11-20 46TH ROAD SITE

QUEENS COUNTY

LONG ISLAND CITY, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: C241242

Prepared for:

11-20 46th Road Owner LLC

10 East 34th Street, Mezzanine

New York, New York 10016

Prepared by:

Roux Environmental Engineering and Geology, D.P.C.

209 Shafter Street

Islandia, New York 11749

631-232-2600

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

DECEMBER 2021

CERTIFICATION STATEMENT

I, David Kaiser, certify that I am currently a NYS registered professional engineer as in defined in 6 NYCRR Part 375 and that this Site Management Plan 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).

_____ P.E.

December 21, 2021 DATE

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

List of Tables

List of Figures

List of Plates

List of Appendices

List of Acronyms

AWQSGV	Ambient Water Quality Standard and Guidance Value
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BCS	Below cellar slab
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
CP	Commissioner Policy
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ESA	Environmental Site Assessment
EWP	Excavation Work Plan
HASP	Health and Safety Plan
IC	Institutional Control
IRM	Interim Remedial Measure
IRMWP	Interim Remedial Measure Work Plan
MG/KG	Milligrams Per Kilogram
MCL	Maximum Contaminant Level
MSL	Mean Sea Level
NG/L	Nanograms Per Liter
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYC Health	New York City Department of Health & Mental Hygiene
NYCRR	New York Codes, Rules and Regulations
OM&M	Operation, Maintenance and Monitoring
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
P.E. or PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonic Acid
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RA	Remedial Action
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
REC	Recognized Environmental Condition
RI	Remedial Investigation
RP	Remedial Party
RSO	Remedial System Optimization
SCG	Standards, Criteria and Guidance

SCO	Soil Cleanup Objective
SMP	Site Management Plan
SSDS	Sub-slab Depressurization System
SVI	Soil Vapor Intrusion
SVOC	Semivolatile Organic Compound
USEPA	United States Environmental Protection Agency
UG/KG	Micrograms Per Kilogram
UG/L	Micrograms Per Liter
UG/M^3	Micrograms Per Cubic Meter
VOC	Volatile Organic Compound
VI	Vapor Intrusion

ES EXECUTIVE SUMMARY

This Site Management Plan (SMP) is a required element of the remedial program for the property located at 11-20 46th Road, located in Long Island City, Queens County, New York (hereinafter referred to as the "Site"). The Site is in the New York State Brownfield Cleanup Program (BCP), which is administered by the New York State Department of Environmental Conservation (NYSDEC) and was assigned BCP Site No. C241242. 11-20 46th Road Owner LLC entered into a Brownfield Cleanup Agreement (BCA) Index No. C241242-05-20 on June 15, 2020 with the NYSDEC to investigate and remediate the Site.

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 SMP:

Site Identification:	BCP Site No. C241242 11-20 46th Road Long Island City, Queens 11101
Institutional Controls:	1. The property may be used for restricted residential, commercial, and/or industrial use.
	2. Compliance with Environmental Easement.
	3. All engineering controls (ECs) must be operated and maintained as specified in this SMP.
	4. All ECs must be inspected at a frequency and in a manner defined in this SMP.
	5. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or NYC Health 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.
	6. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP.
	7. Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP.

Site Identification:	BCP Site No. C241242 11-20 46th Road Long Island City, Queens 11101

	8. Require the Remedial Party (RP) or Site owner to complete and submit to the NYSDEC a periodic certification of institutional controls (ICs) and ECs in accordance with Part 375-1.8(h)(3).
	9. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
	10. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP.
	11. Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP.
	12. 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:	1. Cover system
	2. Sub-slab Depressurization System (SSDS)

Inspections:	Frequency
1. Site-Wide	Annually
2. Cover inspection	Annually
3. SSDS	Semi-Annually
Monitoring	
1. Indoor Air Sampling at IA-1, IA-2, IA-4, IA-5, IA-6, IA-9, IA-F1C, IA-F2C, and IA-F3C	Semi-Annually
Reporting:	
1. Periodic Review Report (PRR)	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this SMP.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the property located at 11-20 46th Road (Tax Block 56, Lot 36) in the Long Island City section of the Borough of Queens in the City and State of New York (hereinafter referred to as the "Site"). A Site location map is provided as Figure 1. The Site is currently in the New York State Brownfield Cleanup Program (BCP), which is administered by the New York State Department of Environmental Conservation (NYSDEC) and was assigned Site No. C241242.

11-20 46th Road Owner LLC (Site Owner and Remedial Party [RP]) entered into a Brownfield Cleanup Agreement (BCA) on June 15, 2020 with NYSDEC to investigate and remediate the Site. A figure showing the Site location and boundaries of this Site is provided in 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 described in the June 9, 2020 Interim Remedial Measures Work Plan (IRMWP), some contamination in soil, groundwater, and soil vapor was left at this Site, which is hereafter referred to as "remaining contamination." Institutional Controls (ICs) and Engineering Controls (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 and recorded with the New York City (NYC) Office of the City Register (County Recording Identifier No. 2021000417793), 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.

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). Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6 New York Codes, Rules and Regulations (NYCRR) Part 375 and the BCA (Index # C241242-05-20, Site # C241242) 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 Section 1.3 and in Appendix B of this SMP.

This SMP was prepared by Roux Environmental Engineering and Geology, D.P.C. on behalf of 11-20 46th Road Owner LLC, in accordance with the requirements of the NYSDEC's Division of Environmental Remediation (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 ECs that are required by the Environmental Easement for the Site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring:

- a change in media monitoring requirements;
- upgrades to or shutdown of a remedial system; and/or
- post-remedial removal of contaminated sediment or soil, or other significant change to the Site conditions.

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 Environmental Conservation Law.
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 EC 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/RP has been provided with a copy of the BCA, and all approved work plans and reports, including this SMP.
9. Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 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

Table 1: Notifications*

Name	Contact Information	Required Notification**
Christopher Allan, NYSDEC Project Manager	718-482-4065 christopher.allan@dec.ny.gov	All Notifications
Mandy Yau, NYSDEC Project Manager's Supervisor	718-482-4897 mandy.yau@dec.ny.gov	All Notifications
Jane O'Connell, NYSDEC Regional HW Engineer	718-482-4599 jane.oconnell@dec.ny.gov	All Notifications
Kelly Lewandowski, NYSDEC Site Control	518-402-4569 kelly.lewandowski@dec.ny.gov	Notifications 1 and 8
Gregory Rys, NYSDOH Project Manager	gregory.rys@health.ny.gov	Notifications 4, 6, and 7
Scarlett McLaughlin, NYSDOH Project Manager's Supervisor	scarlett.mclaughlin@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 Queens County, New York and is identified as Block 56, Lot 36 on the New York City and Borough of the Queens Tax Maps (see Figure 2). The Site is 0.229-acres and is bounded by 11th Street and 46th Road to the northwest, 11th Street and 47th Avenue to the southwest, Jackson Avenue and 21st Street and 47th Avenue to the southeast, and 21st Street and 46th Road to the northeast. The boundaries of the Site are more fully described in Appendix A–Environmental Easement. The owner of the Site parcel at the time of issuance of this SMP is 11-20 46th Road Owner LLC.

2.2 Physical Setting

2.2.1 Land Use

According to available sources, the Site was originally developed as a two-story building, with one of the stories being a partial cellar, in approximately 1957. In 2015, the Site was acquired by 11-20 46th Road Owner LLC and redeveloped into its current state and to be suitable for its intended future use. The redevelopment included the completion of a full subgrade cellar and the construction of two additional upper levels above grade. These construction activities occurred prior to the discovery of soil vapor contamination at the Site, which occurred during a Phase II investigation required by a lender. The building is currently occupied by the TheraCare of New York, Inc. (Tenant) who operates the Site as an office and as an educational facility for children with special needs. The Tenant moved into the facility after the installation of a sub-slab depressurization system (SSDS), which was fully functional and tested before occupancy. Redevelopment at the Site is compatible with the current zoning laws. The properties adjoining the Site and, in the neighborhood surrounding the Site, primarily include commercial, manufacturing, and residential properties.

2.2.2 Geology

Soils at the site consist of loose fine to coarse sand mixed with varying amounts of silt, gravel, brick, concrete and cobbles. Native soil consists of stratified sand, silt and clay.

Bedrock is assumed to be located between 12 and 28 feet below grade. The geologic formation of the site is Raritan Formation/Upper Cretaceous. The hydrology consists of Upper Glacial Aquifer followed by the Magothy Aquifer. The Upper Glacial Aquifer is an unconfined aquifer directly underlying the ground surface and comprised of poorly sorted glacial till (sand, pebbles, rock, boulders). Bedrock was not encountered during the RI due to the shallow nature of the soil borings. Site-specific boring logs are provided in Appendix C.

2.2.3 Hydrogeology

According to water-level data collected during the December 11, 2019 sampling event, the elevation of the water table surface at the Site ranged from approximately 3.80 ft relative to mean sea level (msl) at the northwest portion of the Site to approximately 4.75 relative to msl in the southeast portion of the Site. Groundwater depth at the Site varied from 0.60 ft below slab to 4.50 ft below slab. These measurements were taken beneath the newly constructed slab. The previous slab was approximately two feet above the newly constructed slab.

According to water-level data collected during the March 18, 2020 sampling event, the elevation of the water table surface at the Site ranged from approximately 2.56 ft relative to msl at the southeast portion of the Site to approximately 4.03 relative to msl in the northeast portion of the Site. Groundwater depth at the Site varied from 0.60 ft below slab to 3.62 ft below slab.

According to water-level data collected during the May 5, 2020 sampling event, the elevation of the water table surface at the Site ranged from approximately 3.27 ft relative to msl at the southeast portion of the Site to approximately 4.11 relative to msl in the northeast portion of the Site. Groundwater depth at the Site varied from 0.65 ft below slab to 2.88 ft below slab. No samples were collected for geotechnical analysis (grain size or soil permeability) as part of the Remedial Investigation (RI).

- Groundwater gauging data is included as Table 2, and groundwater flow maps are included as Figures 3A and 3B. The regional groundwater flow was generally to the west towards the East River during the December 11, 2019 sampling event. During both 2020 sampling events, the regional groundwater flow was generally to the south towards Newtown Creek. Groundwater monitoring well construction logs are provided in Appendix C.

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. The following environmental investigations have been performed at the Site and are discussed in detail in the sections below.

- Phase I Environmental Site Assessment, prepared by HydroTech, dated August 19, 2015.
- Phase I Environmental Site Assessment, prepared by Nova Consulting, dated July 18, 2019.
- Interim Remedial Measures Work Plan, prepared by Roux, dated June 9, 2020.
- Construction Completion Report, prepared by Roux, dated July 2, 2021.
- Remedial Investigation Report, prepared by Roux, dated September 9, 2021.

2.3.1 Phase I Environmental Site Assessment – HydroTech, August 2015

In 2015, HydroTech Environmental (HydroTech) prepared a Phase I Environmental Site Assessment (ESA) (2015 HydroTech Phase I ESA) for the Site for the benefit of the RP, and the Site was then subsequently acquired by the RP 11-20 46th Road Owner LLC. HydroTech concluded that the historical and current use of the Site as a manufacturer should be considered a recognized environmental condition (REC), but also concluded that no other historical uses or occupants identified in the database should have an impact upon the Subject Property and did not recommend a Phase II investigation. In reliance upon this Phase I, 11-20 46th Road Owner LLC acquired the Site. Following Site acquisition, 11-20 46th Road Owner LLC began the renovation process to convert the pre-existing building into its current state and to be suitable for its intended future use. The redevelopment included the completion of a full subgrade cellar and the construction of two upper levels above grade.

2.3.2 Phase I Environmental Site Assessment – Nova Consulting, July 2019

In 2019, another Phase I ESA was prepared by Nova Consulting (Nova) (2019 Nova Phase I ESA) as 11-20 46th Road Owner LLC applied for additional financing to complete the redevelopment at the Site. Nova's Phase I report concluded that the potential for vapor intrusion (VI) should be investigated prior to the planned use of the building. To

investigate the soil vapor REC identified in the 2019 Nova Phase I ESA, Roux performed indoor air sampling within the cellar space on August 23, 2019. A subsequent vapor VI investigation, which included sub-slab vapor sample collection beneath the cellar slab, indoor air sample collection within the cellar space and the collection of two soil and groundwater samples, was performed on September 26, 2019. The results of the preliminary VI investigation indicated that a VI pathway was potentially present based on the sub-slab samples. 11-20 46th Road Owner LLC took a number of subsequent actions and investigative activities to proactively characterize the Site conditions to determine if the source of the vapors was on the Site, and to otherwise mitigate the risks posed by the potential for VI at the Site regardless of whether the source was on-Site or not, which ultimately resulted in the 11-20 46th Road Owner LLC signing the BCA and agreeing to investigate and remediate the Site under the NYSDEC BCP.

2.3.3 IRM Work Plan

The IRM Work Plan details the scope of work for the installation of an active SSDS beneath portions of the existing Site building. The SSDS proposed in the IRMWP was installed to address potential soil vapor intrusion documented to be present in soil vapor beneath portions of the on-Site building that exceed NYSDOH's 2006 (as revised in 2017) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH Guidance) decision matrices for mitigation. No onsite source area of chlorinated solvents had been identified but the IRM was required immediately due to the Site intended use. The scope implemented as part of the IRM is summarized in the following Section 2.3.4.

2.3.4 Construction Completion Report – Roux, July 2021

The Construction Completion Report describes and documents the interim remedial measures implemented in accordance with the June 9, 2020 IRMWP that was approved on June 10, 2020. The following interim remedial measures were implemented from June 10, 2020 to May 25, 2021, on behalf of the 11-20 46th Road Owner LLC, which included the following Site remediation and redevelopment scopes of work prior to Remedial Action Work Plan (RAWP) approval:

- Installation of the below-grade SSDS components, including suction pits, perforated piping, riser pipes, a blower and monitoring points.

- Repair of the composite cover system consisting of a new 8-inch-thick concrete slab.

A figure showing the SSDS plan and details is provided as Plate 1. The implemented interim remedial actions are described and documented in the NYSDEC-approved July 2021 CCR.

2.3.5 Remedial Investigation Report – Roux, September 2021

This Remedial Investigation Report is comprised of the results of subsurface and indoor air testing conducted between August 2019 and April 2021. The findings are as follows:

1. Geology: Soils at the Site consist of loose fine to coarse sand mixed with varying amounts of silt, gravel, brick, concrete and cobbles. Native soil consists of stratified sand, silt, and clay. Bedrock is assumed to be located between 12 and 28 feet below grade. The geologic formation beneath the Site is the Raritan Formation/Upper Cretaceous. The hydrology consists of the Upper Glacial Aquifer followed by the Magothy Aquifer. The Upper Glacial Aquifer is an unconfined aquifer directly underlying the ground surface and comprised of poorly sorted glacial till (sand, pebbles, rock, boulders). Bedrock was not encountered during the RI due to the shallow nature of the soil borings.
2. Hydrogeology: According to water-level data collected during the December 11, 2019 sampling event, the elevation of the water table surface at the Site ranged from approximately 3.80 feet relative to msl at the northwest portion of the Site to approximately 4.75 feet relative to msl in the southeast portion of the Site. Groundwater depth at the Site varied from 0.60 feet below cellar slab (bcs) to 4.50 feet bcs. According to water-level data collected during the May 5, 2020 sampling event, the elevation of the water table surface at the Site ranged from approximately 3.27 feet relative to mean sea level at the southeast portion of the Site to approximately 4.11 feet relative to msl in the northeast portion of the Site. Groundwater depth at the Site varied from 0.65 feet below bcs to 2.88 feet bcs.
3. The regional groundwater flow was generally to the west towards the East River in the December 11, 2019 sampling. During the May 5, 2020 sampling, the regional groundwater flow was generally to the south towards Newtown Creek.
4. Historic Fill Material/Soil: Four volatile organic compounds (VOCs) were found to be in exceedance of the Unrestricted Use Soil Cleanup Objectives (SCOs) including acetone, naphthalene, n-propylbenezene, and total xylenes under the building slab. Acetone is attributed to laboratory-contamination, and the other three petroleum compounds are associated with the former spill that occurred on the Site and has been closed by NYSDEC. There were no VOC detections above NYSDEC Restricted Residential Use SCOs at the Site.
5. Semivolatile organic compounds (SVOCs), primarily polycyclic aromatic hydrocarbons (PAHs), were detected at elevated concentrations above NYSDEC Unrestricted Use SCOs and Restricted Residential Use SCOs under the building slab, which is common in New York City. Metals were detected in subsurface soil

at elevated concentrations above NYSDEC Unrestricted Use and Restricted Residential Use SCOs under the building slab. Metals contamination is related to urban fill soils, which are common in New York City. Pesticides, and herbicides were detected sporadically throughout Site soils. Pesticides and herbicides were detected in soil at concentrations exceeding NYSDEC Unrestricted Use SCOs, but they were not detected in exceedance of the NYSDEC Restricted Residential Use SCOs. There were no polychlorinated biphenyls (PCBs) found in exceedance of the NYSDEC Unrestricted Use or Restricted Residential Use SCOs

6. Groundwater: Low-level concentrations of two VOCs (naphthalene and n-propylbenzene) associated with the historical spill at the Site that was previously closed by NYSDEC were found in soils at concentrations about their NYSDEC Protection of Groundwater SCOs and in groundwater above their respective Ambient Water Quality Standards and Guidance Values (AWQSGVs). PAHs were identified as a source of contamination to groundwater, but this is attributed to historic fill under the building that is common in urban fill soils and is not historical Site-related operations.
7. Soil Vapor: VOCs were detected at elevated concentrations in Site-wide soil vapor. Although no VI pathway was identified, the potential for VI is currently being addressed at the Site through the operation of an active sub-slab depressurization system (SSDS), which was installed as part of the NYSDEC-approved IRMWP. Construction details and monitoring data were all be submitted to NYSDEC as part of a CCR. Future monitoring will be included as part of the FER.
8. Sufficient analytical data were gathered during the Remedial Investigation (RI) to develop the RAWP and the previously implemented IRMWP.

