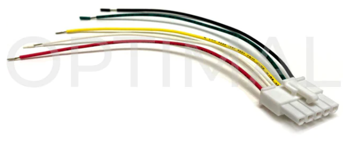
BILL TO:	SHIP TO:
TT Mechanical Corp. 58-10A 59 Street Maspeth NY 11378 United States of America Attn: Emilia Sandecki	TT Mechanical Corp. 58-10A 59 Street Maspeth NY 11378 United States of America Attn: Emilia Sandecki

CUSTOMER P.O. NO.	TERMS	CONTACT
WNJ Pro	Credit Card	Orders@optimaldist.com
FOB POINT	**SHIP VIA**	**SHIPPING DESCRIPTION**
Exworks	UPS GROUND	UPS Ground

NO.	ITEM	OEM P/N	QTY.	UOM	PRICE	EXT. PRICE
1	08393666: Ametek Brushless WNJ 5.7" 100-240VAC 268CFM 45 in.H BP E CL NOTE: In stock and ready to ship.	WP057BU10N18A0009	1.00	EACH	829.57	829.57
2	08393790: Windjammer PRO Power Harness 6.5" NOTE: In stock.	5391741	1.00	EACH	17.68	17.68
3	08393791: Windjammer PRO Speed Control Harness 6.5" NOTE: In stock.	5390771	1.00	EACH	15.16	15.16

--

Thank you for choosing Optimal Distribution.



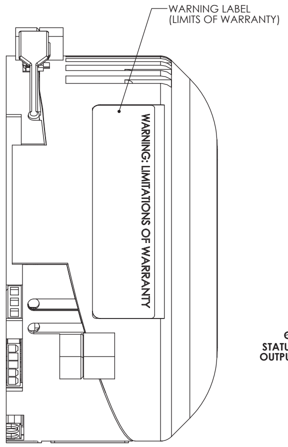
Sales Total:	862.41
Freight & Misc.:	0.00
Tax Total:	0.00
Total (USD):	862.41

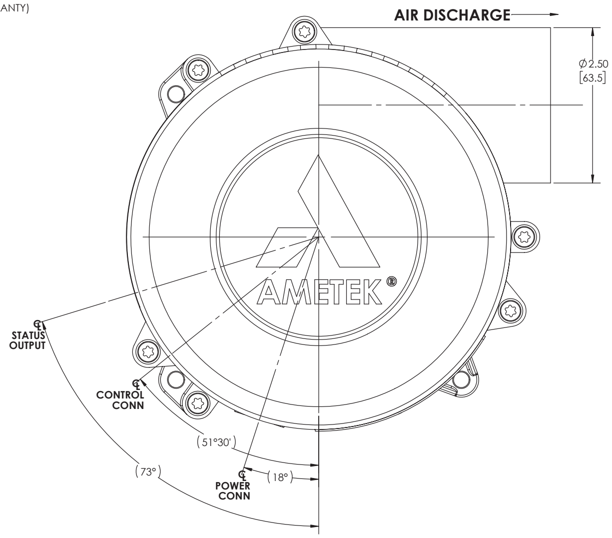
DWG NO. **WP057BU1-0N18A-0009-0** REV. **B**

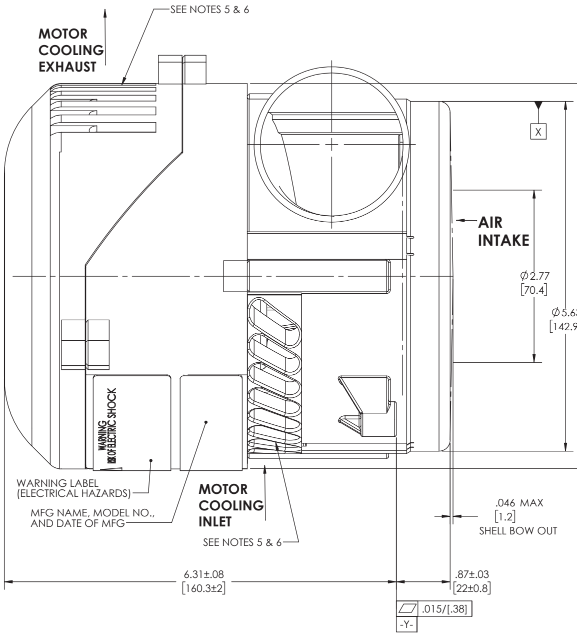
REVISIONS				
REV	ECN NO.	CHANGE	DATE	APP'D
A	DMR #450	RELEASED TO PRODUCTION. MH	9-5-18	KD
B	DE #1988	POWER CONNECTION PIN #3 GROUND WAS NOT USED. MH	8-9-19	M,H

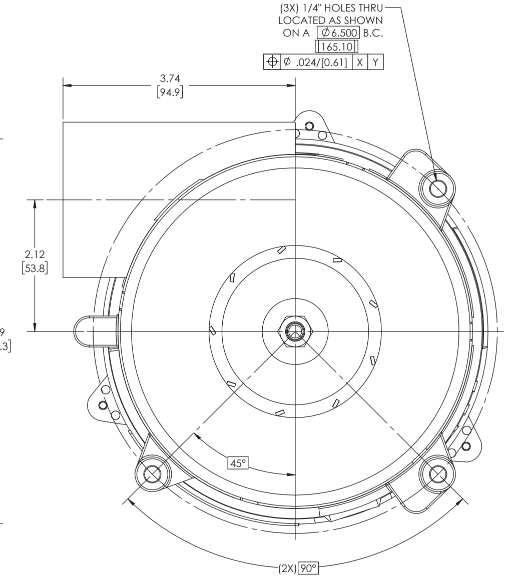
NOTES:

1. RoHS AND REACH COMPLIANCE. REFERENCE AMETEK ENVIRONMENTAL SPECIFICATION ES0010 FOR DETAILS.
2. **POWER CONNECTION:** BLOWER CONNECTOR, MATES WITH CUSTOMER SUPPLIED AMP CONNECTOR PN#350766-1 WITH FEMALE TERMINALS, PN#640310-3 OR EQUIVALENT ON 12GA WIRE 600V, 105°C.
3. **CONTROL CONNECTION:** BLOWER CONNECTOR, MATES WITH CUSTOMER SUPPLIED MOLEX SERIES 5557 CONNECTOR HOUSING, (PN#39-01-4051) WITH FEMALE TERMINALS, (PN#39-00-0208) OR EQUIVALENT ON 22GA, 125°C, 300V WIRE.
4. **STATUS OUTPUT CONNECTOR:** BLOWER CONNECTOR, MATES WITH CUSTOMER SUPPLIED MOLEX CONNECTOR PN#50-29-1662 WITH FEMALE TERMINALS, PN#39-00-0214 OR EQUIVALENT ON 22GA, 125°C, 300V WIRE.
5. ALL INTAKE, EXHAUST, COOLING DUCTS AND VENTS MUST NOT BE OBSTRUCTED BY MOUNTING.
6. MOTOR VENTILATION AIR TO BE FREE OF OILS AND OTHER FOREIGN PARTICLES, (I.E. BREATHING QUALITY AIR). BLOWER TO BE MOUNTED SO THAT MOTOR VENTILATION AIR CANNOT RECIRCULATE.
7. TACH OUTPUT-2 PULSES PER REVOLUTION. SIGNAL IS A FREQUENCY (Hz) INDICATOR OF THE RPM CAN BE MEASURED WITH RESPECT TO GROUND (PIN 5). RPM=TACH. OUT x 30.





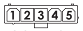




8500-03-01
ANALOG (0-10VDC RANGE)
PULLED DOWN

POWER CONNECTION

PIN #	CONTROL	DESCRIPTION	COLOR
1	INPUT	A/C (LINE)	BLACK
2	INPUT	A/C (NEUTRAL)	WHITE
3	OUTPUT	GROUND	GRN/YEL



CONTROL CONNECTION

PIN #	CONTROL	DESCRIPTION	COLOR
1	INPUT	15V-40V (OPTIONAL)	RED
2	OUTPUT	TACH-OUTPUT	WHITE
3	INPUT	ANALOG (0-10VDC)	YELLOW
4	INPUT	ANALOG (0-10VDC)	GREEN
5	INPUT	COMMON	BLACK

STATUS OUTPUT CONNECTION

PIN #	CONTROL	DESCRIPTION	COLOR
1	OUTPUT	ISOLATED +15VDC	RED
2	OUTPUT	OPEN COLLECTOR TRANSISTOR	BLUE
3	OUTPUT	ISOLATED COMMON	BLACK

CONTROL CHARACTERISTICS M101-M199=MAJOR
REF. ENG. SPEC. K-1 SW

CONFIDENTIAL
THIS PRINT AND THE SPECIFICATIONS ARE THE PROPERTY OF AMETEK, TECHNICAL & INDUSTRIAL PRODUCTS, AND HAS BEEN ISSUED WITH THE UNDERSTANDING THAT IT WILL NOT BE REPRODUCED, REVEALED TO OR USED FOR THE MANUFACTURE FOR OTHERS AND WILL BE RETURNED UPON REQUEST.

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1982

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED
REMOVE BURRS
BREAK SHARP EDGES .005/.020

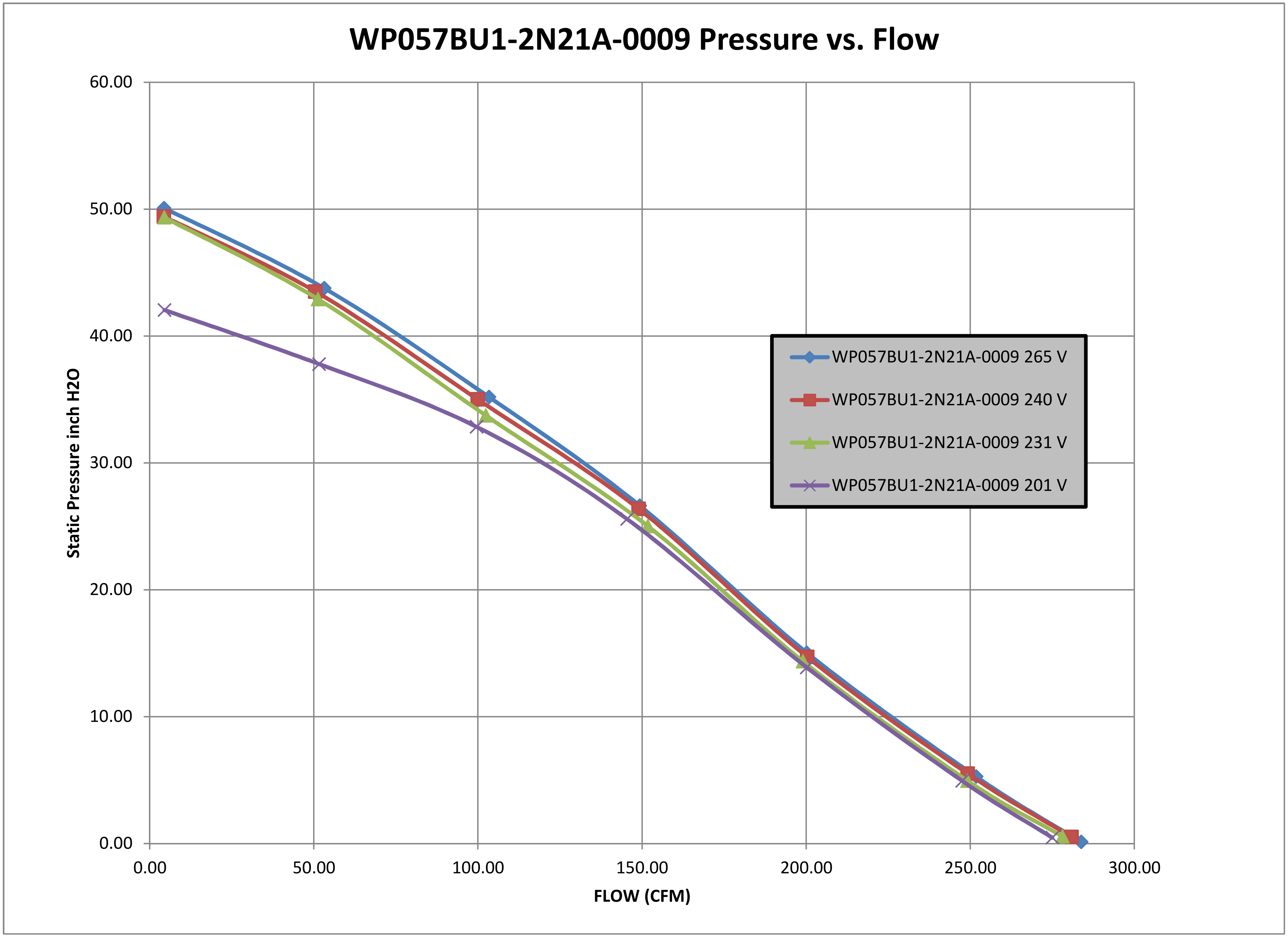
TOLERANCES			
XX	XXX	ANGLES	
±.02	.005	±0°30'	INCH
±0.5	0.13		METRIC

MATERIAL -			
SCALE 1:1	CODE 75511	FINISH SPEC. -	
CAD FILE NAME -		NEXT ASSY. -	WT. 5lb 15oz
ENG. APP'D.: K. DIEHL	DATE: 9-5-18	APP'D.: -	DATE: -
DRAWN BY: M. HELMINK	DATE: 9-5-18	CH'D BY: -	DATE: -