2.3.6 Remedial Action Work Plan – Roux, December 2021

The draft Remedial Action Work Plan analyzed two alternatives. The first alternative analyzed was a Track 1 unrestricted use cleanup; the second alterative was a Track 4 restricted residential (No Further Action) alternative. Both alternatives proposed were subsequent to the completion of the remedial measures described in the NYSDEC-approved IRMWP and Construction Completion Report and the renovation of the on-Site building. The Track 4 restricted residential (No Further Action) was the preferred alternative because no source of the VOC vapors was ever found to exist on this Site and the Track 1 remedy would have required a destruction of the building on the Site without any significant environmental benefit.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated December 21, 2021 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.

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.

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 a site.

2.5 Remaining Contamination

2.5.1 Soil

The Site achieved a Track 4 Restricted Residential Use cleanup through the implementation of ECs (i.e., Site Cover System and SSDS). All remaining contamination at the Site is located under the building's foundation slab and vapor barrier, a minimum of 24-inches of gravel, or a minimum of 3-inches of new asphalt underlain by 4-inches of existing asphalt/sub-base.

As no soil excavation was performed to remove soil, the results of the RI accurately demonstrate the remaining exceedances of the Track 1 soil cleanup objectives (i.e., existing contamination on-Site). Tables 3 through 8 and Figure 4 summarize the results of all soil

samples collected that exceed the Unrestricted Use SCOs or Restricted Residential SCOs at the Site after completion of the remedial action (RA).

A summary of the soil quality remaining at the Site is provided in the sections below:

VOCs

There were no VOC soil exceedances of Restricted Residential SCOs in the 38 soil samples collected at the Site. Only three VOCs were detected at concentrations above NYSDEC Protection of Groundwater SCOs in soil and also were detected in groundwater above AWQSGVs, but which are not the sources of the chlorinated solvent contamination in soil vapor identified, as discussed below:

- Acetone was detected at concentrations exceeding its NYSDEC Protection of Groundwater SCO (0.05 mg/kg) in ten soil samples, ranging in concentration from 0.068 milligrams per kilogram (mg/kg) to 9.4 mg/kg, with the maximum detection in soil sample SB-9_2-4. Acetone was not detected in any groundwater samples at concentrations above its AWQSGV.
- Naphthalene was detected at concentrations exceeding its NSYDEC Protection of Groundwater (12 mg/kg) in one soil sample, with a concentration of 33 mg/kg in SB-4_3-5. Naphthalene was detected at concentrations exceeding its NYSDEC AWQSGV in two samples (both from the temporary well TW-8), with a concentration of 290 µg/L in monitoring well TW-8 on December 10, 2019.
- N-Propylbenzene was detected at concentrations exceeding its NYSDEC Protection of Groundwater SCO (3.9 mg/kg) in one soil sample, with a concentration of 7.3 mg/kg in soil sample SB-18_4-6. N-Propylbenzene was detected at a concentration exceeding its NYSDEC AWQSGV in one sample, with a concentration of 8 µg/L in monitoring well TW-15 on March 18, 2020.

SVOCs

A summary of the SVOC soil exceedances of NYSDEC Protection of Groundwater SCOs and Restricted Residential SCOs in the 12 soil samples analyzed is provided below:

SVOC Exceedances of SCOs in Soil

Analyte	NYSDEC Restricted Residential Use SCOs (mg/kg)	Detections above NYSDEC Restricted Residential Use SCOs	Range in Concentration Above NYSDEC SCOs (mg/kg)	Soil Sample with Maximum Detection
Benzo[a]anthracene	1	6	1.1 – 10	SB-18_4-6
Benzo[a]pyrene	1	6	1.2 J – 18	SB-18_4-6
Benzo[b]fluoranthene	1	6	1.2 – 17	SB-18_4-6
Benzo[k]fluoranthene	3.9	1	1.1 – 5.1	SB-18_4-6
Chrysene	3.9	1	1.1 – 9.5	SB-18_4-6
Dibenzo[a,h]anthracene	0.33	3	0.35 – 2.9	SB-18_4-6
Indeno[1,2,3-cd]pyrene	0.5	6	0.73 J – 12	SB-18_4-6

SVOCs were detected at concentrations above NYSDEC Protection of Groundwater SCOs in soil at four soil sample locations. As all groundwater samples were collected from temporary monitoring wells, it is likely that SVOCs present in the unfiltered groundwater samples were a result of sediment present in the samples, as all of these SVOCs are commonly found in historic fill material and are not representative of dissolved impacts in groundwater.

- Benzo(a)anthracene was detected at concentrations exceeding its NYSDEC Protection of Groundwater SCO (1 mg/kg) in six soil samples, ranging in concentration from 1.1 mg/kg to 10 mg/kg, with the maximum detection in soil sample SB-18_4-6. Benzo(a)anthracene was detected in nine groundwater samples at concentrations exceeding its NYSDEC AWQSGV.
- Benzo(b)fluoranthene was detected at concentrations exceeding its NYSDEC Protection of Groundwater SCO (1.7 mg/kg) in four soil samples, ranging in concentration from 2.2 mg/kg to 17 mg/kg, with the maximum detection in soil sample SB-18_4-6. Benzo(b)fluoranthene was detected in nine groundwater samples at concentrations exceeding its NYSDEC AWQSGV.
- Benzo(k)fluoranthene was detected at concentrations exceeding its NYSDEC Protection of Groundwater SCO (1.7 mg/kg) in one soil sample at a concentration of 5.1 mg/kg (SB-18_4-6). Benzo(b)fluoranthene was detected in nine groundwater samples at concentrations exceeding its NYSDEC AWQSGVs.
- Chrysene was detected at concentrations exceeding its NYSDEC Protection of Groundwater SCO (1 mg/kg) in six soil samples, ranging in concentration from 1.1 mg/kg to 9.5 mg/kg, with the maximum detection in soil sample SB-18_4-6. Chrysene was detected in nine groundwater samples exceeding its NYSDEC AWQSGV.
- Indeno(1,2,3-C,D)Pyrene was detected at concentrations exceeding its NYSDEC Protection of Groundwater SCO (8.2 mg/kg) in one soil sample at a concentration of 12 mg/kg (SB-18_4-6). Indeno(1,2,3-C,D)Pyrene was detected in nine groundwater samples exceeding its NYSDEC AWQSGV.

Metals

A summary of the metals soil exceedances of NYSDEC Protection of Groundwater SCOs and Restricted Residential SCOs in the 12 soil samples analyzed is provided below:

Metal Exceedances of SCOs in Soil

Analyte	NYSDEC Restricted Residential Use SCOs (mg/kg)	Detections above NYSDEC Restricted Residential Use SCOs	Range in Concentration Above NYSDEC SCOs (mg/kg)	Soil Sample with Maximum Detection
Arsenic	16	2	21.3 – 25.7	SB-19_4-6
Cadmium	4.3	1	2.78 – 10.9	SB-20_4-6
Copper	270	2	82.8 – 880	SB-15_0-2
Lead	400	4	216 – 2780	SB-20_4-6
Nickel	310	2	59.1 – 110	SB-15_0-2

Metals were detected at concentrations above NYSDEC Protection of Groundwater SCOs in soil at five soil sample locations.

- Arsenic was detected at a concentration exceeding its NYSDEC Protection of Groundwater SCO (16 mg/kg) in two soil samples, ranging in concentration from 21.3 mg/kg to 25.7 mg/kg, with the maximum concentration in soil sample SB-20_4-6. Arsenic was detected at a concentration above its AWQSGV in one dissolved groundwater sample.
- Cadmium was detected at a concentration exceeding its NYSDEC Protection of Groundwater SCO (7.5 mg/kg) in one soil sample, SB-20_4-6 (10.9 mg/kg). Cadmium was not detected any dissolved groundwater samples at concentrations exceeding its NYSDEC AWQSGVs.
- Lead was detected at a concentration exceeding its NYSDEC Protection of Groundwater SCO (450 mg/kg) in four soil samples, ranging in concentration from 461 mg/kg to 2780 mg/kg, with the maximum concentration at SB-20_4-6 (2780 mg/kg). Lead was not detected any dissolved groundwater samples at concentrations exceeding its NYSDEC AWQSGVs.
- Zinc was detected at a concentration exceeding its NYSDEC Protection of Groundwater SCO (2,480 mg/kg) in three soil samples, ranging in concentration from 3,360 mg/kg to 9,440 mg/kg, with the maximum concentration at SB-20_4-6 (9440 mg/kg). Zinc was not detected any dissolved groundwater samples at concentrations exceeding its NYSDEC AWQSGVs.

PCBs

PCBs were not detected at concentrations exceeding NYSDEC Protection of Groundwater SCOs or Restricted Residential SCOs in any soil samples.

Pesticides and Herbicides

Pesticides and herbicides were not detected at concentrations exceeding NYSDEC Protection of Groundwater SCOs or Restricted Residential SCOs in any soil samples.

PFAS

A summary of the PFAS detections in the soil samples analyzed is provided below (J denotes an estimated concentration). Currently, there are no SCOs for PFAS compounds.

PFAS Detections in Soil

Analyte	NYSDEC Restricted Residential Use SCOs (µg/kg)	Detections above NYSDEC Restricted Residential Use SCOs	Number of Detections	Range in Concentrations (µg/kg)	Soil Sample with Maximum Detection
N-Ethyl-N-(heptadecafluorooctyl) sulphonyl) glycine	--	0	2	0.167 J – 0.448 J	SB-19_0-2
Perfluorobutanoic Acid	--	0	5	0.030 J – 0.051 J	SB-20_0-2
Perfluorodecane Sulfonic Acid	--	0	5	0.442 J – 1.04 J	SB-19_0-2
Perfluorodecanoic acid (PFDA)	--	0	1	0.072 J	SB-20_0-2
Perfluorododecanoic acid (PFDoA)	--	0	1	0.075 J	SB-20_0-2
Perfluoroheptanoic acid (PFHpA)	--	0	1	0.056 J	SB-19_0-2
Perfluorohexanoic acid (PFHxA)	--	0	5	0.061 J – 0.136 J	SB-20_0-2 DUP
Perfluorooctanesulfonic acid (PFOS)	33	0	7	0.154 J – 0.412 J	SB-15_5-7
Perfluorooctanoic acid (PFOA)	44	0	7	0.058 J – 0.134 J	SB-20_4-6
Perfluoropentanoic Acid (PFPeA)	--	0	4	0.053 J – 0.071 J	SB-15_0-2
Perfluorotetradecanoic acid (PFTA)	--	0	1	0.068 J	SB-20_0-2
Perfluoroundecanoic Acid (PFUnA)	--	0	2	0.054 J – 0.069 J	SB-20_0-2
TOTAL PFOA AND PFOS	--	**0**	**9**	**0.058 J – 0.525 J**	**SB-20_0-2**

Until SCOs are in effect, 33 µg/kg for PFOA and 44 µg/kg for PFOS are to be used as Restricted Residential soil guidance values. There were not any exceedances of either of these guidance values in the soil samples collected at the Site.

Tables 3 through 8 show exceedances from Track 1 Unrestricted SCOs for all soil/fill at the Site. Figure 4 is a spider map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill.

2.5.2 Groundwater

The Site achieved a Track 4 Restricted Residential Use cleanup through the implementation of ECs (Site Cover System and SSDS) and an environmental easement that prevents the use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or NYC Health 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.

As no remedial action was performed to remediate groundwater, the results of the RI accurately demonstrate the remaining groundwater conditions on-Site. Tables 9 through 14 and Figure 5 summarize the results of all groundwater samples collected that exceed the AWQSGVs at the Site after completion of the RA.

A summary of the groundwater quality remaining at the Site is provided in the sections below:

VOCs

A summary of the groundwater VOC exceedances in the 11 groundwater samples analyzed is provided below:

VOC Exceedances of AWQSGVs in Groundwater

Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
1,2,4,5-Tetramethylbenzene	5	2	9.6 – 14	TW-15 (3/18/2020)
1,2-Dichloroethene (total)	5	2	12 - 14	TW-6 DUP (12/10/2019)

Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
cis-1,2-Dichloroethene	5	2	12 – 14	TW-6 DUP (12/10/2019)
Benzene	1	1	8	TW-13 (3/17/2020)
Isopropylbenzene (Cumene)	5	1	5.2	TW-15 (3/18/2020)
Naphthalene	10	2	130 – 290	TW-8 (12/10/2019)
N-Propylbenzene	5	1	8	TW-15 (3/18/2020)
Vinyl chloride	2	2	2.4 – 2.5	TW-7 12/10/2019

Roux analyzed groundwater sampled from six monitoring wells for 1,4-dioxane with reduced detections limits. Groundwater samples from temporary monitoring wells TW-12 through TW-17 were analyzed for 1,4-dioxane via 8270SIM. Temporary wells TW-12 and TW-13 were reported as non-detect for 1,4-dioxane. Temporary wells TW-14 through TW-17 ranged in concentration from an estimated 0.0946 µg/L and 0.354 µg/L. Additionally, all other monitoring wells that were analyzed for 1,4-dioxane at higher detection limits were also non-detect.

SVOCs

A summary of the groundwater SVOC exceedances in the 11 groundwater samples analyzed is provided below:

SVOC Exceedances of AWQSGVs in Groundwater

Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
Acenaphthene	20	4	24 – 53	TW-13 3/17/2020
Benzo[a]anthracene	0.002	9	0.06 J – 6	TW-15 3/18/2020
Benzo[a]pyrene	0	9	0.02 J – 11	TW-15 3/18/2020
Benzo[b]fluoranthene	0.002	9	0.03 J – 8	TW-15 3/18/2020
Benzo[k]fluoranthene	0.002	9	0.01 J – 2	TW-15 3/18/2020
Chrysene	0.002	9	0.04 J – 6.8	TW-5 3/16/2020
Indeno[1,2,3-c,d]pyrene	0.002	8	0.03 J – 15	TW-15 3/18/2020
Phenol	1	3	1.1 J – 24	TW-14 3/17/2020

Metals

A summary of the groundwater metals exceedances in the 11 groundwater samples analyzed is provided below:

Metals Exceedances of AWQSGVs in Groundwater

	Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
Total	Antimony	3	1	3.09 J	TW-16 3/20/2020
	Arsenic	25	4	26.25-228.5	TW-15 3/18/2020
	Barium	1000	2	2742 – 4223	TW-12 3/17/2020
	Beryllium	3	2	13.55 – 19.05	TW-12 3/17/2020
	Chromium	50	2	313.9 – 412.8	TW-14 03/17/2020
	Copper	200	3	269.2 – 988.4	TW-12 3/17/2020
	Cyanide	200	1	2310	TW-15 3/18/2020
	Iron	300	11	3900 – 246000	TW-14 3/17/2020
	Lead	25	9	33.39 – 1243	TW-12 3/17/2020
	Magnesium	3500	3	35700 – 47000	TW-8 3/16/2020
	Manganese	300	10	333.8 – 12750	TW-12 3/17/2020
	Mercury	0.7	4	0.84 – 1.5	TW-12 3/17/2020
	Nickel	100	2	244.9 – 292.8	TW-12 3/17/2020
	Selenium	10	3	24.2 – 65.4	TW-12 3/17/2020
	Sodium	20000	8	23500 – 300000	TW-8 3/16/2020
	Thallium	0.5	9	0.66 J– 1.76	TW-14 3/17/2020
Dissolved	Antimony	3	3	4.2 – 7.99	TW-17 3/18/2020
	Arsenic	25	1	28.99	TW-15 3/18/2020
	Iron	300	4	307-7680	TW-8 3/16/2020
	Magnesium	3500	1	40000	TW-8 3/16/2020
	Manganese	300	6	913 - 3642	TW-16 3/18/2020
	Sodium	20000	8	22200 – 306000	TW-8 3/16/2020

PCBs

Eleven discrete groundwater samples and one duplicate sample were analyzed for PCBs. PCBs were not detected in any groundwater samples.

Pesticides and Herbicides

A summary of the groundwater pesticide and herbicide exceedances in the 11 groundwater samples analyzed is provided below:

Pesticide and Herbicide Exceedances of AWQSGVs in Groundwater

Analyte	NYSDEC AWQSGVs (µg/L)	Detections above NYSDEC AWQSGVs	Range in Concentration Above NYSDEC AWQSGVs (µg/L)	Sample with Maximum Detection
Trans-Chlordane	0	4	0.006 J – 0.029 J	TW-13 DUP 3/17/2020

PFAS

Groundwater was analyzed for PFAS in all temporary monitoring wells installed as part of the 2020 sampling event. Maximum Contaminants Levels (MCLs) have just recently been

adopted for PFOA and PFOS are each 10 nanograms per liter (ng/L), respectively. These MCLs were exceeded at several wells across the Site. A summary of the groundwater detections for PFAS are provided in the below table:

PFAS Detections in Groundwater

Analyte	MCLs (ng/L)	Number of Detections	Range in Concentration Detections (ng/L)	Sample with Maximum Detection
N-Ethyl-N-((heptadecafluorooctyl)sulphonyl) glycine	-	1	1.54 J	TW-14
Perfluorobutanesulfonic acid (PFBS)	-	7	4.31 - 46.2	TW-13 DUP
Perfluorobutanoic Acid	-	7	5.6 - 18.9	TW-17
Perfluorodecane Sulfonic Acid	-	1	1.70 J	TW-13
Perfluorodecanoic acid (PFDA)	-	5	0.544 J - 0.983 J	TW-13
Perfluoroheptane Sulfonate (PFHPS)	-	4	0.683 J - 1.66 J	TW-14
Perfluoroheptanoic acid (PFHpA)	-	7	6.88 - 15.6	TW-17
Perfluorohexanesulfonic acid (PFHxS)	-	7	1.92 J - 14.8	TW-17
Perfluorohexanoic acid (PFHxA)	-	7	10.2 - 23.9	TW-17
Perfluorononanoic acid (PFNA)	-	7	0.810 J - 8.1	TW-14
Perfluorooctanesulfonic acid (PFOS)	10	7	6.2 - 351	TW-12
Perfluorooctanoic acid (PFOA)	10	7	31.3 - 64.3	TW-16
Perfluoropentanoic Acid (PFPeA)	-	7	9.25 - 28.9	TW-17
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	-	3	1.31 J - 1.61 J	TW-16
TOTAL PFOA AND PFOS	**-**	**7**	**49.9 - 389**	**TW-12**

2.5.3 Soil Vapor

Soil vapor data was collected during the RI, as discussed in Section 2.3. Laboratory analytical results of the sub-slab soil vapor, indoor air and ambient air samples are summarized on Table 15 and Figure 6.

Of the VOCs analyzed by the laboratory, only eight compounds have guidance values assigned by NYSDOH for sub-slab soil vapor and indoor air concentrations in the updated May 2017 decision matrices contained within the NYSDOH Guidance. The matrices provide guidance relative to carbon tetrachloride, cis-1,2-dichloroethene, 1,1-dichloroethene, trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane, methylene chloride,

and vinyl chloride. A discussion of the VOCs detected relative to the appropriate NYSDOH decision matrix is provided below:

Matrix A Compounds: carbon tetrachloride, cis-1,2-dichloroethene, 1,1-dichloroethene, TCE

- Carbon tetrachloride was detected in indoor air samples at concentrations ranging from 0.365 to 0.503 micrograms per cubic meter ($\mu g/m^3$). There were no detections of carbon tetrachloride in sub-slab soil vapor samples. Therefore, according to Matrix A, no further action is required. Given the Site's current sub-slab soil vapor concentrations, a concentration of 1 $\mu g/m^3$ of carbon tetrachloride would have to be reached in indoor air before further action (identification of source and resampling and mitigation) would be required.
- Cis-1,2-dichloroethene was detected in indoor air samples at concentrations ranging from 0.119 to 4.12 $\mu g/m^3$. Cis-1,2-dichloroethene was detected in sub-slab soil vapor samples at concentrations ranging from 0.793 to 120 $\mu g/m^3$. Therefore, according to Matrix A, mitigative actions are required.
- 1,1-Dichloroethene was not detected in sub-slab soil vapor or indoor air samples. Therefore, according to Matrix A, no further action is required. Given the Site's current sub-slab soil vapor concentrations, a concentration of 1 $\mu g/m^3$ of 1,1-Dichloroethene would have to be reached in indoor air before further action would be required.
- TCE was detected in indoor air samples at concentrations ranging from 0.107 to 0.704 $\mu g/m^3$. TCE was detected in sub-slab soil vapor samples at concentrations ranging from 1.65 to 200 $\mu g/m^3$. Therefore, according to Matrix A, mitigative actions are required.

Matrix B Compounds: PCE, 1,1,1-trichloroethane, methylene chloride

- PCE was detected in indoor air samples at concentrations ranging from 0.136 to 5.93 $\mu g/m^3$. PCE was detected in sub-slab soil vapor at concentrations ranging from 9.15 to 2,540 $\mu g/m^3$. Therefore, according to Matrix B, mitigative actions are required.
- 1,1,1-Trichloroethane was not detected in sub-slab soil vapor or indoor air samples. Therefore, according to Matrix B, no further action is required. Given the Site's current sub-slab soil vapor concentrations, a concentration of 10 $\mu g/m^3$ of 1,1,1-Trichloroethane would have to be reached in indoor air before further action would be required.
- Methylene chloride was detected in indoor air samples at concentrations ranging from 0.051 $\mu g/m^3$ to 0.194 $\mu g/m^3$. Methylene chloride was detected at concentrations ranging from 2.99 to 9.03 $\mu g/m^3$ in sub-slab soil vapor samples. Therefore, according to Matrix B, no further action is required. Given the Site's current sub-slab soil vapor concentrations, a concentration of 10 $\mu g/m^3$ of methylene chloride would have to be reached in indoor air before further action would be required.

Matrix C Compound: vinyl chloride

- Vinyl chloride was detected at concentrations ranging from 0.051 to 0.194 µg/m^3. Vinyl chloride was detected at concentrations ranging from 0.69 to 111 µg/m^3 in sub-slab soil vapor samples. Therefore, according to Matrix C, mitigative actions are required.

Potential soil vapor concerns associated with the elevated soil vapor concentrations were mitigated by the installation of an active SSDS in the existing building and the application of epoxy sealant to the floor slab and interior walls that are below grade completed as part of the 2020 IRMWP. The results of the indoor air sampling at the Site demonstrating that the SSDS was fully functioning as designed are summarized on Figures 6 through 9. The SSDS was installed at the Site as an IRM and is providing effectively negative pressure underneath the slab to prevent VI into the building.

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 D) 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 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 are shown on Figure 2. These ICs are:

- The property may be used for: restricted residential, commercial, and/or industrial use;
- The recorded Environmental Easement must be complied with;
- 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 the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the NYC Health 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.
- Require the Remedial Party (RP) or Site owner to complete and submit to the NYSDEC a periodic certification of institutional controls (ICs) and ECs in accordance with Part 375-1.8(h)(3).
- 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 Site Cover System

Exposure to remaining contamination will be prevented by a Site Cover System placed over the Site. This Site Cover System is currently comprised of an 8-inch-thick concrete slab or 24-inches of gravel and asphalt-covered alleyway. Figure 10 presents the location of the current Site Cover System and applicable demarcation layers. The EWP provided in Appendix D outlines the procedures required to be implemented in the event the Site Cover System is breached, penetrated, or temporarily removed. Procedures for the inspection of this Site Cover System are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Program (CAMP) prepared for the Site

and provided in Appendix E. Any disturbance of the Site Cover System must be overseen by a qualified environmental professional (QEP) as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

3.3.2 Criteria for Completion of Remediation/Termination of Remedial 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 RAs 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 RP receives this approval, the RP will decommission all Site-related monitoring, injection, and recovery wells as per the NYSDEC CP-43 policy.

The RP will also conduct any needed Site restoration activities, such as asphalt patching and decommissioning treatment system equipment. In addition, the RP 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 RP will ensure that no ongoing erosion is occurring on the Site.

3.3.2.1 – Site Cover System

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

3.3.2.2 – SSDS

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

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 provided in Appendix F.

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

- Assessing achievement of the remedial performance criteria
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports to document the monitoring activities.

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

- Annual inspection and periodic certification.
- All designed monitoring systems
- Reporting Requirements.

Reporting requirements are provided in Section 7.0 of this SMP.

The Site is not considered a source of off-site groundwater contamination; therefore, groundwater monitoring is not discussed in this Monitoring Plan. Monitoring programs are summarized in the following table.

Table 16: Monitoring Schedule

Monitoring Program	Frequency	Analysis
Site-Wide Inspections	Annually	Visual inspection of general Site conditions and ECs
Indoor Air Sampling	Semi-annually	Indoor Air Sampling for VOCs via USEPA Method TO-15 at IA-1, IA-2, IA-4, IA-5, IA-6, IA-9, IA-F1C, IA-F2C, and IA-F3C

Monitoring Program	Frequency	Analysis
Composite Cover System Inspections	Annually	Visual inspection of composite cover system components
SSD System Inspections	Semi-annually	Visual inspection of above-ground system components and alarm testing

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

4.2 Site – Wide Inspection

Site-wide inspections will be performed at a minimum of once per year. These periodic inspections must be conducted when the ground surface is visible (i.e., no snow cover). Site-wide inspections will be performed by a QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE 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. During these inspections, an inspection form will be completed as provided in Appendix G – 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
- Confirm 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 plan.

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 NYCCR 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.

4.3 Composite Cover System Monitoring

A composite cover system, comprised of the 8-inch-thick concrete cellar slab and the asphalt or 24-inch gravel layer in the alleyway, serves as a protective barrier mitigating the risk of exposure to the remaining contamination. The cover system plan is presented as Figure 10. Inspection of the cover system by a professional engineer, or a qualified environmental professional under the direction of a professional engineer, is required on a regular schedule at a minimum of once per year and following any severe weather or other conditions that could affect the cover. Unscheduled inspections may take place when a suspected failure of the cover system has been reported or an emergency occurs that is deemed likely to affect the cover system. Modification to the frequency or sampling requirements will require approval from the NYSDEC. During these inspections, a Site inspection form will be completed. The inspection requires sufficient information to certify that all elements of the cover system described above are effective and should document any cover system disturbances. Any damage to the cover system identified during the inspection will be repaired in kind and in compliance with this SMP.

4.4 SSDS Monitoring

Inspection will be conducted on a semi-annual basis to confirm that the SSDS is operational and performing within the design specifications. A visual inspection of the above-ground system components will be conducted during the monitoring event. SSDS components to be monitored include, but are not limited to the following:

- Vacuum blower
- General system piping
- Vacuum Monitoring points

A complete list of components to be checked is provided in the Inspection Checklist, included in Appendix G. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, applicable maintenance and repairs will be conducted per the Operation and Maintenance Plan, and the SSD system will be restarted.

This Monitoring Plan may only be modified with the approval of NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSD system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the SSD systems are specified below, in Section 5 of this SMP.

4.5 Media Monitoring and Sampling Quality Assurance/Quality Control

With the exception of the indoor air sampling to evaluate the efficacy of the ongoing SSDS operation, which will follow the procedure discussed in Section 5, media monitoring is not required under this SMP.

Any future indoor air sampling be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the Site (Appendix F). All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix G - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific QAPP provided as Appendix F of this document.

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

Information on non-mechanical ECs (i.e., cover system) is provided in Section 3. A copy of this Operation and Maintenance Manual, along with the complete SMP, is to be maintained at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Operation and Maintenance of SSDS

The following sections provide a description of the operations and maintenance of SSDS. Cut-sheets and as-built drawings for SSDS are provided in Appendix H - Operations and Maintenance Manual.

Details of the SSDS design and layout are provided in the Engineering and Institutional Control Plan section of the SMP. SSDS as-built drawings are included as Plate 1. SSDS component manuals are appended to this SMP as Appendix H.

5.2.1 System Start-Up and Testing

Prior to initial start-up of the SSDS for the building, system electrical checks and visual pipe inspections were completed to ensure a leak tight conveyance system and blower unit operability. In addition, the following performance monitoring checks were performed:

- Confirm operation of the alarm warning light;
- Confirm acceptable air flow rate from the blower by a visual inspection of the gauge affixed to the blower;
- Collect vacuum measurements from soil vapor monitoring points;

- Collect PID readings; and
- Collect confirmation effluent air samples.

This system testing will also be conducted if, in the course of the SSDS lifetime, significant changes are made to the system, and the system must be restarted. The blower unit for the SSDS was started up for continuous operation on August 5, 2020.

Routine operations should be conducted with the switch in Auto Mode and the in-line valves at the pit and inlet to the blower units open and the sampling port valve closed. Refer to Appendix H for equipment manuals and data sheets for all equipment, devices, and appurtenance installed for the SSDS.

Baseline measurements and operating data of the blower system vacuums at the suction pits and blower inlet are included in Appendix G.

5.2.1.1 Vapor Discharge Sampling

The SSDS is currently operational. If, in the course of the SSDS lifetime, significant changes are made to the system, and the system must be restarted, potential impacts of the SSDS emissions to neighboring structures or other sensitive receptors will be reevaluated with performance monitoring of the SSDS. This evaluation will include monitoring the system effluent VOC concentrations using a PID. The total VOC concentration will be recorded on the SSDS Operating Data- Blower and Suction Pits Log Sheet, along with the blower inlet vacuum.

In addition, during start-up of the SSDS, an effluent air sample was collected from the discharge of the effluent stack using a Summa canister. These samples were analyzed by a New York State ELAP laboratory in accordance with EPA Method TO-15 and it was verified that vapor treatment is not needed. The effluent air sample results were compared to the DAR-1 Air Guide guidance values. If future sample results indicate that treatment is required, appropriate treatment options will be implemented and evaluated periodically.

5.2.2 Routine System Operation and Maintenance

The SSDS blower unit is designed to operate continuously and does not need to be turned on or off as part of routine operations. The system has vacuum gauges located at the suction

pit piping header and at the inlet (vacuum) side. If equipment readings are not within specification or equipment is observed to be malfunctioning, the system should be shut down immediately to perform maintenance and repair per the Operations, Maintenance and Monitoring (OM&M) Plan. Once the repair is complete, the SSDS should be restarted.

The routine maintenance activities include visual inspections, operating data collection and general maintenance. The system operator will visually inspect the system and note any conditions which present a potential hazard or could cause future system shutdown. In the field, special attention will be paid to the condition of the blowers and appurtenances, and the above slab discharge piping and supports. Special attention should be given to any unusual or excessive noise or vibrations from the piping and blower. The piping and valves will be inspected for leaks.

All equipment maintenance and inspections will be performed in accordance with manufacturer's instructions (see Appendix H for specifications). Specific routine maintenance tasks are outlined below:

- Inspect control panel and warning lights/alarms;
- Inspect blower piping to confirm operation of appropriate valves (i.e., dilution valve);
- Inspect vacuum/pressure gauges for proper operation;
- Check and clean air filter on each moisture knockout tank; and
- Check for the presence of and remove water in each knockout tank.

In the event that a condition warranting system component maintenance is identified, the appropriate reporting and maintenance should be conducted immediately. Manufacturer's recommendations for system component maintenance are included in the component manuals in Appendix H. Any maintenance completed for the SSDS should be documented in the SSDS Operations, Maintenance, Monitoring, and Sampling Tracking Sheet included in Appendix G.

All waste materials generated shall be placed in a sealed bag or container and placed in the drum labeled "SSDS Waste Material" located in the building's drum storage area.

5.2.3 Non-Routine Operation and Maintenance

Non-routine equipment maintenance consists of maintenance activities that will be performed with less frequency than routine maintenance (i.e., semi-annually) on several system components. Specific non-routine maintenance tasks are outlined below:

- Inspect and test alarm;
- Check float switch for proper operation;
- Replacement of vacuum/pressure gauges; and
- Change bearings on blowers after 15,000 hours of operation.

Most damage or problems associated with SSDS components will trigger one of the alarms. Damage to any SSDS components will be noted in the routine and detailed system inspections and remedied upon identification. Manufacturer's recommendations for SSDS maintenance are included in the component manuals in Appendix H. Any maintenance completed for the SSDS should be documented in the SSDS Operations, Maintenance, Monitoring, and Sampling Tracking Sheet included in Appendix G.

For all troubleshooting and maintenance activities refer to Site Health and Safety requirements including contacting Roux personnel before conducting maintenance or repairs of the SSDS. In addition, all maintenance activities shall consider the following procedures:

- If maintenance is needed for the piping from the suction pit isolation valve to the blower inlet valves, the suction pit isolation valve must be closed to prevent sub-slab vapors from entering the piping section during maintenance activities.
- If maintenance is needed for the piping from the blower inlet valve to the blower unit and blower discharge piping, the blower inlet valve must be closed.
- If damage has occurred to or repairs are needed for the piping section from the subsurface suction pit to inlet side of the suction pit isolation valve, appropriately trained personnel must be used to prevent the potential migration of sub-slab vapors into the piping section.
- Access to the interior of the control panels will require shutdown of the blower system by turning the keyed selector switch and the 230/460V disconnect switch, located of the front face of the panel, to the OFF positions, and unlocking the panel. (Refer to Site Health and Safety requirements for all activities associated with electrical systems including Lockout/Tagout procedures). Once the appropriate maintenance measures have been assessed and completed, the system can be restarted by re-energizing the control panel via the 230/460V disconnect, turning

the keyed selector switch to the Hand Mode, confirming the blower restarts and that the operational conditions reviewed during the trouble shooting and maintenance activities hand been address and are within normal operating ranges. Once confirmed, change the keyed selector switch to the Auto Mode.

In the event that low SSDS air flow rates or vacuum are observed anywhere in the system, further system balancing may be necessary following moisture removal to ensure that the combined air flow rates and vacuum in a given area of the Site achieve the minimum design requirements.

Table 17 provides a summary and schedule of routine maintenance.

5.2.4 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.

5.2.5 Emergency Telephone Numbers

11-20 46th Road Owner LLC is the owner of the SSDS and assumes the overall responsibility for the operation and maintenance of the SSDS. However, as a representative of 11-20 46th Road Owner LLC is not scheduled to be on-Site on a daily basis, it is the responsibility of the building tenant to notify 11-20 46th Road Owner LLC if an environmentally-related situation or unplanned occurrence requiring assistance arises at the Site (e.g., the sounding of an alarm).

In the event of any environmentally-related situation or unplanned occurrence requiring assistance, 11-20 46th Road Owner LLC or their designated representative should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to the 11-20 46th Road Owner LLC's qualified environmental professional. These emergency and general contact lists must be maintained in an easily accessible location.