TITLE **5.7" 100-240V WINDJAMMER PRO UHF 0-10VDC , BLWR OUTLINE** SIZE **D**

AMETEK®
TECHNICAL INDUSTRIAL PRODUCTS

E-NO. E-52355
REF. -
SHEET 1 OF 1
DWG NO. **WP057BU1-0N18A-0009-0**


WP057BU1-2N21A-0009 Pressure vs. Flow
Static Pressure inch H2O
60.00
50.00
40.00
30.00
20.00
10.00
0.00
0.00
50.00
100.00
150.00
200.00
250.00
300.00
FLOW (CFM)
WP057BU1-2N21A-0009 265 V
WP057BU1-2N21A-0009 240 V
WP057BU1-2N21A-0009 231 V
WP057BU1-2N21A-0009 201 V

AMETEK, Dynamic Fluid Solutions

Blower Test Report

Test administered by: IOUGHNEY
REA
Serial #
Model under test: WP057BU1-2N21A-0009
Lab Log #
Date: 8/11/2016
Time: 11:25:30

Ambient Temperature	24.4 °C	**Humidity Ratio**	0.0114
Barometric Pressure	28.93 inch Hg	**Air Density**	0.0711 lb/ft^3
Relative Humidity	58.1 %	**Correction Factor**	1.054
		Pipe ID	1.15 inch

Remarks: Press

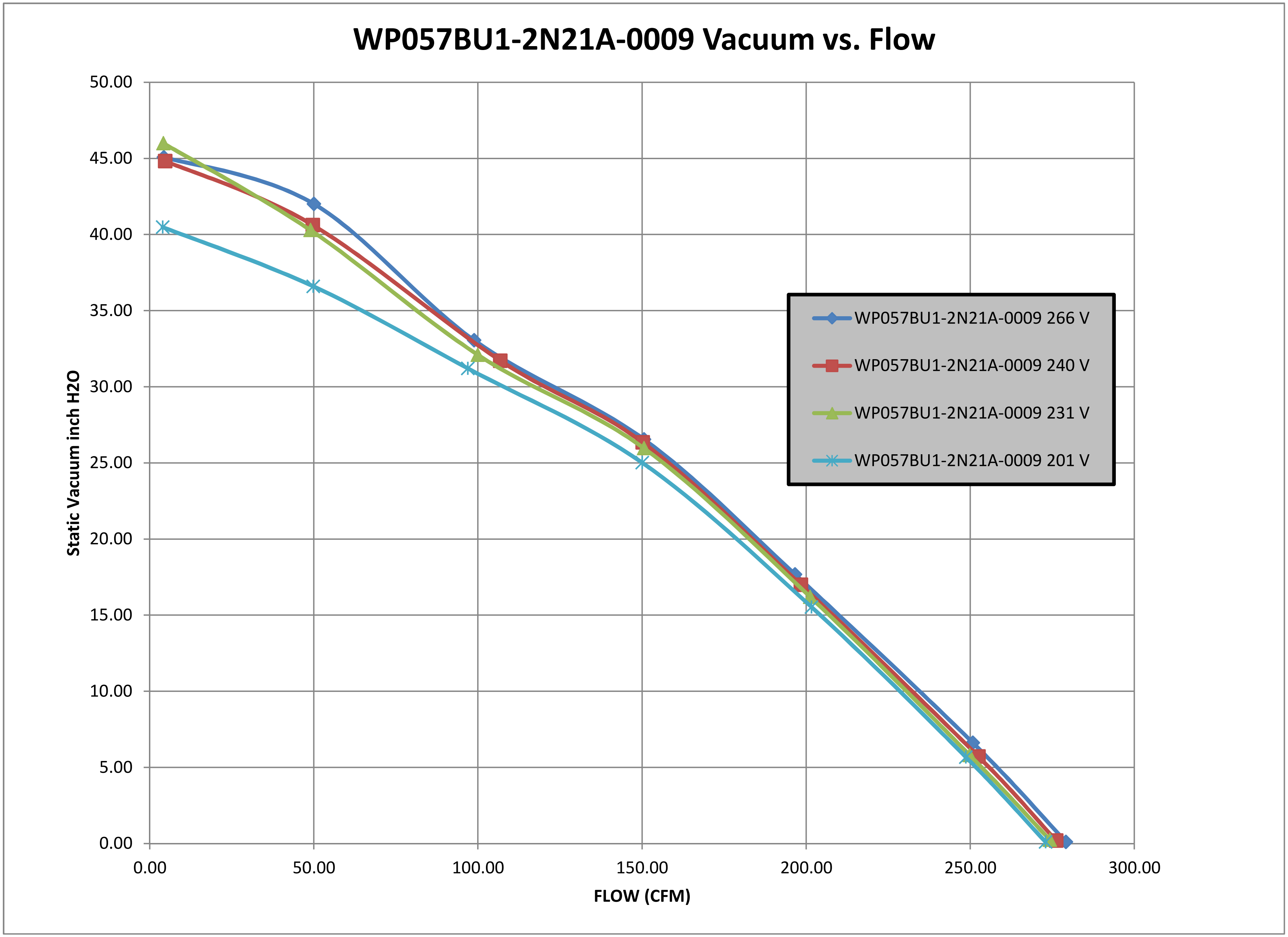
Flow Rate *cfm*	Static Pressure *inch H2O*	Total Pressure *inch H2O*	Current *A*	Power Demand *W*	Voltage *V*	Flow Temperature *°C*	Rotational Speed *rpm*	Static Efficiency *%*	Total Efficiency *%*
283.77	0.12	0.78	13.91	1647.64	264.56	26.73	21360	0.26	1.61
251.78	5.27	5.79	14.04	1670.53	264.74	26.80	19680	9.48	10.41
200.20	15.04	15.37	14.15	1697.45	264.98	27.57	20250	21.20	21.66
149.28	26.63	26.82	13.90	1648.74	264.55	29.11	21180	28.93	29.12
103.39	35.19	35.28	13.73	1628.04	264.69	31.33	22320	26.96	27.03
53.20	43.76	43.79	13.41	1592.73	264.84	34.26	24300	17.77	17.78
4.37	50.08	50.08	11.73	1406.11	264.95	29.73	26160	1.87	1.87
280.83	0.52	1.16	13.43	1617.99	239.64	26.71	21270	1.07	2.41
249.18	5.52	6.03	13.56	1649.84	239.91	26.77	19560	9.94	10.86
200.32	14.71	15.03	13.67	1639.55	239.66	27.48	20190	21.47	21.95
148.97	26.37	26.56	13.48	1629.73	239.73	28.87	21150	28.92	29.12
99.93	35.01	35.09	13.46	1572.31	239.61	31.27	22260	26.84	26.91
50.45	43.51	43.53	13.33	1512.35	239.56	34.20	24330	17.64	17.64
4.33	49.41	49.41	12.91	1350.27	239.66	30.33	26040	1.91	1.91
278.07	0.56	1.19	14.21	1556.31	230.72	25.90	21030	1.19	2.53
249.15	4.95	5.45	14.29	1562.51	230.72	26.09	20580	9.39	10.35
199.01	14.36	14.68	14.38	1579.18	230.70	26.89	19950	21.58	22.07
151.76	25.02	25.21	14.30	1563.63	230.71	28.19	20820	29.06	29.28
102.45	33.73	33.82	13.92	1511.04	230.74	30.74	21900	27.55	27.62
51.29	42.91	42.93	13.69	1497.78	230.75	33.62	24180	17.83	17.84
4.44	49.35	49.35	12.83	1357.06	230.84	30.61	26010	1.95	1.95
274.99	0.46	1.08	15.06	1495.95	200.68	23.53	20820	1.00	2.34
247.53	4.94	5.44	15.30	1519.12	200.66	24.15	20520	9.53	10.50

200.20	13.88	14.21	15.55	1544.05	200.63	25.43	19950	21.38	21.89
145.44	25.58	25.75	15.22	1500.05	200.67	27.50	20790	29.62	29.82
99.60	32.85	32.93	14.57	1422.97	200.73	29.75	21600	27.62	27.69
51.65	37.79	37.81	13.21	1260.41	200.86	31.73	22710	18.70	18.71
4.50	42.05	42.05	10.84	1036.38	201.04	27.62	23970	2.18	2.18

PRESSURE SHEET

Auto Populated don't change

Voltages Tested To			
WP057BU	265	V	
WP057BU	240	V	
WP057BU	231	V	
WP057BU	201	V	
WP057BU	0	V	
WP057BU	0	V	
WP057BU	0	V	
WP057BU	0	V	
WP057BU	0	V	
WP057BU	Pressure	vs.	Flow


WP057BU1-2N21A-0009 Vacuum vs. Flow
Static Vacuum inch H2O
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0.00
50.00
100.00
150.00
200.00
250.00
300.00
FLOW (CFM)
WP057BU1-2N21A-0009 266 V
WP057BU1-2N21A-0009 240 V
WP057BU1-2N21A-0009 231 V
WP057BU1-2N21A-0009 201 V

AMETEK, Dynamic Fluid Solutions

Blower Test Report

Test administered by: IOUGHNEY
Model under test: WP057BU1-2N21A-0009
REA
Lab Log #
Serial #
Date: 8/11/2016
Time: 10:52:58

Ambient Temperature 23.7 °C
Barometric Pressure 28.94 inch Hg
Relative Humidity 59.4 %

Humidity Ratio 0.0112
Air Density 0.0714 lb/ft^3
Correction Factor 1.051
Pipe ID 1.15 inch

Remarks: VAC

Flow Rate *cfm*	Static Vacuum *inch H2O*	Total Vacuum *inch H2O*	Current *A*	Power Demand *W*	Voltage *V*	Flow Temperature *°C*	Rotational Speed *rpm*	Static Efficiency *%*	Total Efficiency *%*
279.13	0.11	2.13	14.09	1690.90	265.78	23.52	20730	0.22	4.16
250.75	6.63	8.25	14.05	1677.00	265.44	23.57	20400	11.72	14.59
196.63	17.68	18.68	14.09	1693.77	265.72	23.18	20490	24.25	25.62
150.64	26.54	27.13	13.85	1655.22	265.60	22.98	21510	28.53	29.16
98.86	33.05	33.30	13.45	1605.25	265.76	22.85	23040	24.03	24.22
50.01	42.01	42.08	13.14	1573.53	265.98	22.76	25380	15.76	15.79
4.32	45.08	45.08	10.60	1279.30	265.94	22.71	26520	1.80	1.80
276.19	0.20	2.17	13.45	1627.35	240.36	23.35	20670	0.40	4.36
252.48	5.72	7.36	13.55	1649.52	240.57	23.42	20370	10.34	13.33
198.37	17.00	18.02	13.84	1641.49	240.55	23.06	20370	24.27	25.72
150.20	26.35	26.93	13.27	1614.41	240.52	22.85	21420	28.95	29.59
106.85	31.71	32.01	13.16	1565.40	240.61	22.72	22620	25.54	25.78
49.67	40.63	40.69	13.02	1442.13	240.55	22.63	24930	16.51	16.53
4.74	44.82	44.82	11.32	1231.91	240.68	22.55	26400	2.03	2.03
274.23	0.25	2.19	15.46	1636.70	230.75	22.79	20550	0.49	4.33
249.82	5.81	7.42	15.44	1634.56	230.74	22.95	20250	10.49	13.40
201.24	16.20	17.24	15.39	1634.80	230.67	22.66	20250	23.53	25.05
150.59	25.96	26.55	15.41	1613.82	230.80	22.52	21270	28.58	29.22
99.94	32.10	32.36	14.97	1518.87	230.54	22.35	22680	24.90	25.10
49.00	40.29	40.35	13.88	1444.90	230.91	22.27	24780	16.11	16.13
4.17	45.99	45.99	12.84	1293.17	230.63	22.20	26850	1.75	1.75
279.85	0.11	2.14	16.20	1676.23	218.45	22.67	20940	0.22	4.21
249.45	6.61	8.21	16.34	1635.35	218.53	22.79	20400	11.89	14.79

200.93	16.89	17.93	16.34	1629.46	218.53	22.42	20490	24.55	26.07
149.13	26.60	27.17	16.12	1587.18	218.56	22.24	21480	29.45	30.09
99.34	32.69	32.94	15.74	1527.67	218.61	22.08	22920	25.04	25.23
53.05	39.89	39.97	15.23	1438.80	218.68	21.97	24720	17.32	17.35
4.29	44.53	44.53	12.69	1223.31	218.84	21.91	26370	1.84	1.84

272.94	0.11	2.03	15.42	1531.06	200.59	21.66	20340	0.23	4.27
248.67	5.68	7.28	15.56	1542.01	200.57	22.21	20040	10.79	13.83
201.65	15.53	16.58	15.58	1542.20	200.57	21.82	20040	23.91	25.52
150.04	25.01	25.60	15.11	1504.56	200.60	21.66	21210	29.36	30.04
96.91	31.21	31.45	15.32	1400.75	200.65	21.50	22350	25.40	25.60
49.84	36.60	36.66	14.43	1224.36	200.79	21.40	23550	17.52	17.55
3.96	40.48	40.48	11.14	1044.41	200.95	21.36	24930	1.81	1.81

VACUUM SHEET

Auto Populated don't change

Voltages Tested To

WP057BU	266	V	
WP057BU	240	V	
WP057BU	231	V	
WP057BU	218	V	
WP057BU	201	V	
WP057BU	0	V	
WP057BU	0	V	
WP057BU	0	V	
WP057BU	0	V	
WP057BU	Vacuum	vs.	Flow

Stainless Steel Vapor Pin® Sampling Device

★★★★★

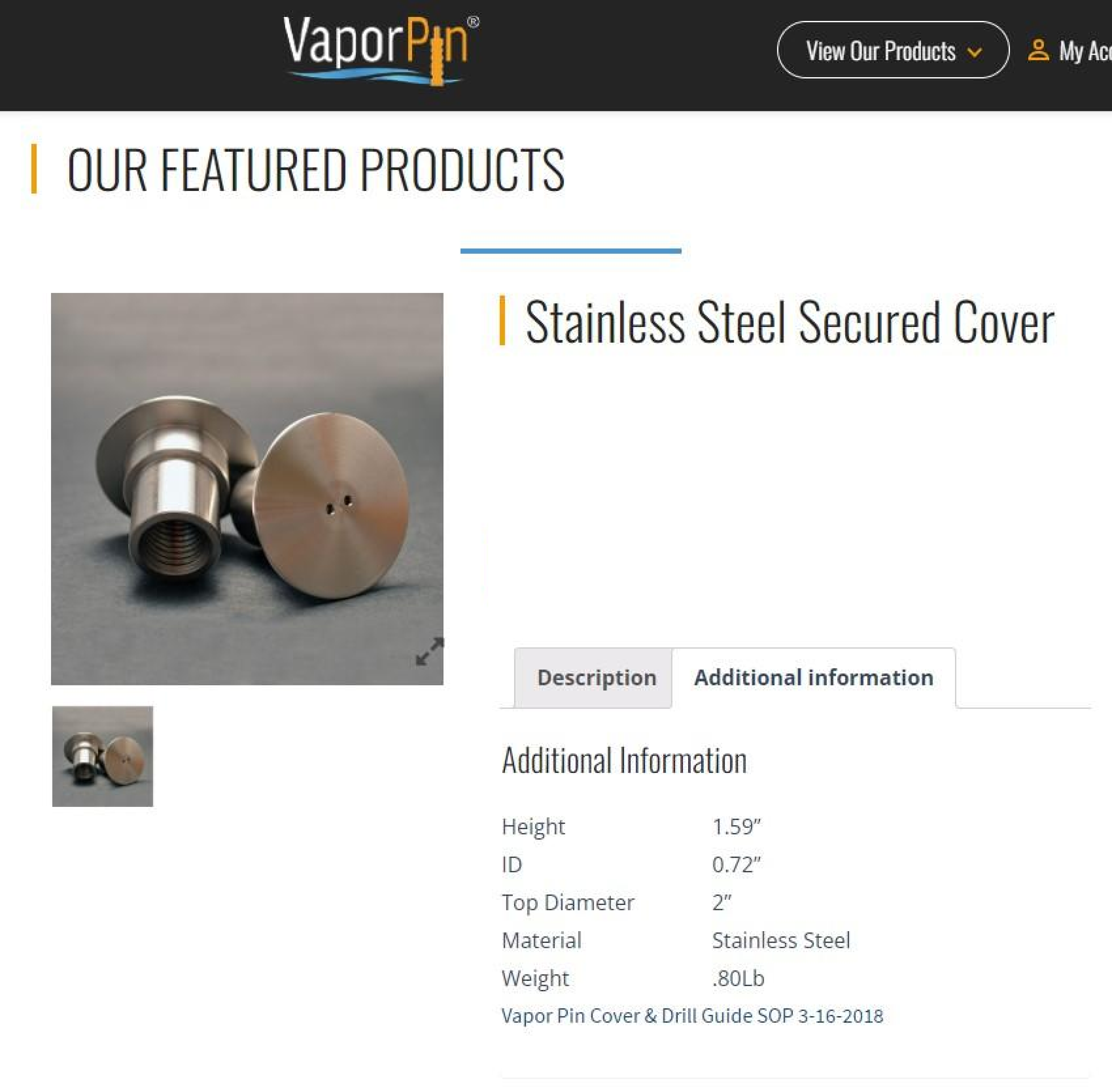
Shannon.Petch – July 21, 2014:

I have had the opportunity to use these vapor pins on several vapor intrusion projects recently and cannot say enough good things about this technology!! One such project included numerous residential and commercial properties that are part of the Brownfield Cleanup Program. Of the literally hundreds of pins we installed, we only needed to provide additional help getting a tight seal (i.e. plumber's wax) on TWO of them (and

Additional Information

Length:	**3.22"**
ID:	0.13
Material:	Stainless Steel
Weight:	.15Lb

Vapor Pin SOP 3-16-2018 Web



OUR FEATURED PRODUCTS

Stainless Steel Secured Cover

Additional Information

Height	1.59″
ID	0.72″
Top Diameter	2″
Material	Stainless Steel
Weight	.80Lb

Vapor Pin Cover & Drill Guide SOP 3-16-2018

VaporPin®

Standard Operating Procedure
Installation of the Vapor Pin® Insert

June 2020

Scope:

This standard operating procedure describes the installation the Vapor Pin® Insert (Figure 1).

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Vapor Pin® Insert. The Vapor Pin® Insert is used to facilitate the collection of soil gas samples and pressure measurements beneath engineered vapor intrusion barriers (e.g., Geo-Seal®), or vapor mitigation coatings (e.g., Retro-Coat™).

Equipment Needed:

- Vapor Pin® Insert;
- Vapor Pin® Insert Cap;
- Hacksaw (optional);
- Power drill and small diameter bits (optional);
- Threaded rod (1/2” x 13); and
- Dead blow hammer.

Installation Procedure (New Construction):

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Locate the desired position (horizontally and vertically) of the top of the Vapor Pin® Insert.

3) Pierce the barrier with a threaded rod of sufficient length to extend slightly above the elevation of the finished floor and into the subgrade a sufficient depth to provide support for the Vapor Pin® Insert. Make sure the rod is perpendicular to the proposed floor surface. Avoid bending the rod, as it may inhibit its removal after the concrete has cured. Also avoid damaging the threads on the rod.

4) Dry fit the Vapor Pin® Insert and trim, or extend the length. Extend the length by sliding the Insert into a length of 1.5 inch diameter schedule 40 PVC pipe. The insert and pipe can be joined using PVC cement or similar material. Allow sufficient time for the adhesive to cure prior to sampling. Vent holes may be added at the bottom of the Insert or PVC extension to promote air flow.

5) Assemble the Vapor Pin® Insert and Cap by pressing the Cap into the top of the Insert. Position the assembly on the threaded rod so that the top of the Cap lies flush with the elevation of the finished floor. It is important that the position of the Insert be perpendicular to the slab so that the Vapor Pin® Secure Cover meets uniformly with the floor.

6) Marry the barrier to the Insert per the manufacture’s specification prior to pouring the concrete slab.

7) After the concrete has set, remove the threaded rod and Cap and install the Vapor Pin® or FLX-VP Vapor Pin® product in the Insert.

Installation Procedure (Exisiting Construction:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Prior to installation in an existing slab, a large diameter hole must be cored through the slab to either expose the barrier, or provide access to the base beneath the slab prior to the application of a vapor mitigation coating. Contact the vendor of the barrier or coating about the desired diameter of the hole, the procedures used to expose the seal, and the methods and materials used to marry the seal or coating to the Insert prior to proceeding.

3) Locate the desired position (horizontally and vertically) of the top of the Vapor Pin® Insert.