Emergency Contact Numbers

Medical, Fire, and Police	911
One Call Center	(800) 272-4480 (3-day notice required for utility markout)
Poison Control Center	(800) 222-1222
Pollution Toxic Chemical Oil Spills	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

General Contact Numbers

Roux Environmental Engineering & Geology, D.P.C. – David Kaiser, P.E.	(631) 232-2600 or (516) 849-0562
Owner's Representative – David Schwarz	(917) 485-1733
NYSDEC Project Manager – Christopher Allan	(718) 482-4065

* Note: Contact numbers subject to change and should be updated as necessary.

5.3 SSDS PERFORMANCE MONITORING

To ensure that the SSDS performs as designed, the monitoring plan described below will be implemented.

5.3.1 General Equipment Monitoring and Monitoring Schedule

System monitoring will be performed by collecting operating data such as flow rates, vacuums and pressures from the SSDS components and measuring vacuum in the sub-slab vapor monitoring points. Periodic review reports and other information generated during regular operations must be kept on-file at the Site. Reports, forms, and other relevant information generated must be available upon request to the NYSDEC and will be submitted as part of the annual Periodic Review Report required to be submitted to the NYSDEC by the Site owner following the receipt of the certificate of completion (COC).

A summary of the performance monitoring schedule is provided in the table below and additional detail is provided in the following sections.

Table 17: Schedule for Routine Maintenance

Task	Frequency
General Equipment Monitoring	Monthly
Vapor Discharge Sampling	Semi-annually with PID (A sample will only be collected for laboratory analysis as part of the initial system start-up)
Verification Indoor Air Sampling and Vacuum Confirmation Testing	Semi-annually (at least once during heating season)

A visual inspection of the complete system will be conducted during each monitoring event (see checklist in Appendix G). The SSDS components to be monitored include, but are not limited to, the following:

- Vacuum/pressure and air flow readings at each blower;
- Vacuum readings at the sub-slab vapor monitoring points; and
- Liquid level in the moisture knockout tank.

A complete list of components to be checked is provided in the SSDS Operations and Maintenance Form presented in Appendix G. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance, and repair as per this OM&M Plan are required immediately, and the SSDS should be restarted.

The SSDS will be monitored on a monthly basis. Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections, maintenance 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. Monitoring deliverables for the SSDS are specified in Section 4.

5.3.2 Vacuum Confirmation Testing

Vacuum confirmation testing will be conducted semi-annually at each permanent vacuum monitoring point installed within the SSDS building area that is a part of the monitoring network and shall consist of:

- Confirming blower operations prior to testing;

- Testing for differential pressure change in the sub-slab area utilizing a micro-manometer device with a sensitivity of 0.002 inches of water (vacuum) which will be connected to the vacuum monitoring point; and
- Recording sub-slab vacuum on the Sub-Slab Vacuum Monitoring Data Log Sheet.

If adequate depressurization is not occurring, the cause for the lack of depressurization will be investigated and repaired and measurements will be collected again. All vacuum confirmation testing activities will be reported to the NYSDEC in the annual Periodic Review Report.

5.3.3 System Monitoring Devices and Alarms

The SSDS has a warning device to indicate that the system is not operating properly. In the event that warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the SSDS system will be restarted. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

The blower will have a float switch for the moisture knockout tank to indicate a high liquid level in the knockout tank that will shut down the SSDS. The blower also has an overload relay that will shut down the blower if the voltage or current are too high. The SSDS blower control panels contain indicator lights that will illuminate GREEN when the blower unit is operated in Auto Mode. If a low differential pressure reading of less than 0.01" W.C. is observed at the control panel, a pressure switch will shut the blower unit OFF and illuminate a RED alarm indicator light. The alarm is located near the director's desk on the 1st upper floor level. The alarm is also connected to a telemetry system where a designated representative from 11-20 46th Road Owner LLC will be notified via text message if the alarm goes off. This alarm is typically associated with a low air flow condition. In the event that there is an alarm condition, or the blower units do not operate in either the Auto or Hand Mode, initiate troubleshooting per Section 2.4, complete applicable maintenance and repairs as specified, then restart the SSDS. Operational problems must be noted in the SSDS Operations, Maintenance, Monitoring, and Sampling Tracking Sheet provided in Appendix G.

5.3.4 Verification Indoor Air Sampling

Verification indoor air sampling will be performed in the cellar of the building on a semi-annual basis. The sample frequency will be on a semi-annual basis with at least one of the sampling events occurring during the heating season, which is from November 15th through the following March 15th. Indoor air sampling will be performed in occupied rooms such as an office space (rather than a storage room). The following locations will be sampled during the subsequent sampling events after the first year of SSDS operation: IA-1, IA-2, IA-4, IA-5, IA-6, IA-9, IA-F1C, IA-F2C, and IA-F3C.

Sampling will be performed using a SUMMA® canister with flow regulator set to fill at a rate no greater than 0.1 liters/minute, for an eight-hour sample collection period. The analyses will be performed at a New York State ELAP laboratory in accordance with EPA Method TO-15. Results of the indoor air quality sampling program will be presented in the annual Periodic Review Report.

5.4. Carbon Drum Operations And Maintenance

In addition to and beyond the scope of the IRM that was approved by NYSDEC, an 85-gallon activated carbon air filter drum with a fan on top was installed in the mechanical space in the northeast corner of the cellar as a precautionary measure. This small, unoccupied space is located in a localized area of the Site where the slab elevation is approximately 20-inches lower than the surrounding cellar slab elevation, and it is partially segregated from the rest of the cellar by deep subsurface foundation elements that may intersect the shallow water table when water table elevations are elevated. As a precautionary measure in the event there is intermittent interruption of vacuum influence in this small, unoccupied area of the building, this activated carbon air filter drum was installed as an extra protective measure. This activated carbon air filter drum is intended to run continuously.

The activated carbon air filter drum is an F-series unit (F-85) manufactured by General Carbon Corp. of Paterson, New Jersey. The drum diameter is 28 inches, and the height is 39 inches, and the drum holds 300 pounds of activated carbon. The fan sits on top of the drum and rises an additional 18 inches. The total height is approximately 4.5 feet tall, and the total

width is slightly more than 2 feet in diameter. The fan uses 115/230 V (single phase) and ¾ horsepower (which is approximately 4.5 Amps and a slightly less than 5,000 kW-Hr per year). The drum has intake and exhaust fittings. The inlet and outlet are both on the top of the drum. The fan is mounted on the outlet side of the drum and pulls air through the vessel. To mitigate the noise issues associated with the exhaust coming directly out of the drum, an elbow and a length of 4-inch pipe was installed to muffle the sound.

5.4.1 Manufacturer's Specifications, Operations Procedures and Maintenance Requirements

The manufacturer's manual for the activated carbon air filter drum is included in Appendix H. As part of the monthly equipment inspection of the SSDS described in Section 3 of this OM&M Plan, the activated air filter drum will also be inspected to ensure that it is operational. The initial 300 pounds of carbon should be adequate for a year of operations. Carbon changeout will be performed on a yearly basis, unless additional monitoring/sampling warrants a different carbon replacement frequency. The spent granular carbon will be properly characterized, picked up and properly disposed of or regenerated at an off-site facility in accordance with all appropriate rules and regulations.

5.5 Maintenance And Periodic Review Reporting Requirements

Maintenance reports and any other information generated during regular operations of the SSDS will be kept on-file with designated facility personnel. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and will be submitted as part of the Periodic Review Report.

5.5.1 Routine Maintenance Reports

The SSDS Operations, Maintenance, Monitoring, and Sampling Tracking Sheet included in Appendix G will be completed during each routine maintenance event and will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- 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 form).

5.5.2 Non-Routine Maintenance Reports

The SSDS Operations, Maintenance, Monitoring, and Sampling Tracking Sheet included in Appendix G will be completed during each non-routine maintenance event, and will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Date of repair;
- Other repairs or adjustments made to the system;
- 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.

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 remedial systems. Vulnerability assessments provide information so that the Site and associated remedial 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 ECs to severe storms/weather events and associated flooding.

According to the preliminary Federal Emergency Management Agency Flood Insurance Rate Map No. 3604970202F effective September 5, 2007, the Site is located in an area of minimal flood hazard.

The building, which encompasses the entire Site footprint, will protect the SSDS and composite cover system from extreme wind conditions and stormwater drainage overflow.

The SSDS receives electrical service from Consolidated Edison, Inc. A power loss and/or dips/surges in voltage during a severe weather event, including lightning strikes, may impact the SSDS equipment and operations.

6.2 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, and as reported in the PRR. Waste resulting from soil and

or/or groundwater sampling is not anticipated to be generated. This was a green remediation project since minimal energy was expended to implement the remedy with the exception of the electricity needed to install and operate the SSDS.

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the NYSDEC project manager 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.

6.2.2. Remedial Systems

Remedial 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.

- An SSDS effluent air sample was collected during the system start-up to monitor emissions. Analytical results were used to verify that contaminant concentrations detected in the vapor sample comply with NYSDEC Policy DAR-1.

6.2.3 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.

6.2.4 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 have been prepared so that these tasks can be

accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

6.3 Remedial System Optimization

An RSO 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 RSO may be appropriate if any of the following occur:

- Remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- Management and operation of the remedial system is exceeding the estimated costs;
- Remedial 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 the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available to remediate contaminants that are not listed in the Certificate of Completion. Contaminants listed in the Certificate of Completion are associated with a liability release for no further action.

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

The RSO study will focus on 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 RSO.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All Site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix G. These forms are subject to NYSDEC revision. All Site management inspection, maintenance, and monitoring events will be conducted by a QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE 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 16 and summarized in the PRR.

Table 18: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency
Inspection Report	Annually, or as otherwise determined by the NYSDEC
Periodic Review Report	First report 16 months after COC is issued, then annually until completion and documentation of all development-related construction, then every 3 years thereafter.

Note: 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);

- Copies of all field forms completed (e.g., inspection logs);
- 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;
- 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™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A 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 until completion and documentation of all development-related construction, then every 3 years thereafter 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 (if any) 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.
- 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 (soil vapor, etc.), which include 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.
- 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 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, ROD or Decision Document; and
- The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Certification of Institutional and Engineering Controls will be included in the PRR: Following the last inspection of the reporting period, a PE 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;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and*
- *The information presented in this report is accurate and complete.*

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

Roux Environmental Engineering and Geology, D.P.C.*, am certifying as* Owner's Designated Site Representative *for the Site.*

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

Every five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the PRR.

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

8.0. REFERENCES

NYSDEC – 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).

6 NYCRR Part 375 – Environmental Remediation Programs (December 14, 2006).

NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation (May 2010).

NYSDEC DER-31 – Green Remediation (August 2010).

Phase I Environmental Site Assessment, prepared by HydroTech, dated August 19, 2015.

Phase I Environmental Site Assessment, prepared by Nova Consulting, dated July 18, 2019.

NYSDEC DAR-1 – Guidelines for the Evaluation and Control of Ambient Air Contaminants under Part 212 (June 2016).

6 NYCRR Part 703.5 – Water Quality Standards (January 31, 2017).

NYSDOH – Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006 and updated May 2017).

Interim Remedial Measures Work Plan, prepared by Roux, dated June 9, 2020.

Construction Completion Report, prepared by Roux, dated July 2, 2021.

NYSDEC. Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs (January 2021).

Remedial Investigation Report, prepared by Roux, dated September 9, 2021.

Draft Remedial Action Work Plan, prepared by Roux, dated October 18, 2021.

TABLES

Notes Utilized Throughout Tables	
Soil Tables	
J -	Estimated value
U -	Indicates that the compound was analyzed for but not detected
R -	Sample results rejected by validator
UJ -	Analyte was not detected. The associated reported quantitation limit is an estimate
ft bls -	Feet below land surface
FD -	Duplicate sample
NA -	Compound was not analyzed for by laboratory
NS -	Not sampled
mg/kg -	Milligrams per kilogram
µg/kg -	Micrograms per kilogram
NYSDEC -	New York State Department of Environmental Conservation
SCO -	Soil Cleanup Objectives
--	No SCO available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use SCO	
Shaded data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential SCO	
Red data indicates that parameter was detected above the NYSDEC Part 375 Protection of Groundwater SCO	
For Per- and Polyfluoroalkyl Substances and 1.4-Dioxane, bold data indicates that parameter was detected; undetected results reflect Minimum Detection Limits	
Groundwater Tables	
J -	Estimated Value
U -	Compound was analyzed for but not detected
FD -	Duplicate
NA -	Compound was not analyzed for by laboratory
µg/L -	Micrograms per liter
ng/L -	Nanogram per liter
NYSDEC -	New York State Department of Environmental Conservation
AWQSGVs -	Ambient Water-Quality Standards and Guidance Values
--	No NYSDEC AWQSGV available
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs	
For Per- and Polyfluoroalkyl Substances and 1.4-Dioxane, bold data indicates that parameter was detected; undetected results reflect Minimum Detection Limits	
Soil Vapor/Ambient Air Tables	
J -	Estimated value
U -	Indicates that the compound was analyzed for but not detected
FD -	Duplicate sample
ug/m3 -	Micrograms per cubic meter
Bold data indicates that parameter was detected	

Table 2. Summary of Groundwater Elevation Measurements,11-20 46th Road Site, Long Island City, NY (NYSDEC BCP Site No. C241242)

Monitoring Well Identification	Measuring Point Elevation (ft-NAVD 88)	12/11/2019 Depth to Water (ft-btoc)	12/11/2019 Depth to Bottom (ft-btoc)	12/11/2019 Water Elevation (ft-NAVD 88)	3/18/2020 Depth to Water (ft-btoc)	3/18/2020 Depth to Bottom (ft-btoc)	3/18/2020 Water Elevation (ft-NAVD 88)	5/5/2020 Depth to Water (ft-btoc)	5/5/2020 Depth to Bottom (ft-btoc)	5/5/2020 Water Elevation (ft-NAVD 88)	Well Type
TW-1	--	--	--	--	--	--	--	--	--	--	Temporary 1" PVC
TW-2	--	4.50	5.50	--	--	--	--	--	--	--	Temporary 1" PVC
TW-3	6.23	1.95	6.90	4.28	--	--	--	--	--	--	Temporary 1" PVC
TW-4	6.15	1.40	6.20	4.75	3.34	6.21	2.81	2.88	6.12	3.27	Temporary 1" PVC
TW-5	6.18	2.25	7.35	3.93	3.62	6.66	2.56	2.87	6.40	3.31	Temporary 1" PVC
TW-6	6.30	2.05	5.35	4.25	2.27	6.41	4.03	2.24	5.15	4.06	Temporary 1" PVC
TW-7	6.27	1.90	6.62	4.37	2.39	6.62	3.88	2.16	6.60	4.11	Temporary 1" PVC
TW-8	4.40	0.60	7.35	3.80	0.60	7.55	3.8	*	7.50	--	Temporary 1" PVC
TW-12	6.17	--	--	--	2.30	6.96	3.87	2.05	6.75	4.12	Temporary 1" PVC
TW-13	6.13	--	--	--	2.41	5.36	3.72	2.07	6.34	4.06	Temporary 1" PVC
TW-14	4.37	--	--	--	0.60	6.38	3.77	0.65	6.35	3.72	Temporary 1" PVC
TW-15	6.14	--	--	--	3.31	5.58	2.83	2.85	5.50	3.29	Temporary 1" PVC
TW-16	6.16	--	--	--	3.22	7.09	2.94	2.75	6.82	3.41	Temporary 1" PVC
TW-17	6.09	--	--	--	3.33	5.37	2.76	2.83	5.38	3.26	Temporary 1" PVC

ft = feet
NAVD88 = North American Vertical Datum of 1988
btoc = below top of well casing
-- = Temporary well was abandoned prior to gauging event or was not yet installed.

* Temporary well TW-8 was flooded on May 5, 2020 and unable to be properly gauged.