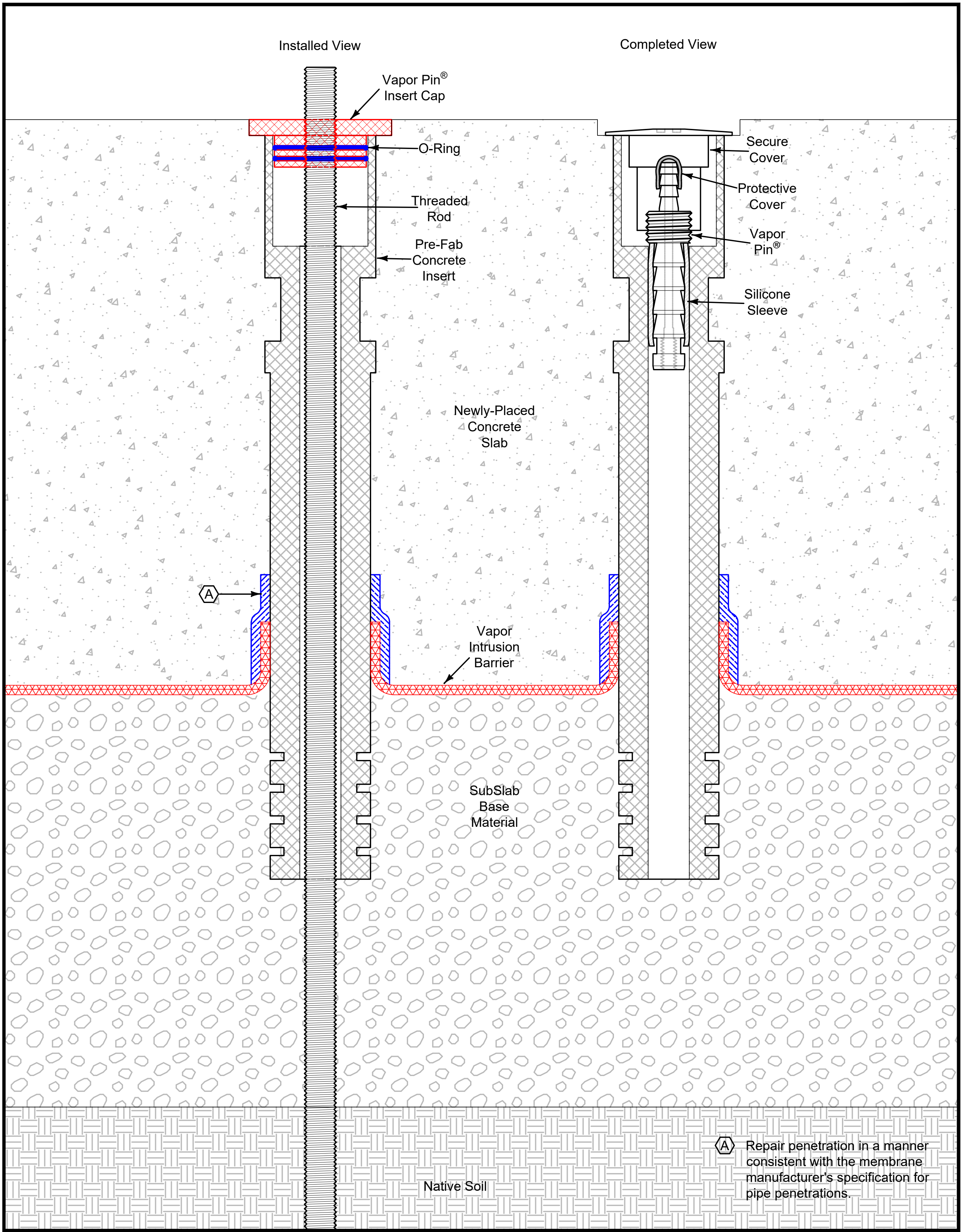
4) Pierce the barrier (if applacble) with a threaded rod of sufficient length to extend slightly above the elevation of the finished floor and into the subgrade a sufficient depth to provide support for the Vapor Pin® Insert. Make sure the rod is perpendicular to the proposed floor surface. Avoid bending the rod, as it may inhibit its removal after the concrete has cured. Also avoid damaging the threads on the rod.

5) Dry fit the Vapor Pin® Insert and trim, or extend the length. Extend the length by sliding the Insert into a length of 1.5 inch diameter schedule 40 PVC pipe. The insert and pipe can be joined using PVC cement or similar material. Allow sufficient time for the adhesive to cure prior to sampling. Vent holes may be added at the bottom of the Insert or PVC extension to promote air flow.

6) Assemble the Vapor Pin® Insert and Cap by pressing the Cap into the top of the Insert. Position the assembly on the threaded rod so that the top of the Cap lies flush with the elevation of the finished floor. It is important that the position of the Insert be perpendicular to the slab so that the Vapor Pin® Secure Cover meets uniformly with the floor.

7) If the Insert is used in conjunction with a vapor intrusion barrier, marry the barrier to the Insert per the barrier manufacture’s specification prior to pouring the concrete slab.

8) After the concrete has set, remove the threaded rod and Cap and install the Vapor Pin® or FLX-VP Vapor Pin® product in the Insert.



Ⓐ Repair penetration in a manner consistent with the membrane manufacturer's specification for pipe penetrations.

VaporPin®

Vapor Pin® Insert with Cap,

Vapor Pin Enterprises, Inc.

Figure

1

Standard Operating Procedure Installation and Extraction of the Vapor Pin®

Updated March 16, 2018

Scope:

This standard operating procedure describes the installation and extraction of the VAPOR PIN® for use in sub-slab soil-gas sampling.

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the VAPOR PIN® for the collection of sub-slab soil-gas samples or pressure readings.

Equipment Needed:

- Assembled VAPOR PIN® [VAPOR PIN® and silicone sleeve(Figure 1)]; Because of sharp edges, gloves are recommended for sleeve installation;
- Hammer drill;
- 5/8-inch (16mm) diameter hammer bit (hole **must** be 5/8-inch (16mm) diameter to ensure seal. It is recommended that you use the drill guide). (Hilti™ TE-YX 5/8" x 22" (400 mm) #00206514 or equivalent);
- 1½-inch (38mm) diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch (19mm) diameter bottle brush;
- Wet/Dry vacuum with HEPA filter (optional);
- VAPOR PIN® installation/extraction tool;
- Dead blow hammer;
- VAPOR PIN® flush mount cover, if desired;
- VAPOR PIN® drilling guide, if desired;
- VAPOR PIN® protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel for repairing the hole following the extraction of the VAPOR PIN®.

Figure 1. Assembled VAPOR PIN®

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) If a flush mount installation is required, drill a 1½-inch (38mm) diameter hole at least 1¾-inches (45mm) into the slab. Use of a VAPOR PIN® drilling guide is recommended.

4) Drill a 5/8-inch (16mm) diameter hole through the slab and approximately 1-inch (25mm) into the underlying soil to form a void. Hole **must** be 5/8-inch (16mm) in diameter to ensure seal. It is recommended that you use the drill guide.

VAPOR PIN® protected under US Patent # 8,220,347 B2, US 9,291,531 B2 and other patents pending

5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.

6) Place the lower end of VAPOR PIN® assembly into the drilled hole. Place the small hole located in the handle of the installation/extraction tool over the vapor pin to protect the barb fitting, and tap the vapor pin into place using a dead blow hammer (Figure 2). Make sure the installation/extraction tool is aligned parallel to the vapor pin to avoid damaging the barb fitting.

Figure 2. Installing the VAPOR PIN®

During installation, the silicone sleeve will form a slight bulge between the slab and the VAPOR PIN® shoulder. Place the protective cap on VAPOR PIN® to prevent vapor loss prior to sampling (Figure 3).

Figure 3. Installed VAPOR PIN®

7) For flush mount installations, cover the vapor pin with a flush mount cover, using either the plastic cover or the optional stainless-steel Secure Cover (Figure 4).

Figure 4. Secure Cover Installed

8) Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.

9) Remove protective cap and connect sample tubing to the barb fitting of the VAPOR PIN®. This connection can be made using a short piece of Tygon™ tubing to join the VAPOR PIN® with the

Nylaflow tubing (Figure 5). Put the Nylaflow tubing as close to the VAPOR PIN® as possible to minimize contact between soil gas and Tygon™ tubing.

Figure 5. VAPOR PIN® sample connection

10) Conduct leak tests in accordance with applicable guidance. If the method of leak testing is not specified, an alternative can be the use of a water dam and vacuum pump, as described in SOP Leak Testing the VAPOR PIN® via Mechanical Means (Figure 6). For flush-mount installations, distilled water can be poured directly into the 1 1/2 inch (38mm) hole.

Figure 6. Water dam used for leak detection

11) Collect sub-slab soil gas sample or pressure reading. When finished, replace the protective cap and flush mount cover until the next event. If the sampling is complete, extract the VAPOR PIN®.

Extraction Procedure:

1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the VAPOR PIN® (Figure 7). Turn the tool clockwise continuously, don't stop turning, the VAPOR PIN® will feed into the bottom of the installation/extraction tool and will extract from the hole like a wine cork, DO NOT PULL.

2) Fill the void with hydraulic cement and smooth with a trowel or putty knife.

Figure 7. Removing the VAPOR PIN®

- Prior to reuse, remove the silicone sleeve and protective cap and discard. Decontaminate the VAPOR PIN® in a hot water and Alconox® wash, then heat in an oven to a temperature of 265° F (130° C) for 15 to 30 minutes. For both steps, **STAINLESS – ½ hour, BRASS 8 minutes**

3) Replacement parts and supplies are available online.

Schedule 40 PVC Pipe Dimensions

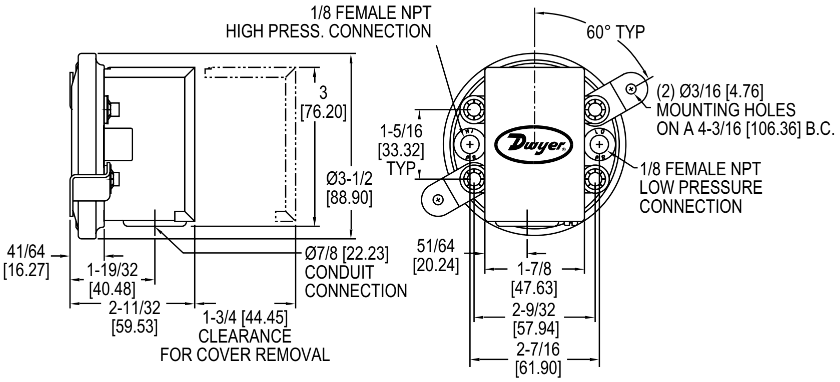
Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.	Maximum W.P. PSI*
1/8	0.405	0.249	0.068	0.051	810
1/4	0.540	0.344	0.088	0.086	780
3/8	0.675	0.473	0.091	0.115	620
1/2	0.840	0.602	0.109	0.170	600
3/4	1.050	0.804	0.113	0.226	480
1	1.315	1.029	0.133	0.333	450
1-1/4	1.660	1.360	0.140	0.450	370
1-1/2	1.900	1.590	0.145	0.537	330
2	2.375	2.047	0.154	0.720	280
2-1/2	2.875	2.445	0.203	1.136	300
3	3.500	3.042	0.216	1.488	260
3-1/2	4.000	3.521	0.226	1.789	240
4	4.500	3.998	0.237	2.118	220
5	5.563	5.016	0.258	2.874	190
6	6.625	6.031	0.280	3.733	180
8	8.625	7.942	0.322	5.619	160
10	10.750	9.976	0.365	7.966	140
12	12.750	11.889	0.406	10.534	130
14	14.000	13.073	0.437	12.462	130
16	16.000	14.940	0.500	16.286	130
18	18.000	16.809	0.562	20.587	130
20	20.000	18.743	0.593	24.183	120
24	24.000	22.544	0.687	33.652	120

COMPACT LOW DIFFERENTIAL PRESSURE SWITCHES

Set Points from 0.07 to 20 in w.c. Repetitive Accuracy within 3%

Series 1910 switch with conduit enclosure off. Shows electric switch and set point adjustment screw located on same side for easy installation.

VIDEO ONLINE



The Dwyer-engineered force-motion amplifier increases the leverage of diaphragm movement and results in a switch with excellent sensitivity and repeatability.

Our most popular **Series 1900 Compact Low Differential Pressure Switches** combine advanced design and precision construction to make these switches able to perform many of the tasks of larger, costlier units. Designed for air conditioning service, they also serve many fluidics, refrigeration, oven and dryer applications. Series 1900 switches have set points from 0.07 to 20 in w.c. (1.8 to 508 mm). Set point adjustment is easy with range screw located inside conduit enclosure. Internal location helps prevent tampering. UL, CE and CSA listed, and FM approved. For use with air or compatible gages.

BENEFITS/FEATURES

- Compact size and repeatability, provides a high-value switch for many industrial and OEM applications
- Wide range of models from 0.07 in w.c. to 20 in w.c. can meet exacting OEM specifications for a low pressure switch
- Range screw protected inside enclosure provides simplifies making adjustments but prevents tampering

APPLICATIONS

- Air conditioning refrigeration coil icing detection; defrost cycle initiation
- Clogged filter detection
- Variable air volume controller

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Temperature Limits: -30 to 180°F (-34 to 82.2°C).
Pressure Limits: 45 in w.c. (11.2 kPa) continuous, 10 psig (68.95 kPa) surge.
Switch Type: Single-pole double-throw (SPDT).
Repeatability: ±3%.
Electrical Rating: 15 A @ 120-480 VAC, 60 Hz. Resistive 1/8 HP @125 VAC, 1/4 HP @ 250 VAC, 60 Hz. Derate to 10 A for operation at high cycle rates.
Electrical Connections: 3 screw type, common, normally open and normally closed.
Process Connections: 1/8˝ female NPT.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Set Point Adjustment: Screw type inside conduit enclosure.
Weight: 1 lb 4.5 oz (581 g).
Compliance: CE, CSA, FM, and UL. Optional-EXPL explosion-proof enclosure does not possess any compliance.

MODEL CHART

		Approximate Deadband	
Model	**Operating Range in w.c.**	**At Min. Set Point**	**At Max. Set Point**
1910-00	0.07 to 0.15	0.04	0.04
1910-0	0.15 to 0.5	0.10	0.10
1910-1	0.40 to 1.6	0.15	0.16
1910-5	1.40 to 5.5	0.30	0.30
1910-10	3.0 to 11.75	0.40	0.40
1910-20	4.0 to 20.0	0.40	0.50

ACCESSORIES

Model	Description
A-302F-A	303 SS static pressure tip with mounting flange; for 3/16˝ ID rubber or plastic tubing; 4˝ insertion depth; includes mounting screws
A-329	Street ell; brass adaptor for applications requiring right angle connections; two required for differential pressures
A-399	Duct pressure monitor kit; for use with standard or manual reset model switches; includes mounting flange, tubing and adapters
A-489	4˝ straight static pressure tip with flange

OPTIONS

Weatherproof Housing

16 ga. steel enclosure with gasketed cover (NEMA 4, IP66) for wet or oily conditions. Withstands 200 hour salt spray test. Wt. 5-1/2 lb (2.5 kg). Switch must be factory installed.

Note: To order, change 1910 base number to 1911, add -WP suffix.
Example: 1911-1-WP

Explosion-Proof Housing

Cast iron base with brass cover. Rated Class I, Groups D; Class II, Div. 2, Groups E, F, G; Class III and NEMA 7, 9 NEMA 3. (7 lb). Switch must be factory installed.

Note: To order, change 1910 base number to 1911, add -EXPL suffix.
Example: 1911-1-EXPL

Manual Reset Option (Model 1900 MR)

Includes special snap switch which latches on pressure increase above the setpoint. Switch must be manually reset after pressure drops below the setpoint. Available on -1, -5,-10 or -20 ranges only. Option is not UL, CSA or FM listed. For use only in single positive pressure applications.

Note: To order, change 1910 base number to 1900, add -MR suffix.
Example: 1900-10-MR

Manual reset option

USA: California Proposition 65
⚠**WARNING:** This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Process Tubing Options: See page 453 (Gage Tubing Accessories)

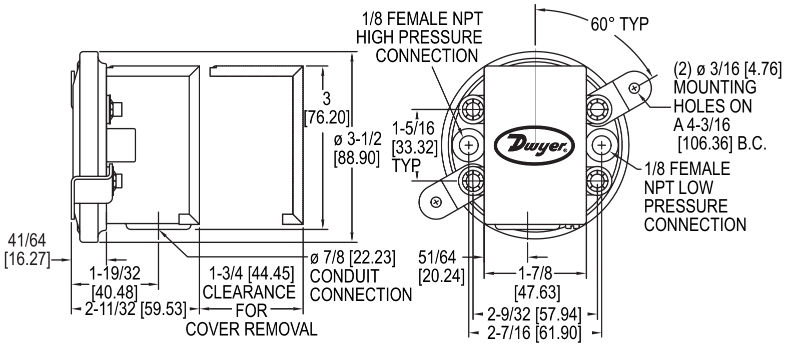
Bulletin E-56

Series 1900 Pressure Switch

Specifications - Installation and Operating Instructions

Series 1910 pressure switch. All pressure and electrical connections and set point adjustments are on one side for easy installation.

Series 1910 switch with conduit enclosure off. Shows electric switch and set point adjustment screw.

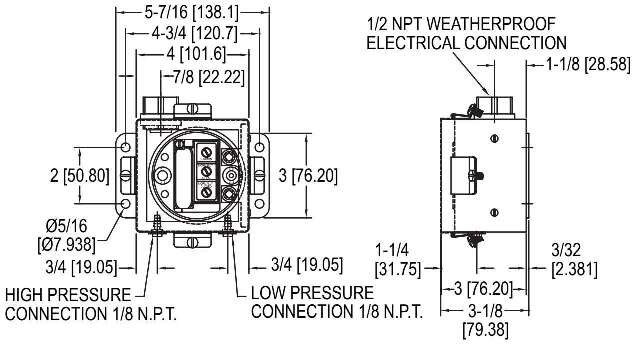


The Dwyer-engineered force-motion amplifier increases the leverage of diaphragm movement and results in a switch with excellent sensitivity and repeatability.

Advanced design and precision construction permit these switches to perform many of the tasks of larger, costlier units. Designed for air conditioning service, they also serve many fluidics, refrigeration, oven and dryer applications. For use with air and non-combustible gases. **Series 1900 Pressure Switches** are available with set points of 0.07 to 20 inches water column. Set point adjustment can be made easily - before or after installation. Range screw is inside conduit enclosure to help prevent tampering. For easy mounting and access, pressure and electrical connections and set point adjustment are located on one side. This permits installation in corners or spaces too small for other switches.

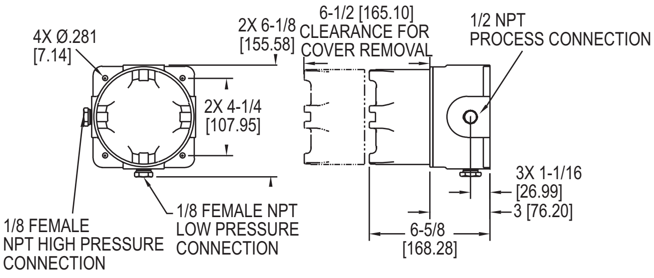
SPECIAL MODELS & ACCESSORIES

Special close coupled street elbow for right angle pressure connections. Can be installed on switch anytime. Zinc plated aluminum.



Weatherproof Housing

16 ga. steel enclosure with gasketed cover (NEMA 4) for wet or oily conditions. Withstands 200 hour salt spray test. Wt. 5 lbs. (2.3 kg). Switch must be factory installed. Change 1910 base number to 1911 and add -WP suffix. Example: 1911-1-WP.



Explosion-Proof Housing

NEMA 7, 9 NEMA 3. (7 lbs). Switch must be factory installed. Change model to 1911 and add -EXPL suffix. Example: 1911-1-EXPL. Aluminum base and cover rated Class I, Groups C & D, Div. 1. Class II, Groups E, F, & G, Div. 1.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Environment: Standard model intended for indoor use.
Wetted Materials: Consult factory.
Temperature Limits: -30 to 180°F (-34 to 82.2°C) (32°F for non dry air).
Pressure Limits: 45 in w.c. (11.2 kPa) continuous, 10 psig (68.95 kPa) surge.
Humidity Limit: 80% RH (non-condensing).
Altitude Limit: 6560 ft (2000 m) max.
Switch Type: Single-pole double-throw (SPDT).
Repeatability: ±3%.
Electrical Rating: 15 A @ 120-480 VAC (~), 60 Hz. Resistive 1/8 HP @125 VAC(~), 1/4 HP @ 250 VAC(~), 60 Hz. Derate to 10 A for operation at high cycle rates.
Electrical Connections: 3 screw type, common, normally open and normally closed.
Installation Category: III (transient over-voltage).
Process Connections: 1/8″ female NPT.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Set Point Adjustment: Screw type inside conduit enclosure.
Pollution Degree: 2.
Weight: 1lb. 4.5 oz. (581 g).
Agency Approvals: CE, UL, CSA, FM.

EXPLANATION OF SYMBOLS

Symbol	Publication	Description
~	IEC 60417 - 5032	Alternating current
⏚	IEC 60417 - 5019	Protective conductor terminal

SERIES 1910 SWITCHES - MODELS OPERATING RANGES, DEADBANDS

Model	Operating Range, in w.c.	Approximate Dead Band At Min. Set Point	Approximate Dead Band At Max. Set Point
1910-00	0.07 to 0.15	0.04	0.04
1910-0	0.15 to 0.5	0.10	0.10
1910-1	0.40 to 1.6	0.15	0.16
1910-5	1.40 to 5.5	0.30	0.30
1910-10	3.0 to 11.75	0.40	0.40
1910-20	4.0 to 20.0	0.40	0.50

INSTALLATION

1. Select a location that is free from excessive vibration, corrosive atmosphere and where the ambient temperature is within the limits for these switches.

2. Mount standard switches with the diaphragm in a vertical plane and with switch lettering and nameplate in an upright position. Some switches are position sensitive and may not reset properly unless they are mounted with the diaphragm vertical. (Special units can be furnished for other than vertical mounting arrangements if required.)

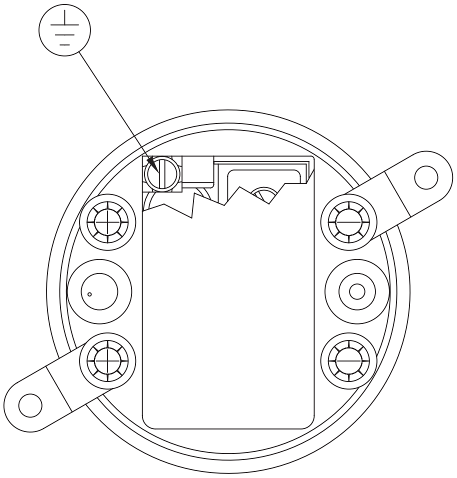
3. Connect switch to source of pressure, vacuum or differential pressure. Metal tubing with 1/4˝ O.D. is recommended, but any tubing which will not restrict the air flow can be used. Connect to the two 1/8˝ female NPT pressure ports as noted below:
   - Differential pressures - connect pipes or tubes from source of greater pressure to high pressure port marked HI-PR and from source of lower pressure to low pressure port marked LO-PR.
   - Pressure only (above atmospheric) - connect tube from source of pressure to high pressure port. The low pressure port is left open to atmosphere.
   - Vacuum only (below atmospheric pressure) - connect tube from source of vacuum to low pressure port. The high pressure port is left open to atmosphere.

⚠ CAUTION Power must be off while wiring connections are being made.

4. Electrical connections to the standard single pole, double throw snap switch are provided by means of screw terminals marked “common”, “norm open”, and “norm closed”. The normally open contacts close and the normally closed contacts open when pressure increases beyond the set point.

⚠ CAUTION Do not exceed the specified voltage rating. Permanent damage not covered by warranty may result.

5. Switch loads should not exceed the maximum specified current rating of 15 amps resistive. Switch capabilities decrease with high load inductance or rapid cycle rates. Whenever an application involves either of these factors, the user may find it desirable to limit the switched current to 10 amps or less in the interest of prolonging switch life.



OPERATION

Pressure acting on the power diaphragm rotates the amplifying lever, which in turn extends the range spring and rotates the snap switch input lever. When the set point is reached, the snap switcch is actuated and the electrical contacts make or break.

ADJUSTMENT

To change the set point, proceed as follows:

A. Remove the snap-on cover from the conduit enclosure by loosening its retaining screw and pulling firmly at its bottom end. Turn the slotted adjustment screw at the top of range spring housing clockwise to raise the set point pressure and counter-clockwise to lower the set point.

B. The recommended procedure for calibrating or checking calibration is to use a “T” assembly with three rubber tubing leads, all as short as possible and the entire assembly offering minimum flow restriction. Run one lead to the pressure switch, another to the manometer of known accuracy and appropriate range, and apply pressure through the third tube. Make final approach to the set point very slowly. Note that manometer and pressure switch will have different response times due to different internal volumes, lengths of tubing, fluid drainage etc. Be certain the switch is checked in the position it will assume in use, i.e. with diaphragm in a vertical plane and switch lettering and nameplate in an upright position.

C. For highly critical applications it is a good idea to check the set point adjustment and reset it as necessary once or twice in the first few months of operation. This will compensate for any change in initial tension which may occur in the spring and diaphragm. For most applications this change will not be significant and no resetting will be required.

MAINTENANCE

Moving parts of these switches are sealed in and are permanently tamper proof. The single adjustment is that of the set point. Care should be taken to keep the switch reasonably dry and free from dust or dirt. No lubrication or unusual precautions are required for normal use.