Table 3. Summary of Volatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	Sample Designation:	SB-1	SB-2	SB-3	SB-3	SB-4	SB-4	SB-5	SB-6	SB-6	SB-6	SB-7	SB-8
					Sample Date:	10/21/2019	10/21/2019	10/21/2019	12/11/2019	12/11/2019	12/10/2019	12/10/2019	12/10/2019	12/09/2019	12/09/2019	12/09/2019	12/09/2019	12/10/2019
					Sample Depth (ft bls):	0 - 2	0 - 2	1 - 3	1 - 3	5 - 7	3 - 5	5 - 7	5 - 7	1 - 3	1 - 3	5 - 7	5 - 7	0 - 2
					Normal or Field Duplicate:	N	FD	N	N	N	N	N	N	N	FD	N	N	N
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
1,1,2-Trichloroethane	--	--	--	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
1,1-Dichloropropene	--	--	--	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.072 J	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,2,3-Trichloropropane	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.00035 J	3.1	0.053 J	0.059 J	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.52	0.032 J	0.052 J	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG		0.0037 U	0.004 U	0.0034 U	0.0048 U	0.0039 U	0.51 U	0.2 U	0.21 U	0.0032 U	0.0035 U	0.0031 U	0.0031 U	0.21 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
1,2-Dichloropropane	--	--	--	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.00045 J	0.0026 U	0.19 J	0.014 J	0.021 J	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,3-Dichloropropane	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,4-Diethyl Benzene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.6	0.023 J	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG		0.098 U	0.11 U	0.09 U	0.13 U	0.1 U	14 U	5.5 U	5.6 U	0.086 U	0.094 U	0.084 U	0.083 U	5.5 U
2,2-Dichloropropane	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
2-Chlorotoluene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
2-Hexanone	--	--	--	MG/KG		0.012 U	0.013 U	0.011 U	0.016 U	0.013 U	1.7 U	0.68 U	0.7 U	0.011 U	0.012 U	0.01 U	0.01 U	0.69 U
4-Chlorotoluene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
4-Ethyltoluene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.27 J	0.14 U	0.034 J	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Acetone	**0.05**	100	0.05	MG/KG		0.0088 J	0.0072 J	0.013	0.039	0.029	**3.2**	**4**	**1.1**	0.018	0.018	0.018	0.019	**3.1**
Acrylonitrile	--	--	--	MG/KG		0.0049 U	0.0054 U	0.0045 U	0.0064 U	0.0052 U	0.68 U	0.27 U	0.28 U	0.0043 U	0.0047 U	0.0042 U	0.0042 U	0.28 U
Benzene	0.06	4.8	0.06	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.012 J	0.012 J	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
Bromobenzene	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Bromochloromethane	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Bromodichloromethane	--	--	--	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
Bromoform	--	--	--	MG/KG		0.0049 U	0.0054 U	0.0045 U	0.0064 U	0.0052 U	0.68 U	0.27 U	0.28 U	0.0043 U	0.0047 U	0.0042 U	0.0042 U	0.28 U
Bromomethane	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Carbon Disulfide	--	--	--	MG/KG		0.012 U	0.013 U	0.011 U	0.016 U	0.013 U	1.7 U	0.68 U	0.7 U	0.011 U	0.012 U	0.01 U	0.01 U	0.69 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
Chlorobenzene	1.1	100	1.1	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
Chloroethane	--	--	--	MG/KG		0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Chloroform	0.37	49	0.37	MG/KG		0.0018 U	0.002 U	0.0017 U	0.0024 U	0.002 U	0.26 U	0.1 U	0.1 U	0.0016 U	0.0018 U	0.0016 U	0.0016 U	0.1 U
Chloromethane	--	--	--	MG/KG		0.0049 U	0.0054 U	0.0045 U	0.0064 U	0.0052 U	0.68 U	0.27 U	0.28 U	0.0043 U	0.0047 U	0.0042 U	0.0042 U	0.28 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.25	0.068 U	0.07 U	0.00029 J	0.00073 J	0.0013	0.001 U	0.069 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG		0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
Cymene	--	--	--	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.12 J	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
Dibromochloromethane	--	--	--	MG/KG		0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U

Table 3. Summary of Volatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	SB-1 10/21/2019 0 - 2 N	SB-1 10/21/2019 0 - 2 FD	SB-2 10/21/2019 1 - 3 N	SB-3 12/11/2019 1 - 3 N	SB-3 12/11/2019 5 - 7 N	SB-4 12/10/2019 3 - 5 N	SB-4 12/10/2019 5 - 7 N	SB-5 12/10/2019 5 - 7 N	SB-6 12/09/2019 1 - 3 N	SB-6 12/09/2019 1 - 3 FD	SB-6 12/09/2019 5 - 7 N	SB-7 12/09/2019 5 - 7 N	SB-8 12/10/2019 0 - 2 N
Dibromomethane	--	--	--	MG/KG	0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.012 U	0.013 U	0.011 U	0.016 U	0.013 U	1.7 U	0.68 U	0.7 U	0.011 U	0.012 U	0.01 U	0.01 U	0.69 U
Dichloroethylenes	--	--	--	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.00076 J	0.00024 J	0.25	0.068 U	0.07 U	0.00029 J	0.00073 J	0.0013	0.001 U	0.069 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Ethylbenzene	1	41	1	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.088 J	0.016 J	0.012 J	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
Hexachlorobutadiene	--	--	--	MG/KG	0.0049 U	0.0054 U	0.0045 U	0.0064 U	0.0052 U	0.68 U	0.27 U	0.28 U	0.0043 U	0.0047 U	0.0042 U	0.0042 U	0.28 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.25	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
m,p-Xylene	--	--	--	MG/KG	0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.21 J	0.068 J	0.1 J	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.012 U	0.013 U	0.011 U	0.016 U	0.013 U	1.7 U	0.68 U	0.7 U	0.011 U	0.012 U	0.01 U	0.01 U	0.69 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.012 U	0.013 U	0.011 U	0.016 U	0.013 U	1.7 U	0.68 U	0.7 U	0.011 U	0.012 U	0.01 U	0.01 U	0.69 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0061 U	0.0067 U	0.0056 U	0.008 U	0.0065 U	0.86 U	0.34 U	0.35 U	0.0054 U	0.0059 U	0.0052 U	0.0052 U	0.34 U
Naphthalene	**12**	100	12	MG/KG	0.0049 U	0.0054 U	0.0045 U	0.0064 U	0.0052 U	**33**	0.16 J	0.059 J	0.00086 J	0.00092 J	0.0042 U	0.0042 U	0.058 J
N-Butylbenzene	12	100	12	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.63	0.011 J	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.012 J
N-Propylbenzene	**3.9**	100	3.9	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.54	0.012 J	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.11 J	0.023 J	0.026 J	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.5	0.068 U	0.011 J	0.0011 U	0.0012 U	0.001 U	0.001 U	0.012 J
Styrene	--	--	--	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.046 J	0.14 U	0.029 J	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0024 U	0.0027 U	0.0023 U	0.0032 U	0.0026 U	0.34 U	0.14 U	0.14 U	0.0022 U	0.0023 U	0.0021 U	0.0021 U	0.14 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.01	0.0073	0.0058	0.00092	0.00065 U	0.067 J	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
Toluene	0.7	100	0.7	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.11 J	0.037 J	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00061 U	0.00067 U	0.00056 U	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0018 U	0.002 U	0.0017 U	0.00076 J	0.00024 J	0.26 U	0.1 U	0.1 U	0.0016 U	0.0018 U	0.0016 U	0.0016 U	0.1 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0061 U	0.0067 U	0.0056 U	0.008 U	0.0065 U	0.86 U	0.34 U	0.35 U	0.0054 U	0.0059 U	0.0052 U	0.0052 U	0.34 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00061 U	0.00067 U	0.00041 J	0.0008 U	0.00065 U	0.086 U	0.034 U	0.035 U	0.00054 U	0.00059 U	0.00052 U	0.00052 U	0.034 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0049 U	0.0054 U	0.0045 U	0.0064 U	0.0052 U	0.68 U	0.27 U	0.28 U	0.0043 U	0.0047 U	0.0042 U	0.0042 U	0.28 U
Vinyl Acetate	--	--	--	MG/KG	0.012 U	0.013 U	0.011 U	0.016 U	0.013 U	1.7 U	0.68 U	0.7 U	0.011 U	0.012 U	0.01 U	0.01 U	0.69 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	0.17 U	0.068 U	0.07 U	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0012 U	0.0013 U	0.0011 U	0.0016 U	0.0013 U	**0.32 J**	0.091 J	0.13 J	0.0011 U	0.0012 U	0.001 U	0.001 U	0.069 U

Table 3. Summary of Volatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

			Sample Designation:		SB-8	SB-9	SB-9	SB-10	SB-10	SB-11	SB-11	SB-12	SB-12	SB-13	SB-13	SB-14	SB-14
			Sample Date:		12/10/2019	12/09/2019	12/09/2019	12/11/2019	12/11/2019	12/11/2019	12/11/2019	01/13/2020	01/13/2020	01/13/2020	01/13/2020	01/13/2020	01/13/2020
			Sample Depth (ft bls):		4 - 6	2 - 4	5 - 7	3 - 5	5 - 7	3 - 5	5 - 7	0 - 2	11 - 13	0 - 2	6 - 8	7 - 9	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N
Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units													
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.058 U	0.1 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.058 U	0.002 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.058 U	0.1 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
1,1-Dichloropropene	--	--	--	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	2.2	0.0018 J	0.0028 U	0.25	0.0022 U	0.0019 U	0.002 U	0.0025 U	1.3	0.0029 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.12 U	0.0039 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.12 U	0.00099 J	0.0039 U	0.098 J	0.002 U	0.0028 U	0.042 J	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.087 J	0.0029 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.17 U	0.0059 U	0.0059 U	0.27 U	0.003 U	0.0042 U	0.23 U	0.0033 U	0.0028 U	0.0029 U	0.0038 U	0.23 U	0.0043 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.058 U	0.1 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.058 U	0.1 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
1,2-Dichloropropane	--	--	--	MG/KG	0.058 U	0.1 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.12 U	0.00045 J	0.0039 U	0.033 J	0.002 U	0.0028 U	0.018 J	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.022 J	0.0029 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
1,3-Dichloropropane	--	--	--	MG/KG	0.12 U	0.0039 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.46	0.00035 J	0.0028 U	0.043 J	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.036 J	0.0029 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	4.6 U	0.16 U	0.16 U	7.2 U	0.08 U	0.11 U	6 U	0.088 U	0.075 U	0.078 U	0.1 U	6.2 U	0.12 U
2,2-Dichloropropane	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
2-Chlorotoluene	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
2-Hexanone	--	--	--	MG/KG	0.58 U	0.02 U	0.02 U	0.9 U	0.01 U	0.014 U	0.76 U	0.011 U	0.0094 U	0.0098 U	0.012 U	0.78 U	0.014 U
4-Chlorotoluene	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
4-Ethyltoluene	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.054 J	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.067 J	0.0029 U
Acetone	**0.05**	100	0.05	MG/KG	**1.8**	**9.4 J**	**0.068 J**	**1.8**	0.015	0.037	**0.97**	0.011 U	0.01	0.0098 U	0.012 U	0.78 U	0.014 U
Acrylonitrile	--	--	--	MG/KG	0.23 U	0.0078 U	0.0079 U	0.36 U	0.004 U	0.0057 U	0.3 U	0.0044 U	0.0037 U	0.0039 U	0.005 U	0.31 U	0.0058 U
Benzene	0.06	4.8	0.06	MG/KG	0.029 U	0.0071 J	0.00033 J	0.018 J	0.0005 U	0.00071 U	0.022 J	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
Bromobenzene	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
Bromochloromethane	--	--	--	MG/KG	0.12 U	0.0039 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
Bromodichloromethane	--	--	--	MG/KG	0.029 U	0.00098 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
Bromoform	--	--	--	MG/KG	0.23 U	0.0078 U	0.0079 U	0.36 U	0.004 U	0.0057 U	0.3 U	0.0044 U	0.0037 U	0.0039 U	0.005 U	0.31 U	0.0058 U
Bromomethane	--	--	--	MG/KG	0.12 U	0.0039 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
Carbon Disulfide	--	--	--	MG/KG	0.58 U	0.02 U	0.02 U	0.9 U	0.01 U	0.014 U	0.76 U	0.011 U	0.0094 U	0.0098 U	0.012 U	0.78 U	0.014 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.058 U	0.1 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
Chloroethane	--	--	--	MG/KG	0.12 U	0.2 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
Chloroform	0.37	49	0.37	MG/KG	0.087 U	0.0029 U	0.003 U	0.14 U	0.0015 U	0.0021 U	0.11 U	0.0016 U	0.0014 U	0.0015 U	0.0019 U	0.12 U	0.0022 U
Chloromethane	--	--	--	MG/KG	0.23 U	0.0078 U	0.0079 U	0.36 U	0.004 U	0.0057 U	0.3 U	0.0044 U	0.0037 U	0.0039 U	0.005 U	0.31 U	0.0058 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.058 U	0.001 J	0.002 U	0.035 J	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
Cymene	--	--	--	MG/KG	0.014 J	0.002 U	0.002 U	0.033 J	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
Dibromochloromethane	--	--	--	MG/KG	0.058 U	0.1 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U

Table 3. Summary of Volatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	SB-8	SB-9	SB-9	SB-10	SB-10	SB-11	SB-11	SB-12	SB-12	SB-13	SB-13	SB-14	SB-14
Sample Date:					12/10/2019	12/09/2019	12/09/2019	12/11/2019	12/11/2019	12/11/2019	12/11/2019	01/13/2020	01/13/2020	01/13/2020	01/13/2020	01/13/2020	01/13/2020
Sample Depth (ft bls):					4 - 6	2 - 4	5 - 7	3 - 5	5 - 7	3 - 5	5 - 7	0 - 2	11 - 13	0 - 2	6 - 8	7 - 9	0 - 2
Normal or Field Duplicate:					N	N	N	N	N	N	N	N	N	N	N	N	N
Dibromomethane	--	--	--	MG/KG	0.12 U	0.0039 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.58 U	0.02 U	0.02 U	0.9 U	0.01 U	0.014 U	0.76 U	0.011 U	0.0094 U	0.0098 U	0.012 U	0.78 U	0.014 U
Dichloroethylenes	--	--	--	MG/KG	0.058 U	0.001 J	0.002 U	0.035 J	0.00018 J	0.00096 J	0.076 U	0.0011 U	0.00014 J	0.00015 J	0.00018 J	0.078 U	0.00023 J
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.12 U	0.0039 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
Ethylbenzene	1	41	1	MG/KG	0.058 U	0.0003 J	0.002 U	0.03 J	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.033 J	0.0014 U
Hexachlorobutadiene	--	--	--	MG/KG	0.23 U	0.0078 U	0.0079 U	0.36 U	0.004 U	0.0057 U	0.3 U	0.0044 U	0.0037 U	0.0039 U	0.005 U	0.31 U	0.0058 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.058 U	0.1 U	0.002 U	0.18	0.00017 J	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.017 J	0.0014 U
m,p-Xylene	--	--	--	MG/KG	0.12 U	0.056 J	0.0039 U	0.063 J	0.002 U	0.0028 U	0.072 J	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.14 J	0.0029 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.58 U	1 U	0.0096 J	0.9 U	0.01 U	0.014 U	0.76 U	0.011 U	0.0094 U	0.0098 U	0.012 U	0.78 U	0.014 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.58 U	0.02 U	0.02 U	0.9 U	0.01 U	0.014 U	0.76 U	0.011 U	0.0094 U	0.0098 U	0.012 U	0.33 J	0.014 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.29 U	0.5 U	0.0099 U	0.45 U	0.005 U	0.0071 U	0.38 U	0.0055 U	0.0047 U	0.0049 U	0.0063 U	0.39 U	0.0072 U
Naphthalene	**12**	100	12	MG/KG	0.46	0.4 U	0.0079 U	2.1	0.0026 J	0.0016 J	0.12 J	0.0044 U	0.0037 U	0.0039 U	0.005 U	0.34	0.0058 U
N-Butylbenzene	12	100	12	MG/KG	0.058 U	0.1 U	0.002 U	0.29	0.0002 J	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
N-Propylbenzene	**3.9**	100	3.9	MG/KG	0.058 U	0.002 U	0.002 U	0.36	0.0002 J	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.028 J	0.0014 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.058 U	0.00074 J	0.002 U	0.035 J	0.001 U	0.0014 U	0.023 J	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.04 J	0.0014 U
Sec-Butylbenzene	11	100	11	MG/KG	0.058 U	0.1 U	0.002 U	0.28	0.00027 J	0.0014 U	0.016 J	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.093	0.0014 U
Styrene	--	--	--	MG/KG	0.058 U	0.002 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.12 U	0.2 U	0.0039 U	0.045 J	0.00015 J	0.0028 U	0.019 J	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.073 J	0.0029 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.12 U	0.0039 U	0.0039 U	0.18 U	0.002 U	0.0028 U	0.15 U	0.0022 U	0.0019 U	0.002 U	0.0025 U	0.16 U	0.0029 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.029 U	0.062 J	0.00099 U	0.034 J	0.0005 U	0.00071 U	0.038 U	0.00047 J	0.00047 U	0.00049 U	0.00078	0.039 U	0.00072 U
Toluene	0.7	100	0.7	MG/KG	0.058 U	0.093 J	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.087 U	0.0029 U	0.003 U	0.14 U	0.00018 J	0.00096 J	0.11 U	0.0016 U	0.00014 J	0.00015 J	0.00018 J	0.12 U	0.00023 J
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.058 U	0.002 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.29 U	0.5 U	0.0099 U	0.45 U	0.005 U	0.0071 U	0.38 U	0.0055 U	0.0047 U	0.0049 U	0.0063 U	0.39 U	0.0072 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.029 U	0.05 U	0.00099 U	0.045 U	0.0005 U	0.00071 U	0.038 U	0.00055 U	0.00047 U	0.00049 U	0.00063 U	0.039 U	0.00072 U
Trichlorofluoromethane	--	--	--	MG/KG	0.23 U	0.4 U	0.0079 U	0.36 U	0.004 U	0.0057 U	0.3 U	0.0044 U	0.0037 U	0.0039 U	0.005 U	0.31 U	0.0058 U
Vinyl Acetate	--	--	--	MG/KG	0.58 U	0.02 U	0.02 U	0.9 U	0.01 U	0.014 U	0.76 U	0.011 U	0.0094 U	0.0098 U	0.012 U	0.78 U	0.014 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.058 U	0.002 U	0.002 U	0.09 U	0.001 U	0.0014 U	0.076 U	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.078 U	0.0014 U
Xylenes	**0.26**	100	1.6	MG/KG	0.058 U	0.0038 J	0.002 U	0.098 J	0.001 U	0.0014 U	0.095 J	0.0011 U	0.00094 U	0.00098 U	0.0012 U	0.18 J	0.0014 U