Dwyer®

SERIES 2000 | MAGNEHELIC® DIFFERENTIAL PRESSURE GAGES

Standard Magnehelic® gage

High Accuracy Magnehelic® gage
Shown with optional -SS bezel

BENEFITS/FEATURES

- **Easy to read gage through undistorted plastic face permits viewing from far away**
- **Patented design provides quick response to pressure changes means no delay in assessing critical situations**
- **Durable and rugged housing and high-quality components combine to provide long service life and minimized down-time**

APPLICATIONS

- Filter monitoring
- Air velocity with Dwyer® pitot tube
- Blower vacuum monitoring
- Fan pressure indication
- Duct, room, or building pressures
- Clean room positive pressure indication

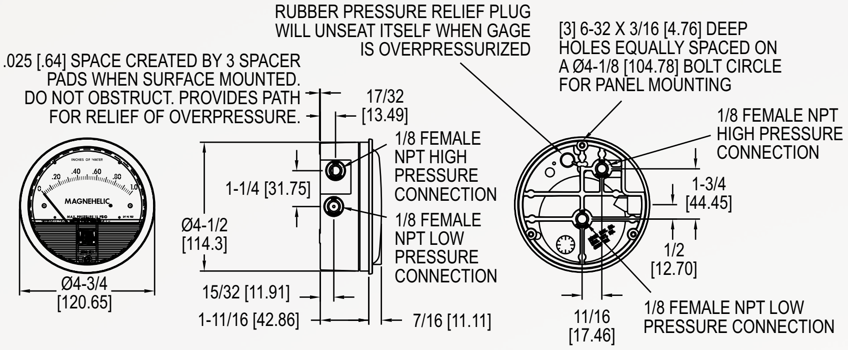
DESCRIPTION

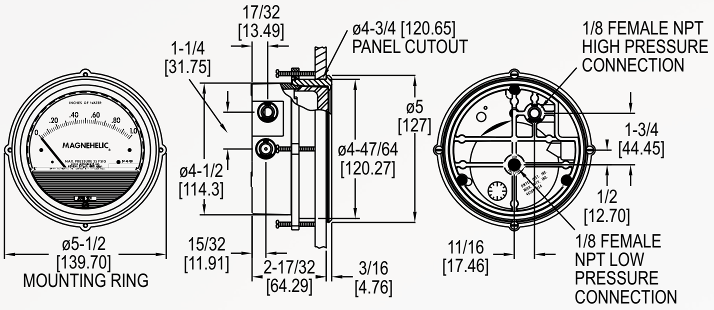
Select the **Series 2000 Magnehelic® Differential Pressure Gages** for a versatile low differential pressure gauge with a wide choice of 81 models and 27 options to choose from. Using Dwyer's simple, frictionless Magnehelic® gage movement, it quickly indicates air or noncorrosive gas pressures - either positive, negative (vacuum) or differential. The design resists shock, vibration, over-pressures and is weatherproof to IP67.

GAGE SPECIFICATIONS

Service	Air and non-combustible, compatible gases (natural gas option available). **Note:** May be used with hydrogen. Order a Buna-N diaphragm. Pressures must be less than 35 psi.
Wetted Materials	Consult factory.
Housing	Die cast aluminum case and bezel, with acrylic cover, exterior finish is coated gray to withstand 168 hour salt spray corrosion test.
Accuracy	±2% of FS (±3% on -0, -100 Pa, -125 PA, -10 mm and ±4% on -00, -60 Pa, -6 mm ranges), throughout range at 70°F (21.1°C).
Pressure Limits	20 in Hg to 15 psig (-0.677 bar to 1.034 bar); MP option; 35 psig (2.41 bar), HP option; 80 psig (5.52 bar).
Enclosure Rating	IP67.
Overpressure	Relief plug opens at approximately 25 psig (1.72 bar), standard gages only. See Overpressure Protection note on catalog page.
Temperature Limits	20 to 140°F (-6.67 to 60°C). -20°F (-28°C) with low temperature option.
Size	4″ (101.6 mm) diameter dial face.
Mounting Orientation	Diaphragm in vertical position. Consult factory for other position orientations.
Process Connections	1/8″ female NPT duplicate high and low pressure taps - one pair side and one pair back.
Weight	1 lb 2 oz (510 g); MP and HP 2 lb 2 oz (963 g).
Standard Accessories	Two 1/8″ NPT plugs for duplicate pressure taps, two 1/8″ pipe thread to rubber tubing adapters and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for three adapters in MP and HP gage accessories).
Compliance	Meets the technical requirements of EU Directive 2011/65/EU (RoHS II). **Note:** -SP models not RoHS approved.
Note: For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Options page.	

DIMENSIONS





HOW TO ORDER

Use the **bold** characters from the chart below to construct a product code.

2002 **-ASF**

SERIES

(in w.c./mm w.c.)
2000-00: 0-0.25 in w.c.
2000-00N: 0.5-0-0.2 in w.c.
2000-0: 0-0.5 in w.c.
2001: 0-1 in w.c.
2002: 0-2 in w.c.
2003: 0-3 in w.c.
2004: 0-4 in w.c.
2006: 0-6 in w.c.
2010: 0-10 in w.c.
2000-6MM: 0-6 mm w.c.
2000-50MM: 0-50 mm w.c.
2300-12MM: 6-0-6 mm w.c.

(Pa)
2000-60NPA: 10-0-50 Pa
2000-60PA: 0-60 Pa
2000-100PA: 0-100 Pa
2000-125PA: 0-125 Pa
2000-250PA: 0-250 Pa
2000-300PA: 0-300 Pa
2000-500PA: 0-500 Pa
2300-60PA: 30-0-30 Pa
2300-100PA: 50-0-50 Pa
2300-120PA: 60-0-60 Pa

(kPa)
2000-1KPA: 0-1 kPa
2000-1.5KPA: 0-1.5 kPa
2000-2KPA: 0-2 kPa
2000-3KPA: 0-3 kPa

OPTIONS

-ASF: Adjustable signal flag
-AHU1: Mounting plate
-AHU2: Mounting plate with A-481 accessory kit
-BUNA: Buna-N elastomers
-CB: Chrome bezel
-FC: Factory calibration
-HA: High accuracy
-M: Mirrored scale overlay
-SB: 304 SS bezel
-SS: Brushed 304 SS bezel

Note: Only our most popular models and options are listed. For additional available models, please visit:
https://www.dwyer-inst.com/Product/Pressure/DifferentialPressure/Gages/Series2000

ACCESSORIES

Model	Description
A-320-A	Enclosure for Series 2000 Magnehelic® gages, DM-2000 differential pressure transmitter, 4-9/16″ (115.89 mm)
A-464	Flush Mount kit for Magnehelic® gages
A-610	Pipe mounting kit for 1-1/4″ to 2″ pipe. 5.6″ x 4.6″ x 1.4″, 1.0 lb
A-300	Flat aluminum bracket for flush mounting Magnehelic® gage. 6.8″ x 6.0″ x .1″, .35 lb
A-299	Mounting bracket flush mount Magnehelic® gage in bracket. Bracket is then surface mounted. Steel with gray hammertone epoxy finish. 6.3″ x 7.7″ x 4.0″, 1.30 lb

ORDER ONLINE TODAY!

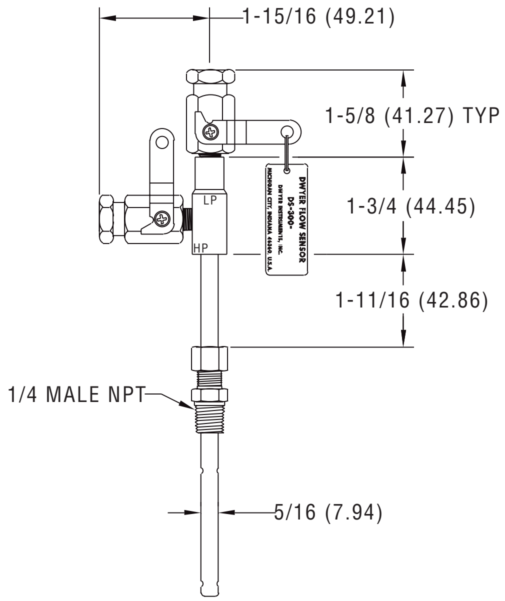
dwyer-inst.com

DWYER INSTRUMENTS, LLC

Printed in U.S.A. 11/22

Series DS-300 Flow Sensors

Installation and Operating Instructions Flow Calculations



Series DS-300 Flow Sensors are averaging pitot tubes that provide accurate, convenient flow rate sensing. When purchased with a Dwyer Capsuhelic® for liquid flow or Magnehelic® for air flow, differential pressure gage of appropriate range, the result is a flow-indicating system delivered off the shelf at an economical price. Series DS-300 Flow Sensors are designed to be inserted in the pipeline through a compression fitting and are furnished with instrument shut-off valves on both pressure connections. Valves are fitted with 1/8˝ female NPT connections. Accessories include adapters with 1/4˝ SAE 45° flared ends compatible with hoses supplied with the Model A-471 Portable Capsuhelic® kit. Standard valves are rated at 200°F (93.3°C). Where valves are not required, they can be omitted at reduced cost. Series DS-300 Flow Sensors are available for pipe sizes from 1˝ to 10˝.

INSPECTION

Inspect sensor upon receipt of shipment to be certain it is as ordered and not damaged. If damaged, contact carrier.

INSTALLATION

General - The sensing ports of the flow sensor must be correctly positioned for measurement accuracy. The instrument connections on the sensor indicate correct positioning. The side connection is for total or high pressure and should be pointed upstream. The top connection is for static or low pressure.

Location - The sensor should be installed in the flowing line with as much straight run of pipe upstream as possible. A rule of thumb is to allow 10 - 15 pipe diameters upstream and 5 downstream. The table below lists recommended up and down piping.

PRESSURE AND TEMPERATURE

Maximum: 200 psig (13.78 bar) at 200°F (93.3°C).

Upstream and Downstream Dimensions in Terms of Internal Diameter of Pipe*

Upstream Condition	Minimum Diameter of Straight Pipe		
	Upstream		Downstream
	In-Plane	Out of Plane	
One Elbow or Tee	7	9	5
Two 90° Bends in Same Plane	8	12	5
Two 90° Bends in Different Plane	18	24	5
Reducers or Expanders	8	8	5
All Valves**	24	24	5

* Values shown are recommended spacing, in terms of internal diameter for normal industrial metering requirements. For laboratory or high accuracy work, add 25% to values.

** Includes gate, globe, plug and other throttling valves that are only partially opened. If valve is to be fully open, use values for pipe size change. **CONTROL VALVES SHOULD BE LOCATED AFTER THE FLOW SENSOR.**

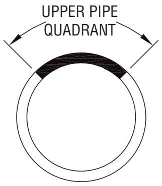
POSITION

Be certain there is sufficient clearance between the mounting position and other pipes, walls, structures, etc, so that the sensor can be inserted through the mounting unit once the mounting unit has been installed onto the pipe.

Flow sensors should be positioned to keep air out of the instrument connecting lines on liquid flows and condensate out of the lines on gas flows. The easiest way to assure this is to install the sensor into the pipe so that air will bleed into, or condensate will drain back to, the pipe.

For Air or Gas Flow

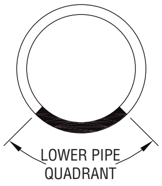
Install in upper quadrant of pipe



Condensate drains back to pipe

For Liquid or Steam Flow

Install in lower quadrant of pipe



Air bleeds back to pipe

INSTALLATION

1. When using an A-160 thred-o-let, weld it to the pipe wall. If replacing a DS-200 unit, an A-161 bushing (1/4˝ x 3/8˝) will be needed.

2. Drill through center of the thred-o-let into the pipe with a drill that is slightly larger than the flow sensor diameter.

3. Install the packing gland using proper pipe sealant. If the packing gland is disassembled, note that the tapered end of the ferrule goes into the fitting body.

4. Insert sensor until it bottoms against opposite wall of the pipe, then withdraw 1/16˝ to allow for thermal expansion.

5. Tighten packing gland nut finger tight. Then tighten nut with a wrench an additional 1-1/4 turns. Be sure to hold the sensor body with a second wrench to prevent the sensor from turning.