Table 3. Summary of Volatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	SB-15 03/16/2020 0 - 2 N	SB-15 03/16/2020 5 - 7 N	SB-16 03/16/2020 0 - 2 N	SB-16 03/16/2020 3 - 5 N	SB-17 03/16/2020 0 - 2 N	SB-17 03/16/2020 4 - 6 N	SB-18 03/17/2020 4 - 6 N	SB-18 03/17/2020 0 - 2 N	SB-19 03/17/2020 0 - 2 N	SB-19 03/17/2020 4 - 6 N	SB-20 03/17/2020 0 - 2 N	SB-20 03/17/2020 0 - 2 FD	SB-20 03/17/2020 4 - 6 N
1,1,1,2-Tetrachloroethane	--	--	--	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 R	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 R	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
1,1-Dichloropropene	--	--	--	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
1,2,3-Trichloropropane	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
1,2,4,5-Tetramethylbenzene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.15	0.0037	12	0.0026 U	0.36	0.0031 U	0.00046 J	0.00028 J	0.42
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
1,2,4-Trimethylbenzene	3.6	52	3.6	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.058 J	0.0018 U	0.092 J	0.0026 U	0.3	0.0031 U	0.0026 U	0.0026 U	0.045 J
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0034 U	0.0028 U	0.0046 U	0.0029 U	0.19 U	0.0028 U	0.24 U	0.0039 R	0.21 U	0.0047 U	0.0038 U	0.0038 U	0.26 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	8.4	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.017 J	0.0018 U	0.16 U	0.0026 U	0.15	0.0031 U	0.0026 U	0.0026 U	0.028 J
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
1,3-Dichloropropane	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
1,4-Diethyl Benzene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.04 J	0.00084 J	2.8	0.0026 U	0.081 J	0.0031 U	0.0026 U	0.0026 U	0.033 J
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.091 U	0.074 U	0.12 U	0.078 U	5.2 U	0.074 U	6.5 U	0.1 U	5.5 U	0.12 U	0.1 U	0.1 U	7 U
2,2-Dichloropropane	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
2-Chlorotoluene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
2-Hexanone	--	--	--	MG/KG	0.011 U	0.0092 U	0.015 U	0.0098 U	0.65 U	0.0092 U	0.82 U	0.013 U	0.69 U	0.016 U	0.013 U	0.013 U	0.87 U
4-Chlorotoluene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
4-Ethyltoluene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.044 J	0.0018 U	0.046 J	0.0026 U	0.17	0.0031 U	0.0026 U	0.0026 U	0.17 U
Acetone	**0.05**	100	0.05	MG/KG	0.015	0.0089 J	0.015 J	0.0068 J	0.65 U	0.012	0.82 U	0.02 J	0.69 U	**0.092 J**	0.038 J	0.032 J	0.87 U
Acrylonitrile	--	--	--	MG/KG	0.0045 U	0.0037 U	0.0062 U	0.0039 U	0.26 U	0.0037 U	0.33 U	0.0052 U	0.28 U	0.0062 U	0.0051 U	0.0051 U	0.35 U
Benzene	0.06	4.8	0.06	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.019 J	0.00065 U	0.034 U	0.00046 J	0.00064 U	0.00064 U	0.044 U
Bromobenzene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
Bromochloromethane	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
Bromodichloromethane	--	--	--	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
Bromoform	--	--	--	MG/KG	0.0045 U	0.0037 U	0.0062 U	0.0039 U	0.26 U	0.0037 U	0.33 U	0.0052 U	0.28 U	0.0062 U	0.0051 U	0.0051 U	0.35 U
Bromomethane	--	--	--	MG/KG	0.0012 J	0.0009 J	0.0013 J	0.0014 J	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
Carbon Disulfide	--	--	--	MG/KG	0.011 U	0.0092 U	0.015 U	0.0098 U	0.65 U	0.0092 U	0.82 U	0.013 U	0.69 U	0.016 U	0.013 U	0.013 U	0.87 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
Chloroethane	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
Chloroform	0.37	49	0.37	MG/KG	0.0017 U	0.0014 U	0.0023 U	0.0015 U	0.097 U	0.0014 U	0.12 U	0.002 U	0.1 U	0.0023 U	0.0019 U	0.0019 U	0.13 U
Chloromethane	--	--	--	MG/KG	0.0045 U	0.0037 U	0.0062 U	0.0039 U	0.26 U	0.0037 U	0.33 U	0.0052 U	0.28 U	0.0062 U	0.0051 U	0.0051 U	0.35 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.00093 J	0.00092 U	0.0015 U	0.00098 U	0.054 J	0.00092 U	0.082 U	0.0013 U	0.021 J	0.0016 U	0.0013 U	0.0013 U	0.087 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
Cymene	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.062 J	0.0013 U	0.032 J	0.0016 U	0.0002 J	0.00015 J	0.061 J
Dibromochloromethane	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U

Table 3. Summary of Volatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	SB-15 03/16/2020 0 - 2 N	SB-15 03/16/2020 5 - 7 N	SB-16 03/16/2020 0 - 2 N	SB-16 03/16/2020 3 - 5 N	SB-17 03/16/2020 0 - 2 N	SB-17 03/16/2020 4 - 6 N	SB-18 03/17/2020 4 - 6 N	SB-18 03/17/2020 0 - 2 N	SB-19 03/17/2020 0 - 2 N	SB-19 03/17/2020 4 - 6 N	SB-20 03/17/2020 0 - 2 N	SB-20 03/17/2020 0 - 2 FD	SB-20 03/17/2020 4 - 6 N
Dibromomethane	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.011 U	0.0092 U	0.015 U	0.0098 U	0.65 U	0.0092 U	0.82 U	0.013 U	0.69 U	0.016 U	0.013 U	0.013 U	0.87 U
Dichloroethylenes	--	--	--	MG/KG	0.00093 J	0.00092 U	0.0015 U	0.00098 U	0.054 J	0.00092 U	0.082 U	0.0013 U	0.021 J	0.0016 U	0.0013 U	0.0013 U	0.087 U
Diethyl Ether (Ethyl Ether)	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
Ethylbenzene	1	41	1	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.012 J	0.00092 U	0.082 U	0.0013 U	0.059 J	0.0016 U	0.0013 U	0.0013 U	0.012 J
Hexachlorobutadiene	--	--	--	MG/KG	0.0045 U	0.0037 U	0.0062 U	0.0039 U	0.26 U	0.0037 U	0.33 U	0.0052 U	0.28 U	0.0062 U	0.0051 U	0.0051 U	0.35 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.022 J	0.0003 J	3.6	0.0013 U	0.04 J	0.0016 U	0.0013 U	0.0013 U	0.087 U
m,p-Xylene	--	--	--	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.053 J	0.0026 U	0.095 J	0.0031 U	0.0026 U	0.0026 U	0.055 J
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.011 U	0.0092 U	0.015 U	0.0098 U	0.65 U	0.0092 U	0.82 U	0.013 U	0.69 U	0.013 J	0.013 U	0.013 U	0.87 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.011 U	0.0092 U	0.015 U	0.0098 U	0.65 U	0.0092 U	0.82 U	0.013 U	0.69 U	0.016 U	0.013 U	0.013 U	0.87 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0057 U	0.0046 U	0.0077 U	0.0049 U	0.32 U	0.0046 U	0.41 U	0.0065 U	0.34 U	0.0078 U	0.0064 U	0.0064 U	0.44 U
Naphthalene	**12**	100	12	MG/KG	0.0045 U	0.0037 U	0.0062 U	0.0014 J	0.055 J	0.0037 U	0.39	0.0052 U	0.25 J	0.0062 U	0.0047 J	0.0022 J	0.11 J
N-Butylbenzene	12	100	12	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.031 J	0.00025 J	3.6	0.0013 U	0.086	0.0016 U	0.0013 U	0.0013 U	0.087 U
N-Propylbenzene	**3.9**	100	3.9	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.059 J	0.00044 J	**7.3**	0.0013 U	0.2	0.0016 U	0.0013 U	0.0013 U	0.087 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.034 J	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
Sec-Butylbenzene	11	100	11	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.022 J	0.00056 J	3	0.0013 U	0.055 J	0.0016 U	0.0013 U	0.0013 U	0.03 J
Styrene	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
T-Butylbenzene	5.9	100	5.9	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.00016 J	0.45	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.023 J
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0023 U	0.0018 U	0.0031 U	0.002 U	0.13 U	0.0018 U	0.16 U	0.0026 U	0.14 U	0.0031 U	0.0026 U	0.0026 U	0.17 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0043	0.00035 J	0.00077 U	0.00049 U	0.019 J	0.00046 U	0.041 U	0.0052 J	0.11	0.00078 U	0.00042 J	0.00064 U	0.044 U
Toluene	0.7	100	0.7	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.057 J	0.00092 U	0.082 U	0.0013 U	0.05 J	0.0016 U	0.0013 U	0.0013 U	0.087 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	--	MG/KG	0.00057 U	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0017 U	0.0014 U	0.0023 U	0.0015 U	0.097 U	0.0014 U	0.12 U	0.002 U	0.1 U	0.0023 U	0.0019 U	0.0019 U	0.13 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
Trans-1,4-Dichloro-2-Butene	--	--	--	MG/KG	0.0057 U	0.0046 U	0.0077 U	0.0049 U	0.32 U	0.0046 U	0.41 U	0.0065 U	0.34 U	0.0078 U	0.0064 U	0.0064 U	0.44 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00026 J	0.00046 U	0.00077 U	0.00049 U	0.032 U	0.00046 U	0.041 U	0.00065 U	0.034 U	0.00078 U	0.00064 U	0.00064 U	0.044 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0045 U	0.0037 U	0.0062 U	0.0039 U	0.26 U	0.0037 U	0.33 U	0.0052 U	0.28 U	0.0062 U	0.0051 U	0.0051 U	0.35 U
Vinyl Acetate	--	--	--	MG/KG	0.011 U	0.0092 U	0.015 U	0.0098 U	0.65 U	0.0092 U	0.82 U	0.013 R	0.69 U	0.016 U	0.013 U	0.013 U	0.87 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.082 U	0.0013 U	0.069 U	0.0016 U	0.0013 U	0.0013 U	0.087 U
Xylenes	**0.26**	100	1.6	MG/KG	0.0011 U	0.00092 U	0.0015 U	0.00098 U	0.065 U	0.00092 U	0.087 J	0.0013 U	0.095 J	0.0016 U	0.0013 U	0.0013 U	0.055 J

Table 4. Summary of Semivolatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

			Sample Designation:	SB-15	SB-15	SB-16	SB-16	SB-17	SB-17	SB-18	SB-18	SB-19	SB-19	SB-20	SB-20	SB-20
			Sample Date:	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020
			Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2	3 - 5	0 - 2	4 - 6	4 - 6	0 - 2	0 - 2	4 - 6	0 - 2	0 - 2	4 - 6
			Normal or Field Duplicate:	N	N	N	N	N	N	N	N	N	N	N	FD	N
Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units													
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.028 U	0.027 U	0.03 U	0.028 U	0.029 U	0.029 U	0.32 U	0.28 U	0.28 U	0.032 U	0.28 U	0.28 U	0.031 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.19 U	0.18 U	0.2 R	0.19 U	0.19 R	0.2 U	2.1 U	1.8 R	1.9 R	0.21 U	1.9 R	1.8 R	0.2 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.11 U	0.11 U	0.12 R	0.11 U	0.12 R	0.12 U	1.3 U	1.1 R	1.1 R	0.13 U	1.1 R	1.1 R	0.12 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.17 U	0.16 U	0.18 R	0.17 U	0.17 R	0.18 U	1.9 U	1.7 R	1.7 R	0.19 U	1.7 R	1.7 R	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.19 U	0.18 U	0.2 R	0.19 U	0.19 R	0.2 U	2.1 U	1.8 R	1.9 R	0.21 U	1.9 R	1.8 R	0.2 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.91 U	0.87 U	0.95 R	0.91 U	0.92 R	0.94 U	10 U	8.9 R	9 R	1 U	9 R	8.9 R	0.98 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
2-Chloronaphthalene	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
2-Chlorophenol	--	--	--	MG/KG	0.19 U	0.18 U	0.2 R	0.19 U	0.19 R	0.2 U	2.1 U	1.8 R	1.9 R	0.21 U	1.9 R	1.8 R	0.2 U
2-Methylnaphthalene	--	--	--	MG/KG	0.038 J	0.22 U	0.044 J	0.092 J	0.19 J	0.23 U	14	2.2 U	0.74 J	0.25 U	0.28 J	2.2 U	0.41
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.19 U	0.18 U	0.2 R	0.19 U	0.19 R	0.2 U	2.1 U	1.8 R	1.9 R	0.21 U	1.9 R	1.8 R	0.032 J
2-Nitroaniline	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
2-Nitrophenol	--	--	--	MG/KG	0.41 U	0.39 U	0.43 R	0.41 U	0.41 R	0.42 U	4.6 U	4 R	4 R	0.45 U	4 R	4 R	0.44 U
3- And 4- Methylphenol (Total)	0.33	100	0.33	MG/KG	0.27 U	0.26 U	0.28 R	0.27 U	0.28 R	0.28 U	3 U	2.7 R	2.7 R	0.3 U	2.7 R	2.7 R	0.1 J
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
3-Nitroaniline	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.5 U	0.47 U	0.52 U	0.49 U	0.5 U	0.51 U	5.5 U	4.8 U	4.8 U	0.55 U	4.9 U	4.8 U	0.53 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
4-Chloroaniline	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
4-Nitroaniline	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
4-Nitrophenol	--	--	--	MG/KG	0.27 U	0.25 U	0.28 R	0.26 U	0.27 R	0.27 U	3 U	2.6 R	2.6 R	0.29 U	2.6 R	2.6 R	0.29 U
Acenaphthene	20	100	98	MG/KG	0.052 J	0.14 U	0.11 J	2.1	0.3	0.071 J	3.6	1.5 U	0.47 J	0.054 J	0.24 J	0.21 J	1.1
Acenaphthylene	100	100	107	MG/KG	0.029 J	0.14 U	0.48	0.038 J	0.066 J	0.16 U	1 J	1.5 U	1.5 U	0.17 U	1.5 U	1.5 U	0.21
Acetophenone	--	--	--	MG/KG	0.19 U	0.18 U	0.028 J	0.19 U	0.04 J	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Anthracene	100	100	1000	MG/KG	0.054 J	0.11 U	0.74	0.15	0.24	0.12 U	3.2	0.46 J	0.72 J	0.089 J	0.39 J	1.1 U	1.6
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.15	0.11 U	**2.6**	0.32	0.56	0.068 J	**10**	**1.2**	**1.9**	0.14	**1.1**	0.95 J	**3.5**
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.14 J	0.14 U	**2.4**	0.2	0.42	0.16 U	**18**	**1.2 J**	**1.8**	0.12 J	**1.2 J**	0.94 J	**4.1**
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.18	0.11 U	**3.1**	0.26	0.6	0.055 J	**17**	**1.2**	**2.2**	0.14	**1.5**	**1.3**	**4.4**
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.088 J	0.14 U	1.5	0.11 J	0.21	0.023 J	14	1.1 J	0.97 J	0.064 J	0.7 J	0.6 J	2.7
Benzo(K)Fluoranthene	**0.8**	3.9	1.7	MG/KG	0.056 J	0.11 U	**1.1**	0.091 J	0.18	0.12 U	**5.1**	0.45 J	0.73 J	0.045 J	0.52 J	0.41 J	**1.2**
Benzoic Acid	--	--	--	MG/KG	0.62 U	0.59 U	0.64 U	0.61 U	0.62 U	0.63 U	6.9 U	6 U	6 U	0.68 U	6.1 U	6 U	0.66 U
Benzyl Alcohol	--	--	--	MG/KG	0.19 U	0.18 U	0.065 J	0.19 U	0.28	0.2 U	2.1 U	4.6	0.71 J	0.21 U	1.9 U	1.8 U	0.2 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.43 U	0.41 U	0.45 U	0.43 U	0.44 U	0.44 U	4.8 U	4.2 U	4.2 U	0.48 U	4.3 U	4.2 U	0.13 J
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.2 U	0.2 U	0.03 J	0.2 U	0.21 U	0.21 U	2.3 U	2 U	2 U	0.23 U	2 U	2 U	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.17 U	0.16 U	0.18 U	0.17 U	0.17 U	0.18 U	1.9 U	1.7 U	1.7 U	0.19 U	1.7 U	1.7 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.23 U	0.22 U	0.24 U	0.23 U	0.23 U	0.23 U	2.5 U	2.2 U	2.2 U	0.25 U	2.2 U	2.2 U	0.25 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.067 J	0.18 U	0.2 U	0.19 U	0.28	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Carbazole	--	--	--	MG/KG	0.025 J	0.18 U	0.2	0.081 J	0.039 J	0.2 U	0.9 J	1.8 U	0.18 J	0.034 J	0.19 J	0.18 J	0.93