INSTRUMENT CONNECTION

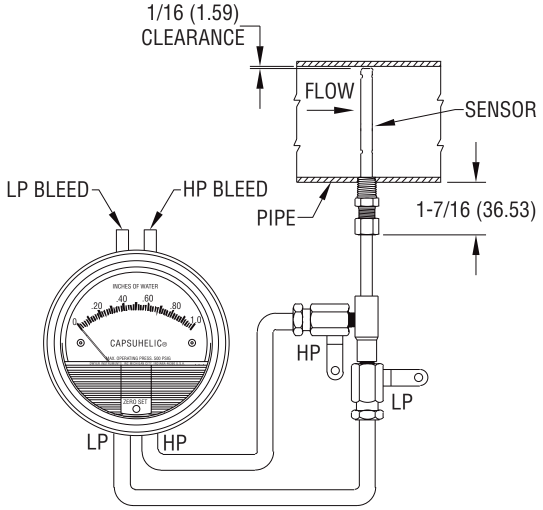
Connect the slide pressure tap to the high pressure port of the Magnehelic® (air only) or Capsuhelic® gage or transmitting instrument and the top connection to the low pressure port.

See the connection schematics below.

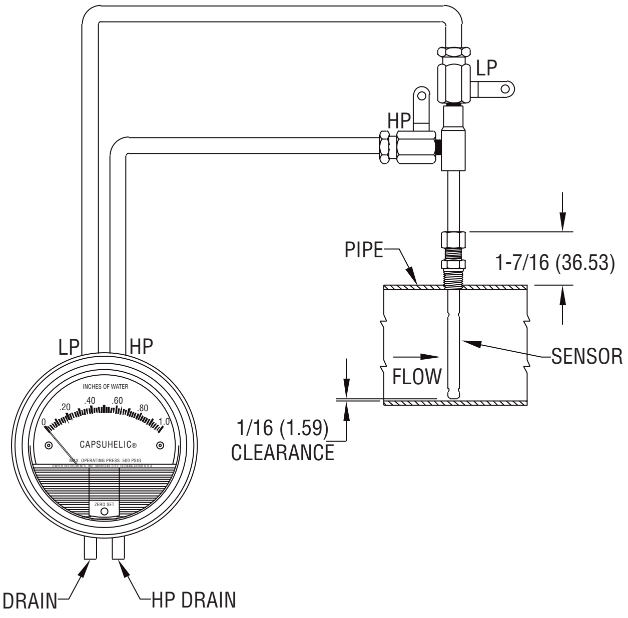
Bleed air from instrument piping on liquid flows. Drain any condensate from the instrument piping on air and gas flows.

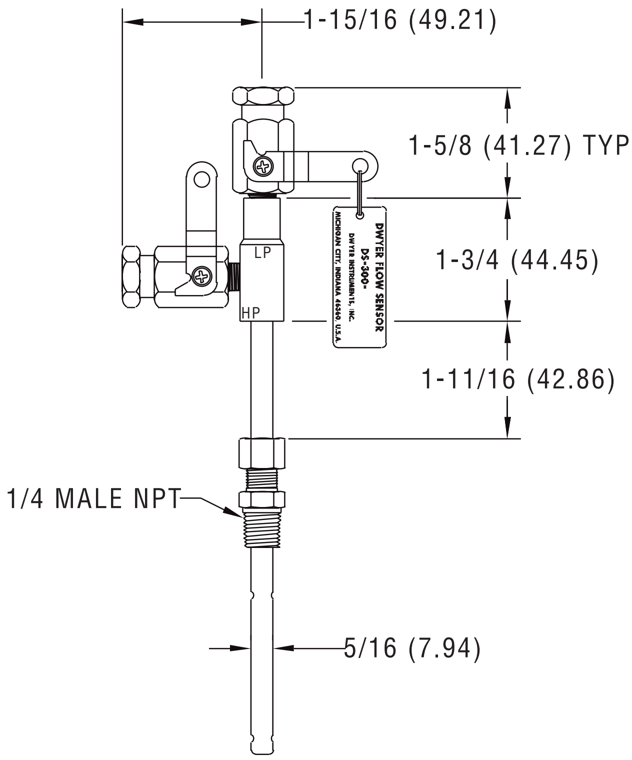
Open valves to instrument to place flow meter into service. For permanent installations, a 3-valve manifold is recommended to allow the gage to be zero checked without interrupting the flow. The Dwyer A-471 Portable Test Kit includes such a device.

Water Flow



Air or Gas Flow





Flow Calculations and Charts

The following information contains tables and equations for determining the differential pressure developed by the DS-300 Flow Sensor for various flow rates of water, steam, air or other gases in different pipe sizes.

This information can be used to prepare conversion charts to translate the differential pressure readings being sensed into the equivalent flow rate. When direct readout of flow is required, use this information to calculate the full flow differential pressure in order to specify the exact range of Dwyer Magnehelic® or Capsuhelic® gage required. Special ranges and calculations are available for these gages at minimal extra cost. See bulletins A-30 and F-41 for additional information on Magnehelic® and Capsuhelic® gages and DS-300 flow sensors.

For additional useful information on making flow calculations, the following service is recommended: Crane Valve Co. Technical Paper No. 410 “Flow of Fluids Through Valves, Fittings and Pipe.” It is available from Crane Valve Company, www.cranevalve.com.

Using the appropriate differential pressure equation from Page 4 of this bulletin,calculate the differential pressure generated by the sensor under normal operating conditions of the system. Check the chart below to determine if this value is within the recommended operating range for the sensor. Note that the data in this chart is limited to standard conditions of air at 60°F (15.6°C) and 14.7 psia static line pressure or water at 70°F (21.1°C). To determine recommended operating ranges of other gases, liquids an/or operating conditions, consult factory.

Note: the column on the right side of the chart which defines velocity ranges to avoid. Continuous operation within these ranges can result in damage to the flow sensor caused by excess vibration.

Pipe Size (Schedule 40)	Flow Coefficient “K”	Operating Ranges Air @ 60°F & 14.7 psia (D/P in. W.C.)	Operating Ranges Water @ 70°F (D/P in. W.C.)	Velocity Ranges Not Recommended (Feet per Second)
1	0.52	1.10 to 186	4.00 to 675	146 to 220
1-1/4	0.58	1.15 to 157	4.18 to 568	113 to 170
1-1/2	0.58	0.38 to 115	1.36 to 417	96 to 144
2	0.64	0.75 to 75	2.72 to 271	71 to 108
2-1/2	0.62	1.72 to 53	6.22 to 193	56 to 85
3	0.67	0.39 to 35	1.43 to 127	42 to 64
4	0.67	0.28 to 34	1.02 to 123	28 to 43
6	0.71	0.64 to 11	2.31 to 40	15 to 23
8	0.67	0.10 to 10	0.37 to 37	9.5 to 15
10	0.70	0.17 to 22	0.60 to 79	6.4 to 10

FLOW EQUATIONS

1. Any Liquid

$$Q\text{ (GPM)} = 5.668 \times K \times D^2 \times \sqrt{\Delta P/S_f}$$

2. Steam or Any Gas

$$Q\text{ (lb/Hr)} = 359.1 \times K \times D^2 \times \sqrt{p \times \Delta P}$$

3. Any Gas

$$Q\text{ (SCFM)} = 128.8 \times K \times D^2 \times \sqrt{\frac{P \times \Delta P}{(T + 460) \times S_s}}$$

DIFFERENTIAL PRESSURE EQUATIONS

1. Any Liquid

$$\Delta P\text{ (in. WC)} = \frac{Q^2 \times S_f}{K^2 \times D^4 \times 32.14}$$

2. Steam or Any Gas

$$\Delta P\text{ (in. WC)} = \frac{Q^2}{K^2 \times D^4 \times p \times 128{,}900}$$

3. Any Gas

$$\Delta P\text{ (in. WC)} = \frac{Q^2 \times S_s \times (T + 460)}{K^2 \times D^4 \times P \times 16{,}590}$$

Technical Notations

The following notations apply:

ΔP = Differential pressure expressed in inches of water column
Q = Flow expressed in GPM, SCFM, or PPH as shown in equation
K = Flow coefficient— See values tabulated on Pg. 3.
D = Inside diameter of line size expressed in inches.

For square or rectangular ducts, use: $D = \sqrt{\dfrac{4 \times \text{Height} \times \text{Width}}{\pi}}$

P = Static Line pressure (psia)
T = Temperature in degrees Fahrenheit (plus 460 = °Rankine)
p = Density of medium in pounds per square foot
S_f = Sp Gr at flowing conditions
S_s = Sp Gr at 60°F (15.6°C)

SCFM TO ACFM EQUATION

$$\text{SCFM} = \text{ACFM} \times \left(\frac{14.7 + \text{PSIG}}{14.7}\right) \left(\frac{520^*}{460 + {}^\circ\text{F}}\right)$$

$$\text{ACFM} = \text{SCFM} \times \left(\frac{14.7}{14.7 + \text{PSIG}}\right) \left(\frac{460 + {}^\circ\text{F}}{520}\right)$$

$$\begin{array}{c}\text{POUNDS PER}\\ \text{CUBIC FOOT}\end{array}\text{STD.} = \begin{array}{c}\text{POUNDS PER}\\ \text{CUBIC FOOT}\end{array}\text{ACT.} \times \left(\frac{14.7}{14.7 + \text{PSIG}}\right) \left(\frac{460 + {}^\circ\text{F}}{520^*}\right)$$

$$\begin{array}{c}\text{POUNDS PER}\\ \text{CUBIC FOOT}\end{array}\text{ACT.} = \begin{array}{c}\text{POUNDS PER}\\ \text{CUBIC FOOT}\end{array}\text{STD.} \times \left(\frac{14.7 + \text{PSIG}}{14.7}\right) \left(\frac{520^*}{460 + {}^\circ\text{F}}\right)$$

1 Cubic foot of air = 0.076 pounds per cubic foot at 60° F (15.6°C) and 14.7 psia.
* (520°= 460 + 60°) Std. Temp. Rankine

Printed in U.S.A. 7/04

FR# 72-440451-01 Rev. 2

KELE ALARM INDICATION STATION
AIS

DESCRIPTION

The **Kele Model AIS Alarm Indication Station** features an indication light, alarm horn and an alarm horn silence switch. Upon an alarm contact closure, the LED indicator will light and the horn will sound. The horn can be silenced through the alarm silence switch, while the visual indication will continue to be lighted until the alarm condition has been corrected.

SEQUENCE OF OPERATION

Upon an alarm contact closure, the LED indicator will light, and the horn will sound. The horn can be silenced through the alarm silence switch, while the visual indication will continue to be lighted until the alarm condition has been corrected. A power interruption or open alarm contact will reset the AIS.

FEATURES

- *Long lasting, red LED indication*
- *Distinct continuous audible tone*
- *Horn silence switch*
- *Compact and rugged design*
- *Available in 24 VDC, 24 VAC, or 120 VAC*
- *Bright yellow panel face*

APPLICATION

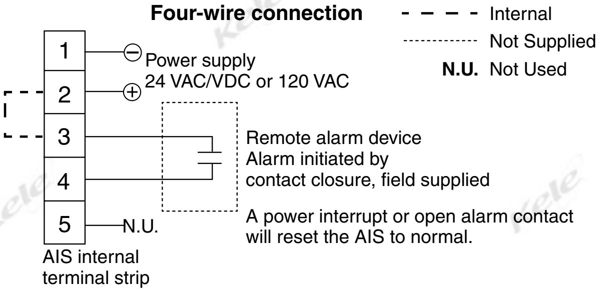
- *Refrigerant leak alarm indication*
- *Water level alarm indication*
- *Pressure alarm indication*
- *High/Low temperature limits*
- *Gas leak indication*
- *Humidity limit alarm indication*
- *Vibration limit*
- *Voltage/Current level limit*
- *Any contact closure alarm application*

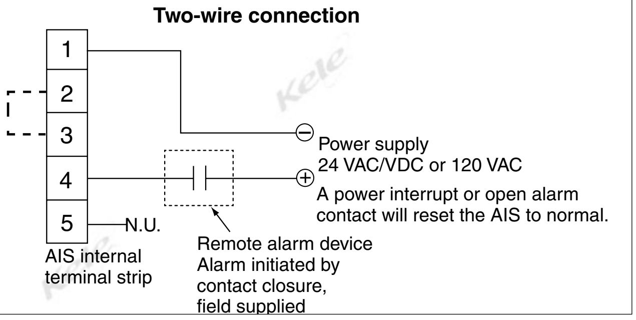
AIS Series

SPECIFICATIONS

Supply Voltage	24 VAC @ 2.4 VA, 24 VDC @ 100 mA max., 120 VAC
Relay Output	
AIS-24D	24 VDC, 50 mA min
AIS-24A	24 VAC, 90 mA min
AIS-120A	120 VAC, 70 mA min
Alarm Horn	80 db
Mounting	Four screws through back
Dimensions	7.09"H x 4.33"W x 4.52"D (18.0 x 11.0 x 11.47 cm)
Enclosure Rating	NEMA 4, Polystyrene, impact resistant, knock-outs
Weight	1.1 lb (0.5 Kg)
Approvals	RoHS
Warranty	1 year

WIRING





ORDERING INFORMATION

MODEL	DESCRIPTION	
AIS	Alarm indication station	
	12VD	12 VDC powered
	24D	24 VDC powered
	24A	24 VAC powered
	120A	120 VAC powered

AIS - **24A** ***Example:*** **AIS-24A** 24 VAC powered alarm indication station

DATASHEET

Engineered Panels

VFD

Main Features

Series	: EDP11
Product Code	: EDP11S007DN3R10000
Type	: Standard

Basic Data

Panel type	: VFD
Bypass type	: AC3
Enclosure type	: Wall mount
Enclosure rating	: Type 1
Thermal Managment	: Enclosure heater
OPCIONAIS_INVOLUCRO_PEWEC	:
Disconnect switch type	: Circuit Breaker rotary handle disconnect
Horsepower (HP)	: 2 HP
Main voltage	: 230 V
Control Voltage	: 120 V
Frequency	: 60 Hz
SCCR rating	: 5 kAIC
Control power transformer	: 100 VA - Open
Reactor/Filter	: None
Communication	: None
Control options	: Start Pushbutton, Stop Pushbutton, E-STOP Pushbutton, Run Light, Fault Light and Keypad

Dimensions

Nominal height	: 762.0 mm / 30.0 in
Nominal width	: 609.6 mm / 24.0 in
Nominal depth	: 203.2 mm / 8.0 in

Certifications

Certification	: UL/cUL

Notes

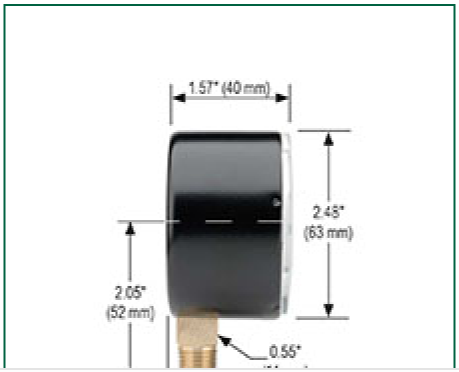
1) Image merely illustrative;

NOSHOK, INC.
1010 W. Bagley Road
Berea, OH 44017
Phone: 440.243.0888
Fax: 440.243.3472
Website: www.noshok.com

GAUGE 25-200-15

Part Number 25-200-15-inH2O-vac, 2-1/2" Black Steel Case, Copper Alloy Internals, 15 inH2O vac, 1/4" National Pipe Thread (NPT) Male Bottom Connection Vacuum Gauge

- Sensitive capsule-type non-fillable dry gauge
- Black painted Steel, Stainless Steel and impact-resistant ABS case
- Copper alloy and Brass wetted parts



Specifications | Temperature Ranges | Prop 65 Warnings | A
Limitations Which Apply Are | Caution | Options and Access

Specifications −

Chat now

Stock	Yes
Type	Low Pressure Gauge
Series	200
Connection Type	National Pipe Thread (NPT)
Full Scale Accuracy (±)	1.6 %
Connection Size	1/4 in
Lens/Display Material	Acrylic
Gauge Size	2-1/2 in
Connection Location	Bottom
Dial	Aluminum, white background with black scale. UV resistant.
Case Type	Steel, Bottom Connection
Pressure Range	-15 to 0 inH_2O
Case Material	Black Painted Steel
Connection Material	Brass
Pointer	Black Finished Aluminum
Movement	Brass and Nickel-Silver with Highly Polished Bearing Surfaces
Warranty	1 yr
Related Items	102-MFB, 1/4" National Pipe Thread (NPT), Male x Female, Brass, 0.172" Orifice Hard Seat Mini Valve 102-MFC, 1/4" National Pipe Thread (NPT), Male x Female, Steel, 0.172" Orifice Hard Seat Mini Valve 102-MFS, 1/4" National Pipe Thread (NPT), Male x Female, 316 Stainless Steel, 0.172" Orifice Hard Seat Mini Valve

	602-MFC, 1/4" National Pipe Thread (NPT), Male x Female, Steel, Hard Seat, 0.187" Orifice Block and Bleed Valve

Temperature Ranges

Media Temperature Range	-4 to 176 ºF -20 to 80 ºC
Ambient Temperature Range	-4 to 140 ºF -20 to 60 ºC

Prop 65 Warnings

Prop 65 Warnings	⚠ **WARNING:** This product can expose you to chemicals including Lead and Nickel, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Application

Application	• Filter monitoring • Gas distribution • HVAC • Leak detection • Level indication • Medical

Working Pressure Limitations

	Dynamic Pressure The working pressure should be limited to 60% of the dial range

Working Pressure Limitations

Static Pressure
The working pressure, where no sharp fluctuations occur, should be limited to 90% of the dial range

Limitations Which Apply Are

Limitations Which Apply Are

- Bourdon tube pressure gauges must be used within their calibrated maximum range to prevent damage
- The pressure gauges must be operated within the following working pressure limits:
  - Dynamic Pressure application, 60% of the dial range
  - Static Pressure applications, where no sharp fluctuations occur, 90% of the dial range
- The gauges must be operated within specified ambient temperature ranges
- Determination of gauge failures will be made by NOSHOK, Inc., which will use its equipment and personnel or a certified test facility specializing in this type of evaluation and determination. Gauge failures determined to be caused by over-range, incompatibility with environment or product media and abuse will not be considered under this warranty. NOSHOK, Inc. will, at its discretion, repair or replace the working parts of the damaged gauge without cost to the customer. This written warranty applies only to the NOSHOK gauges referenced in the first paragraph of this warranty, sold by NOSHOK, Inc. and its authorized distributors.

Caution

Operating conditions including, but not limited to, system pressure, media compatibility and ambient conditions must be considered when selecting gauges and accessories. Improper selections and use of gauges could possibly cause gauge failure and lead to possible property damage or personal

Caution	injury. Refer to the American National Standard ANSI B40.1 for the correct selection and use of gauges. A copy of this standard may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017. In keeping with and for purposes of product and/or manufacturing process improvements, NOSHOK, Inc. reserves the right to make design changes without prior notice.

Options and Accessories

−

Installed Options and Accessories

Available

- Stainless Steel Case (SSC)
- Glass Lens (GL) (A steel or stainless cover ring must be additionally ordered when lenses other than plexiglass are utilized on all 200 Series models)
- Safety Glass Lens (SG) (A steel or stainless cover ring must be additionally ordered when lenses other than plexiglass are utilized on all 200 Series models)
- Plexiglass Lens (PL)
- Recalibrator Lens (RL)
- Red Set Pointer (SP)
- Maximum Indicating Pointer (MIP)
- Black Rear Flange (BLRF)
- Black Cover Ring (BCR)
- Stainless Steel Cover Ring (SSCR)
- Rubber Case Protectors (RCP)
- 10-32-UNF-2B (10-32)
- Orifice - Brass Threaded 0.3mm (BT3) - Standard
- Laser Marking (LM)
- Stainless Steel Tagging (ST)

Certificates

- Certified Calibration (CC)

Uninstalled Options and Accessories	• Certificate of Cleaning (COCL) • Certificate of Conformance (COC)
Assembly Options	NOSHOK offers multiple assembly options to meet your specific system requirements. Consult factory to discuss your customized solution.
Diaphragm Seals	NOSHOK offers a wide variety of standard & elevated pressure, and reduced pressure replaceable and non-replaceable diaphragm seals, designed to isolate and/or protect the pressure measuring instrument from corrosive, viscous, contaminated or very high temperature process media.
Distribution Manifolds	NOSHOK's Distribution Manifolds connect multiple instruments to one diaphragm seal, eliminating multiple connections that lead to possible leak paths.
Metric Dials and Customized Special Dials	• Dual scale metric dials in psi/bar, psi/kPa and psi/kg/cm^2 • Other scales are available for specific sizes and ranges, such as single scale bar and kPa, refrigerant scales and altitude scales • Customized special dials such as non-standard metric scale, tons of ram, lbs. of force, etc. are available in small quantities (as few as one piece) on some NOSHOK gauges Please consult the factory for availability.
Pressure Snubbers - Piston Type	• Protect the instrument from the damaging effects of high temperature steam • Recommended for use in all steam applications • Available in 1/4" and 1/2" NPT sizes in welded steel, welded 316 Stainless Steel or seamless 316 Stainless Steel with ratings to 3800 psi at 850 ºF
	• Temperature ratings: 15,000 psi at 200 ºF and 3,000 psi at 1,000 ºF • Used with gauges and gauge valves to adjust

Pressure Snubbers - Sintered Type	the line of sight • Rotates 360º to allow the connected instrument to be positioned in the desired direction • The pressure connection is achieved with a tapered cone style compression fitting simply by tightening the swivel hex nut • All 316 Stainless Steel construction • Standard with 1/2" NPT male process - 1/2" NPT female instrument connections • Also available with 1/4" NPT connections, same specifications apply • Weight approximately 0.8 lb.
Steam Syphons	• Protect the instrument from the damaging effects of high temperature steam • Recommended for use in all steam applications • Available in 1/4" and 1/2" NPT sizes in welded steel, welded 316 Stainless Steel or seamless 316 Stainless Steel with ratings to 3800 psi at 850 ºF
Swivel Adapters	• Temperature ratings: 15,000 psi at 200 ºF and 3,000 psi at 1,000 ºF • Used with gauges and gauge valves to adjust the line of sight • Rotates 360º to allow the connected instrument to be positioned in the desired direction • The pressure connection is achieved with a tapered cone style compression fitting simply by tightening the swivel hex nut • All 316 Stainless Steel construction • Standard with 1/2" NPT male process - 1/2" NPT female instrument connections • Also available with 1/4" NPT connections, same specifications apply • Weight approximately 0.8 lb.

APPENDIX K

MITIGATION SYSTEM OPTIMIZATION TABLE OF CONTENTS

REMEDIAL SYSTEM OPTIMIZATION FOR 272 4TH AVENUE

TABLE OF CONTENTS

APPENDIX L

SUMMARY OF GREEN REMEDIATION METRICS

APPENDIX L
Summary of Green Remediation Metrics for Site Management

Site Name: 272 4th Ave Site Code: C224298
Address: 272 4th Avenue City: Brooklyn
State: NY Zip Code: 11215 County: Kings

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: ____________________

Current Reporting Period
Reporting Period From: ______________________ To: __________________________

Contact Information
Preparer's Name: ___________________________ Phone No.: ____________________
Preparer's Affiliation: ___________________________________

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CONTRACTOR CERTIFICATION
I, ___________________________ (**Name**) do hereby certify that I am ______________________ (**Title**) of __________________ (**Contractor Name**), which is responsible for the work documented on this form. According to my knowledge and belief, all of the information provided in this form is accurate and the site management program complies with the DER-10, DER-31, and CP-49 policies. ____ **Date** **Contractor**

APPENDIX M
REQUEST TO IMPORT/REUSE FILL MATERIAL FORM

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e). Use of this form is not a substitute for reading the applicable Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that would pass a size 80 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

Revised August 2014

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

___________________________________ ________________
Signature Date

____
Print Name

____
Firm

Revised August 2014