Table 4. Summary of Semivolatile Organic Compounds in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	Sample Designation:	SB-15	SB-16	SB-16	SB-17	SB-17	SB-18	SB-18	SB-19	SB-19	SB-20	SB-20	SB-20
					Sample Date:	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020
					Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2	3 - 5	0 - 2	4 - 6	4 - 6	0 - 2	0 - 2	4 - 6	0 - 2	0 - 2	4 - 6
					Normal or Field Duplicate:	N	N	N	N	N	N	N	N	N	N	N	FD	N
Chrysene	**1**	3.9	1	MG/KG		0.14	0.11 U	**2.4**	0.31	0.55	0.068 J	**9.5**	**1.1**	**1.7**	0.12 J	**1.2**	1 J	**3.6**
Dibenz(A,H)Anthracene	**0.33**	0.33	1000	MG/KG		0.11 U	0.11 U	**0.35**	0.11 U	0.052 J	0.12 U	**2.9**	1.1 U	0.26 J	0.13 U	1.1 U	1.1 U	**0.66**
Dibenzofuran	7	59	210	MG/KG		0.026 J	0.18 U	0.074 J	0.12 J	0.22	0.2 U	2.1	1.8 U	0.31 J	0.028 J	1.9 U	1.8 U	0.77
Diethyl Phthalate	--	--	--	MG/KG		0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Dimethyl Phthalate	--	--	--	MG/KG		0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Di-N-Butyl Phthalate	--	--	--	MG/KG		0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Di-N-Octylphthalate	--	--	--	MG/KG		0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Fluoranthene	100	100	1000	MG/KG		0.27	0.11 U	4.5	0.93	1.5	0.1 J	14	2.2	3.5	0.29	2.5	2.3	8.2
Fluorene	30	100	386	MG/KG		0.034 J	0.18 U	0.13 J	0.29	0.23	0.036 J	3.3	1.8 U	0.41 J	0.054 J	0.18 J	1.8 U	0.99
Hexachlorobenzene	0.33	1.2	3.2	MG/KG		0.11 U	0.11 U	0.12 U	0.11 U	0.12 U	0.12 U	1.3 U	1.1 U	1.1 U	0.13 U	1.1 U	1.1 U	0.12 U
Hexachlorobutadiene	--	--	--	MG/KG		0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
Hexachlorocyclopentadiene	--	--	--	MG/KG		0.54 U	0.52 U	0.57 U	0.54 U	0.55 U	0.56 U	6 U	5.3 U	5.3 U	0.6 U	5.4 U	5.3 U	0.59 U
Hexachloroethane	--	--	--	MG/KG		0.15 U	0.14 U	0.16 U	0.15 U	0.15 U	0.16 U	1.7 U	1.5 U	1.5 U	0.17 U	1.5 U	1.5 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG		0.088 J	0.14 U	**1.5**	0.1 J	0.23	0.16 U	**12**	**0.73 J**	**1 J**	0.063 J	**0.74 J**	**0.65 J**	**2.6**
Isophorone	--	--	--	MG/KG		0.17 U	0.16 U	0.18 U	0.17 U	0.17 U	0.18 U	1.9 U	1.7 U	1.7 U	0.19 U	1.7 U	1.7 U	0.18 U
Naphthalene	12	100	12	MG/KG		0.078 J	0.18 U	0.085 J	0.36	0.35	0.2 U	2.6	1.8 U	0.72 J	0.21 U	1.9 U	1.8 U	1.2
Nitrobenzene	--	--	--	MG/KG		0.17 U	0.16 U	0.18 U	0.17 U	0.17 U	0.18 U	1.9 U	1.7 U	1.7 U	0.19 U	1.7 U	1.7 U	0.18 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG		0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.2 U	2.1 U	1.8 U	1.9 U	0.21 U	1.9 U	1.8 U	0.2 U
N-Nitrosodiphenylamine	--	--	--	MG/KG		0.15 U	0.14 U	0.16 U	0.15 U	0.15 U	0.16 U	1.7 U	1.5 U	1.5 U	0.17 U	1.5 U	1.5 U	0.16 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG		0.15 U	0.14 U	0.16 R	0.15 U	0.15 R	0.16 U	1.7 U	1.5 R	1.5 R	0.17 U	1.5 R	1.5 R	0.16 U
Phenanthrene	100	100	1000	MG/KG		0.13	0.11 U	1.6	0.26	0.76	0.058 J	15	1.9	2.6	0.31	1.8	1.7	8.2
Phenol	0.33	100	0.33	MG/KG		0.19 U	0.18 U	0.2 R	0.19 U	0.15 J	0.2 U	2.1 U	1.8 R	1.9 R	0.21 U	1.9 R	1.8 R	0.2 U
Pyrene	100	100	1000	MG/KG		0.33	0.11 U	3.7	1.2	1.4	0.087 J	14	2	3.2	0.25	2.2	2	7.3

Table 5. Summary of Metals in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units	SB-15 03/16/2020 0 - 2 N	SB-15 03/16/2020 5 - 7 N	SB-16 03/16/2020 0 - 2 N	SB-16 03/16/2020 3 - 5 N	SB-17 03/16/2020 0 - 2 N	SB-17 03/16/2020 4 - 6 N	SB-18 03/17/2020 4 - 6 N	SB-18 03/17/2020 0 - 2 N	SB-19 03/17/2020 0 - 2 N	SB-19 03/17/2020 4 - 6 N	SB-20 03/17/2020 0 - 2 N	SB-20 03/17/2020 0 - 2 FD	SB-20 03/17/2020 4 - 6 N
Aluminum	--	--	--	MG/KG	6580	5540	5470	5040	6430	5290	3080	3880	4770	3070	3720	5400	2920
Antimony	--	--	--	MG/KG	4.34 U	4.36 U	4.66 U	4.58 U	4.4 U	4.7 U	2.92 J	1.05 J	1.34 J	0.588 J	1.14 J	0.856 J	11
Arsenic	**13**	16	16	MG/KG	2.84	1.82	6.2	1.84	2.98	1.13	12.2	5.05	6.23	**25.7**	4.77	5.24	**21.3**
Barium	350	400	820	MG/KG	176	34.4	116	38.4	125	31.4	127	57.1	142	21	38.2	56.4	163
Beryllium	7.2	72	47	MG/KG	3.74	0.044 J	0.326 J	0.092 J	1.94	0.122 J	0.246 J	0.184 J	0.488	0.172 J	0.167 J	0.353 J	0.215 J
Cadmium	**2.5**	4.3	7.5	MG/KG	0.6 J	0.183 J	0.438 J	0.156 J	0.467 J	0.15 J	**2.78**	0.709 J	0.235 J	0.274 J	0.097 J	0.106 J	**10.9**
Calcium	--	--	--	MG/KG	13900	703	70600	3160	15400	1280	16200	45300 J	41900	4110	49300	62800	12700
Chromium III	**30**	180	--	MG/KG	**54**	12	**35**	11	**40**	13	20 J	24 J	**33 J**	8.9 J	17	22	**34 J**
Chromium, Hexavalent	**1**	110	19	MG/KG	0.916 U	0.896 U	**1.55 J**	0.918 U	0.938 U	0.942 U	0.876 J	0.399 J	0.412 J	0.381 J	**1.51**	**1.29**	0.796 J
Chromium, Total	**30**	180	--	MG/KG	**53.9**	12.4	**36.9**	11.1	**39.6**	13.4	20.4	24.2 J	**33.9**	9.26	18.8	22.9	**35.3**
Cobalt	--	--	--	MG/KG	31.9	4.76	5.82	4.07	18.8	4.26	3.78	3.46	7.13	3.18	2.86	3.93	4.67
Copper	**50**	270	1720	MG/KG	**880**	11	**82.8**	14	**468**	10.8	**86.2**	27.1 J	**104**	20.7	20.8	44.5	**153**
Cyanide	27	27	40	MG/KG	1 U	1 U	1.2 U	0.36 J	1.1 U	1.1 U	10 J	2 J	0.81 J	1.2 U	0.49 J	0.76 J	13 J
Iron	--	--	--	MG/KG	28100	10200	12500	8480	20500	9590	13500	6890	12800	6490	5550	7760	22500
Lead	**63**	400	450	MG/KG	**861**	4.78	**216**	55.8	**461**	8.4	**596**	49.8 J	**213**	57.4	28	57.9	**2780**
Magnesium	--	--	--	MG/KG	2920	1830	14000	1500	2460	1510	1140	3400 J	3480	1720	5390	6330	1390
Manganese	1600	2000	2000	MG/KG	364	211	266	220	295	158	237	169 J	226	148	131	172	350
Mercury	**0.18**	0.81	0.73	MG/KG	0.078 U	0.078 U	0.114	0.074 U	0.063 J	0.078 U	**0.252**	0.1	**0.213**	0.089 U	**0.408**	0.068 J	**0.531**
Nickel	**30**	310	130	MG/KG	**110**	8.12	16.8	7.93	**59.1**	8.28	11.6	12.3	21.6	8.68	6.96	10.6	10.2
Potassium	--	--	--	MG/KG	986	640	680	491	816	585	474	360	850	532	354	518	358
Selenium	3.9	180	4	MG/KG	1.74 U	1.74 U	1.87 U	0.357 J	1.76 U	1.88 U	0.621 J	0.464 J	0.705 J	2 J	0.458 J	1.76 U	0.8 J
Silver	2	180	8.3	MG/KG	0.434 J	0.871 U	0.933 U	0.916 U	0.881 U	0.941 U	0.986 U	0.876 U	0.575 J	1.01 U	0.881 U	0.883 U	0.976 U
Sodium	--	--	--	MG/KG	562	163 J	247	125 J	406	125 J	185 J	142 J	348	526	156 J	298	160 J
Thallium	--	--	--	MG/KG	1.74 U	1.74 U	1.87 U	1.83 U	1.76 U	1.88 U	1.97 U	1.75 U	1.74 U	2.03 U	1.76 U	1.76 U	1.95 U
Vanadium	--	--	--	MG/KG	21	19	35.9	15.1	26.4	17.2	13.9	19.8	35.8	12.4	14.6	17.9	19
Zinc	**109**	10000	2480	MG/KG	**6080**	21.9	**495**	32.5	**3360**	24	**2170**	**154 J**	**544**	**176**	57.2	**213**	**9440**

Table 6. Summary of Polychlorinated Biphenyls in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

			Sample Designation:		SB-15	SB-15	SB-16	SB-16	SB-17	SB-17	SB-18	SB-18	SB-19	SB-19	SB-20	SB-20	SB-20
			Sample Date:		03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020
			Sample Depth (ft bls):		0 - 2	5 - 7	0 - 2	3 - 5	0 - 2	4 - 6	4 - 6	0 - 2	0 - 2	4 - 6	0 - 2	4 - 6	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	FD
Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units													
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0376 U	0.0408 U	0.0357 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0376 U	0.0408 U	0.0357 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0376 U	0.0408 U	0.0357 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0376 U	0.0408 U	0.0357 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0376 U	0.0408 U	0.0357 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.00402 J	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0376 U	0.0408 U	0.0357 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0218 J	0.0408 U	0.0357 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0376 U	0.0408 U	0.0357 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.0362 U	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.013 J	0.0408 U	0.0357 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.00402 J	0.036 U	0.0378 U	0.0364 U	0.037 U	0.0378 U	0.0427 U	0.0359 U	0.0368 U	0.0408 U	0.0348 J	0.0408 U	0.0357 U

Table 7. Summary of Pesticides and Herbicides in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

			Sample Designation:		SB-15	SB-15	SB-16	SB-16	SB-17	SB-17	SB-18	SB-18	SB-19	SB-19	SB-20	SB-20	SB-20
			Sample Date:		03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020
			Sample Depth (ft bls):		0 - 2	5 - 7	0 - 2	3 - 5	0 - 2	4 - 6	4 - 6	0 - 2	0 - 2	4 - 6	0 - 2	0 - 2	4 - 6
			Normal or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	FD	N
Parameters	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Units													
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.186 U	0.185 U	0.195 U	0.189 U	0.192 U	0.19 U	0.21 U	0.187 U	0.187 U	0.21 U	0.189 U	0.185 U	0.204 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.186 U	0.185 U	0.195 U	0.189 U	0.192 U	0.19 U	0.21 U	0.187 U	0.187 U	0.21 U	0.189 U	0.185 U	0.204 U
Aldrin	**0.005**	0.097	0.19	MG/KG	0.00175 U	0.00174 U	0.00188 U	0.0018 U	0.00185 U	0.00179 U	0.00194 U	0.00173 U	0.00176 U	0.00531 U	**0.0123**	**0.0128**	0.00196 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.000731 U	0.000726 U	0.000786 U	0.000751 U	0.000771 U	0.000746 U	0.000808 U	0.00072 U	0.000734 U	0.00221 U	0.000723 U	0.000724 U	0.000818 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.00175 U	0.00174 U	0.00188 U	0.0018 U	0.00185 U	0.00179 U	0.00194 U	0.00173 U	0.00176 U	0.00531 U	0.00173 U	0.00174 U	0.00196 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.00175 U	0.00174 U	0.00188 U	0.0018 U	0.00185 U	0.00179 U	0.00194 U	0.00173 U	0.00176 U	0.00531 U	0.00173 U	0.00174 U	0.00196 U
Beta Endosulfan	2.4	24	102	MG/KG	0.00175 U	0.00174 U	0.00188 U	0.0018 U	0.00185 U	0.00179 U	0.00194 U	0.00173 U	0.00176 U	0.00531 U	0.00173 U	0.00174 U	0.00196 U
Chlordane	--	--	--	MG/KG	0.0146 U	0.0145 U	0.231	0.015 U	0.0154 U	0.0149 U	0.0162 U	0.486	0.31	0.0442 U	1	1	0.0164 U
cis-Chlordane	**0.094**	4.2	2.9	MG/KG	0.00219 U	0.00218 U	0.0136 J	0.00225 U	0.00231 U	0.00224 U	0.00242 U	0.0303	0.0181 J	0.00663 U	**0.108**	**0.106**	0.00245 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.00175 U	0.00174 U	0.00188 U	0.0018 U	0.00185 U	0.00179 U	0.00194 U	0.00173 U	0.00176 U	0.00531 U	0.00173 U	0.00174 U	0.00196 U
Dieldrin	**0.005**	0.2	0.1	MG/KG	0.00351	0.00109 U	0.00225	0.00113 U	0.00116 U	0.00112 U	0.00121 U	0.00214	0.00262	0.00332 U	**0.0209**	**0.0221**	0.00123 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.000731 U	0.000726 U	0.000786 U	0.000751 U	0.000771 U	0.000746 U	0.000808 U	0.00072 U	0.000734 U	0.00221 U	0.000723 U	0.000724 U	0.000818 U
Endrin	0.014	11	0.06	MG/KG	0.000731 U	0.000726 U	0.000786 U	0.000751 U	0.000771 U	0.000746 U	0.000808 U	0.00072 U	0.000734 U	0.00221 U	0.000723 U	0.000724 U	0.000818 U
Endrin Aldehyde	--	--	--	MG/KG	0.00219 U	0.00218 U	0.00236 U	0.00225 U	0.00231 U	0.00224 U	0.00242 U	0.00216 U	0.00428	0.00663 U	0.00217 U	0.00217 U	0.00245 U
Endrin Ketone	--	--	--	MG/KG	0.00175 U	0.00174 U	0.00188 U	0.0018 U	0.00185 U	0.00179 U	0.00194 U	0.00173 U	0.00176 U	0.00531 U	0.00173 U	0.00174 U	0.00196 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.000731 U	0.000726 U	0.000786 U	0.000751 U	0.000771 U	0.000746 U	0.000808 U	0.00072 U	0.000734 U	0.00221 U	0.000723 U	0.000724 U	0.000818 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.000877 U	0.000871 U	0.00409	0.000901 U	0.000925 U	0.000896 U	0.00097 U	0.00847	0.0063	0.00265 U	0.0218	0.022	0.000981 U
Heptachlor Epoxide	--	--	--	MG/KG	0.00329 U	0.00326 U	0.00354 U	0.00338 U	0.00347 U	0.00336 U	0.00364 U	0.00144 J	0.0033 U	0.00995 U	0.00441 J	0.00371 J	0.00368 U
Methoxychlor	--	--	--	MG/KG	0.00329 U	0.00326 U	0.00354 U	0.00338 U	0.00347 U	0.00336 U	0.00364 U	0.00324 U	0.0033 U	0.00995 U	0.00325 U	0.00326 U	0.00368 U
P,P'-DDD	0.0033	13	14	MG/KG	0.00092 J	0.00174 U	0.00188 U	0.0018 U	0.00185 U	0.00179 U	0.00194 U	0.00173 U	0.0026	0.00531 U	0.00173 U	0.00174 U	0.00196 U
P,P'-DDE	**0.0033**	8.9	17	MG/KG	**0.0104**	0.00174 U	**0.00414**	0.0018 U	**0.00708**	0.00179 U	0.00194 U	**0.00642**	**0.0124**	0.00531 U	**0.0159**	**0.0168**	0.00196 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.00224 J	0.00326 U	0.00354 U	0.00338 U	0.00347 U	0.00336 U	0.00364 U	0.00324 U	**0.00431 J**	0.00995 U	0.00249 J	0.00263 J	0.00368 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.186 U	0.185 U	0.195 U	0.189 U	0.192 U	0.19 U	0.21 U	0.187 U	0.187 U	0.21 U	0.189 U	0.185 U	0.204 U
Toxaphene	--	--	--	MG/KG	0.0329 U	0.0326 U	0.0354 U	0.0338 U	0.0347 U	0.0336 U	0.0364 U	0.0324 U	0.033 U	0.0995 U	0.0325 U	0.0326 U	0.0368 U
trans-Chlordane	--	--	--	MG/KG	0.00219 U	0.00218 U	0.0219	0.00225 U	0.00231 U	0.00224 U	0.00242 U	0.0389	0.0289	0.00663 U	0.0953	0.093	0.00245 U

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Soil, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		SB-15	SB-15	SB-16	SB-16	SB-17	SB-17	SB-18	SB-18	SB-19	SB-19	SB-20	SB-20	SB-20
Sample Date:		03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020
Sample Depth (ft bls):		0 - 2	5 - 7	0 - 2	3 - 5	0 - 2	4 - 6	4 - 6	0 - 2	0 - 2	4 - 6	0 - 2	0 - 2	4 - 6
Normal or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	FD	N
Parameters	Units													
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.258 U	0.234 U	0.217 U	0.227 U	0.226 U	0.201 U	0.235 U	0.214 U	0.217 U	0.368 U	0.214 U	0.2 U	0.269 U
N-Ethyl-N-((heptadecafluorooctyl)sulphonyl) glycine	UG/KG	0.108 U	0.098 U	0.091 U	0.095 U	0.095 U	0.084 U	0.099 U	0.09 U	**0.448 J**	0.154 U	**0.167 J**	0.084 U	0.113 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.05 U	0.045 U	0.042 U	0.044 U	0.044 U	0.039 U	0.046 U	0.041 U	0.042 U	0.071 U	0.041 U	0.039 U	0.052 U
Perfluorobutanoic Acid	UG/KG	**0.033 J**	0.026 U	**0.031 J**	0.026 U	0.025 U	0.023 U	0.027 U	0.024 U	**0.03 J**	0.042 U	**0.051 J**	**0.045 J**	0.03 U
Perfluorodecane Sulfonic Acid	UG/KG	0.196 U	0.178 U	**0.926 J**	0.172 U	0.171 U	0.153 U	0.179 U	**1.04 J**	**0.783 J**	0.28 U	**0.442 J**	**0.936 J**	0.204 U
Perfluorodecanoic acid (PFDA)	UG/KG	0.086 U	0.078 U	0.072 U	0.075 U	0.075 U	0.067 U	0.078 U	0.071 U	0.072 U	0.122 U	**0.072 J**	0.067 U	0.09 U
Perfluorododecanoic acid (PFDoA)	UG/KG	0.09 U	0.081 U	0.076 U	0.079 U	0.078 U	0.07 U	0.082 U	0.074 U	0.075 U	0.128 U	**0.075 J**	0.07 U	0.094 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.175 U	0.158 U	0.147 U	0.154 U	0.153 U	0.136 U	0.159 U	0.145 U	0.147 U	0.25 U	0.145 U	0.136 U	0.182 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	0.058 U	0.052 U	0.049 U	0.051 U	0.051 U	0.045 U	0.053 U	0.048 U	**0.056 J**	0.083 U	0.048 U	0.045 U	0.06 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.077 U	0.07 U	0.065 U	0.068 U	0.068 U	0.06 U	0.071 U	0.064 U	0.065 U	0.111 U	0.064 U	0.06 U	0.081 U
Perfluorohexanoic acid (PFHxA)	UG/KG	**0.092 J**	0.061 U	0.057 U	0.059 U	0.059 U	0.052 U	0.061 U	**0.061 J**	**0.116 J**	0.096 U	**0.131 J**	**0.136 J**	0.07 U
Perfluorononanoic acid (PFNA)	UG/KG	0.096 U	0.087 U	0.081 U	0.084 U	0.084 U	0.075 U	0.088 U	0.08 U	0.081 U	0.137 U	0.08 U	0.075 U	0.1 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.125 U	0.114 U	0.106 U	0.11 U	0.11 U	0.098 U	0.114 U	0.104 U	0.106 U	0.179 U	0.104 U	0.098 U	0.131 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**0.328 J**	**0.412 J**	**0.192 J**	0.146 U	0.146 U	**0.239 J**	0.152 U	0.138 U	**0.154 J**	0.238 U	**0.401 J**	**0.255 J**	0.174 U
Perfluorooctanoic acid (PFOA)	UG/KG	**0.119 J**	0.049 U	**0.062 J**	0.047 U	0.047 U	0.042 U	0.049 U	**0.112 J**	**0.134 J**	0.077 U	**0.124 J**	**0.114 J**	**0.058 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	**0.071 J**	0.053 U	0.05 U	0.052 U	0.052 U	0.046 U	0.054 U	0.049 U	**0.062 J**	0.084 U	**0.053 J**	**0.068 J**	0.062 U
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.069 U	0.063 U	0.058 U	0.061 U	0.061 U	0.054 U	0.063 U	0.057 U	0.058 U	0.099 U	**0.068 J**	0.054 U	0.072 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.262 U	0.238 U	0.221 U	0.23 U	0.229 U	0.204 U	0.239 U	0.217 U	0.22 U	0.374 U	0.217 U	0.203 U	0.273 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.06 U	0.054 U	0.051 U	0.053 U	0.052 U	0.047 U	0.055 U	0.05 U	0.05 U	0.086 U	**0.069 J**	**0.054 J**	0.063 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.367 U	0.333 U	0.31 U	0.323 U	0.322 U	0.287 U	0.335 U	0.304 U	0.309 U	0.525 U	0.304 U	0.285 U	0.384 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.23 U	0.208 U	0.194 U	0.202 U	0.201 U	0.179 U	0.21 U	0.19 U	0.193 U	0.328 U	0.19 U	0.178 U	0.24 U
TOTAL PFOA AND PFOS	UG/KG	**0.447 J**	**0.412 J**	**0.254 J**	0.047 U	0.047 U	**0.239 J**	0.049 U	**0.112 J**	**0.288 J**	0.077 U	**0.525 J**	**0.369 J**	**0.058 J**

Table 9. Summary of Volatile Organic Compounds in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

	Sample Designation:		TW-1	TW-1	TW-2	TW-3	TW-4	TW-4	TW-5	TW-5	TW-6	TW-6	TW-6	TW-7	TW-7	TW-8	TW-8
	Sample Date:		10/21/2019	10/21/2019	10/21/2019	12/11/2019	12/11/2019	03/16/2020	12/11/2019	03/16/2020	12/10/2019	12/10/2019	03/17/2020	12/10/2019	03/16/2020	12/10/2019	03/16/2020
	Normal or Field Duplicate:		N	FD	N	N	N	N	N	N	N	FD	N	N	N	N	N
Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units															
1,1,1,2-Tetrachloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,1,1-Trichloroethane (TCA)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,1,2,2-Tetrachloroethane	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
1,1,2-Trichloroethane	1	UG/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	3 U	1.5 U
1,1-Dichloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,1-Dichloroethene	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
1,1-Dichloropropene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,2,3-Trichlorobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,2,3-Trichloropropane	0.04	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,2,4,5-Tetramethylbenzene	**5**	UG/L	2 U	2 U	2 U	2 U	1.6 J	0.88 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	4 U	2 U
1,2,4-Trichlorobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,2,4-Trimethylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 J	0.99 J
1,2-Dibromo-3-Chloropropane	0.04	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	4 U	2 U
1,2-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,2-Dichloroethane	0.6	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
1,2-Dichloropropane	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
1,3,5-Trimethylbenzene (Mesitylene)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,3-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,3-Dichloropropane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,4-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
1,4-Diethyl Benzene	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	4 U	2 U
1,4-Dioxane (P-Dioxane)	--	UG/L	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	500 U	250 U
2,2-Dichloropropane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
2-Chlorotoluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
2-Hexanone	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U
4-Chlorotoluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
4-Ethyltoluene	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	4 U	2 U
Acetone	50	UG/L	5 U	1.5 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	1.5 J
Acrylonitrile	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Benzene	**1**	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J	0.21 J	0.5 U	0.5 U	0.5 U	1 U	0.32 J
Bromobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Bromochloromethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Bromodichloromethane	50	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
Bromoform	50	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	4 U	2 U
Bromomethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Carbon Disulfide	60	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Carbon Tetrachloride	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
Chlorobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Chloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Chloroform	7	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Chloromethane	--	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Cis-1,2-Dichloroethylene	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	**12**	**14**	**12**	3.1	3	5 U	2.5 U
Cis-1,3-Dichloropropene	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
Cymene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Dibromochloromethane	50	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
Dibromomethane	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Dichlorodifluoromethane	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U

Table 9. Summary of Volatile Organic Compounds in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

	Sample Designation:		TW-1	TW-1	TW-2	TW-3	TW-4	TW-4	TW-5	TW-5	TW-6	TW-6	TW-6	TW-7	TW-7	TW-8	TW-8
	Sample Date:		10/21/2019	10/21/2019	10/21/2019	12/11/2019	12/11/2019	03/16/2020	12/11/2019	03/16/2020	12/10/2019	12/10/2019	03/17/2020	12/10/2019	03/16/2020	12/10/2019	03/16/2020
	Normal or Field Duplicate:		N	FD	N	N	N	N	N	N	N	FD	N	N	N	N	N
Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units															
Dichloroethylenes	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	**12**	**14**	**12**	3.1	3	5 U	2.5 U
Diethyl Ether (Ethyl Ether)	--	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Ethylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	0.9 J
Hexachlorobutadiene	0.5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Isopropylbenzene (Cumene)	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
m,p-Xylene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2 J	0.92 J
Methyl Ethyl Ketone (2-Butanone)	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Methylene Chloride	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Naphthalene	**10**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	7.3	1.4 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	**290**	**130**
N-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
N-Propylbenzene	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
O-Xylene (1,2-Dimethylbenzene)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.6 J	1.1 J
Sec-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Styrene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
T-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Tert-Butyl Methyl Ether	10	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Tetrachloroethylene (PCE)	5	UG/L	0.9	0.98	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
Toluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Total, 1,3-Dichloropropene (Cis And Trans)	0.4	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
Trans-1,2-Dichloroethene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Trans-1,3-Dichloropropene	--	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
Trans-1,4-Dichloro-2-Butene	--	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Trichloroethylene (TCE)	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.24 J	0.35 J	0.5 U	0.5 U	1 U	0.5 U
Trichlorofluoromethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	2.5 U
Vinyl Acetate	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Vinyl Chloride	**2**	UG/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.7	1.6	1.4	**2.5**	**2.4**	2 U	0.17 J
Xylenes	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	3.6 J	2 J

Table 9. Summary of Volatile Organic Compounds in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

	Sample Designation:		TW-9	TW-10	TW-11	TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
	Sample Date:		01/13/2020	01/13/2020	01/13/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
	Normal or Field Duplicate:		N	N	N	N	N	FD	N	N	N	N
Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units										
1,1,1,2-Tetrachloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane (TCA)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	1	UG/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
1,1-Dichloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloropropene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	0.04	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4,5-Tetramethylbenzene	**5**	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	**9.6**	**14**	1.4 J	2 U
1,2,4-Trichlorobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	0.04	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	0.6	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene (Mesitylene)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dichlorobenzene	3	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Diethyl Benzene	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	1 J	2	2 U	2 U
1,4-Dioxane (P-Dioxane)	--	UG/L	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,2-Dichloropropane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorotoluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
4-Ethyltoluene	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Acetone	50	UG/L	5 U	5 U	5 U	5 U	3.2 J	5 U	21	5 U	5 U	5 U
Acrylonitrile	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	**1**	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	**8**	**8**	0.56	0.5 U	0.5 U	0.5 U
Bromobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Bromochloromethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	50	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	50	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromomethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Carbon Disulfide	60	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloroethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloroform	7	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloromethane	--	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Cis-1,2-Dichloroethylene	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.3 J	1.1 J	1.1 J	2.5 U	2.5 U	2.5 U	2.5 U
Cis-1,3-Dichloropropene	5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cymene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Dibromochloromethane	50	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromomethane	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Table 9. Summary of Volatile Organic Compounds in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

	Sample Designation:		TW-9	TW-10	TW-11	TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
	Sample Date:		01/13/2020	01/13/2020	01/13/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
	Normal or Field Duplicate:		N	N	N	N	N	FD	N	N	N	N
Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units										
Dichloroethylenes	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.3 J	1.1 J	1.1 J	2.5 U	2.5 U	2.5 U	2.5 U
Diethyl Ether (Ethyl Ether)	--	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Ethylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	3.6	3.8	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	0.5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.97 J	**5.2**	2.5 U	2.5 U
m,p-Xylene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	**10**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	5.9	8.6	0.81 J	2.1 J	2.5 U	2.5 U
N-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.7 J	2.5 U	2.5 U
N-Propylbenzene	**5**	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.2 J	**8**	2.5 U	2.5 U
O-Xylene (1,2-Dimethylbenzene)	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	0.84 J	0.99 J	2.5 U	2.5 U	2.5 U	2.5 U
Sec-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.9 J	2.5 U	2.5 U
Styrene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
T-Butylbenzene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Tert-Butyl Methyl Ether	10	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethylene (PCE)	5	UG/L	0.5 U	0.5 U	0.5 U	2.8	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	0.89 J	0.95 J	2.5 U	2.5 U	2.5 U	2.5 U
Total, 1,3-Dichloropropene (Cis And Trans)	0.4	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trans-1,2-Dichloroethene	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Trans-1,3-Dichloropropene	--	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trans-1,4-Dichloro-2-Butene	--	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethylene (TCE)	5	UG/L	0.5 U	0.5 U	0.5 U	0.82	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Chloride	**2**	UG/L	1 U	1 U	1 U	0.52 J	0.65 J	1.1	0.14 J	1 U	1 U	1 U
Xylenes	5	UG/L	2.5 U	2.5 U	2.5 U	2.5 U	0.84 J	0.99 J	2.5 U	2.5 U	2.5 U	2.5 U

Table 10. Summary of Semivolatile Organic Compounds in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units	TW-4	TW-5	TW-6	TW-7	TW-8	TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
Sample Date:			03/16/2020	03/16/2020	03/17/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
Normal or Field Duplicate:			N	N	N	N	N	N	N	FD	N	N	N	N
1,2,4,5-Tetrachlorobenzene	--	UG/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	3	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	3	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,4-Dichlorobenzene	3	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,4-Dioxane (P-Dioxane)	--	UG/L	NA	NA	NA	NA	NA	0.134 U	0.139 U	0.144 U	0.0946 J	0.231	0.219	0.354
2,4,5-Trichlorophenol	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 R	5 U
2,4,6-Trichlorophenol	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 R	5 U
2,4-Dichlorophenol	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 R	5 U
2,4-Dimethylphenol	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 R	5 U
2,4-Dinitrophenol	10	UG/L	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 R	20 U
2,4-Dinitrotoluene	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Chloronaphthalene	10	UG/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Chlorophenol	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 R	2 U
2-Methylnaphthalene	--	UG/L	0.58	0.32	0.1 U	0.02 J	3.1	0.03 J	0.32	0.54	0.14	20	0.19	0.06 J
2-Methylphenol (O-Cresol)	--	UG/L	5 U	5 U	5 U	5 U	0.7 J	5 U	5 U	0.63 J	5 U	5 U	5 R	5 U
2-Nitroaniline	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	--	UG/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 R	10 U
3- And 4- Methylphenol (Total)	--	UG/L	5 U	5 U	5 U	5 U	1.2 J	5 U	0.72 J	1.1 J	5 U	5 U	5 R	5 U
3,3'-Dichlorobenzidine	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 R
3-Nitroaniline	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4,6-Dinitro-2-Methylphenol	--	UG/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl Phenyl Ether	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chloro-3-Methylphenol	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chloroaniline	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl Phenyl Ether	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Nitroaniline	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Nitrophenol	--	UG/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 R	10 U
Acenaphthene	**20**	UG/L	4.2	3.8	4.4	**30**	**24**	2.3	**53**	**35**	**31**	6	0.88	0.26
Acenaphthylene	20	UG/L	0.14	0.23	0.04 J	0.05 J	0.2	0.02 J	0.61	0.38	0.19	0.81	0.14	0.03 J
Acetophenone	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Anthracene	50	UG/L	0.72	2.2	0.11	0.11	1.2	0.12	0.86	0.99	0.27	2.9	0.38	0.1
Benzo(A)Anthracene	**0.002**	UG/L	**0.92**	**6**	0.1 U	0.1 U	**0.19**	**0.08 J**	**0.88**	**2.2**	**0.06 J**	**3.8**	**1.4**	**0.08 J**
Benzo(A)Pyrene	**0**	UG/L	**0.88**	**11**	0.1 U	0.1 U	**0.07 J**	**0.02 J**	**0.5**	**1.2**	**0.02 J**	**4.6**	**1.6**	**0.07 J**
Benzo(B)Fluoranthene	**0.002**	UG/L	**0.99**	**8**	0.1 U	0.1 U	**0.12**	**0.03 J**	**0.7**	**1.8**	**0.03 J**	**5.1**	**1.6**	**0.08 J**
Benzo(G,H,I)Perylene	--	UG/L	0.83	48	0.1 U	0.1 U	0.05 J	0.1 U	0.32	0.8	0.03 J	4.6	1.7	0.05 J
Benzo(K)Fluoranthene	**0.002**	UG/L	**0.33**	**2**	0.1 U	0.1 U	**0.04 J**	**0.01 J**	**0.22**	**0.59**	**0.01 J**	**1.4**	**0.56**	**0.03 J**
Benzoic Acid	--	UG/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U	10 J	12 J	50 U	50 U	50 U
Benzyl Alcohol	--	UG/L	2 U	2 U	2 U	2 U	2 U	1.5 J	2.7	5.1	8.4	2 U	0.76 J	2 U
Benzyl Butyl Phthalate	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Biphenyl (Diphenyl)	--	UG/L	2 U	2 U	2 U	2 U	1.5 J	2 U	1.8 J	0.5 J	2 U	2 U	2 U	2 U
Bis(2-Chloroethoxy) Methane	5	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bis(2-Chloroisopropyl) Ether	5	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bis(2-Ethylhexyl) Phthalate	5	UG/L	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Carbazole	--	UG/L	2 U	2 U	2 U	2 U	5	2 U	4.4	1.2 J	2 U	2 U	2 U	2 U
Chrysene	**0.002**	UG/L	**0.86**	**6.8**	0.1 U	0.1 U	**0.16**	**0.04 J**	**0.72**	**1.9**	**0.04 J**	**3.6**	**1.5**	**0.06 J**
Dibenz(A,H)Anthracene	--	UG/L	0.23	9.2	0.1 U	0.1 U	0.01 J	0.1 U	0.07 J	0.18	0.1 U	0.86	0.38	0.01 J

Table 10. Summary of Semivolatile Organic Compounds in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units	TW-4	TW-5	TW-6	TW-7	TW-8	TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
Sample Date:			03/16/2020	03/16/2020	03/17/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
Normal or Field Duplicate:			N	N	N	N	N	N	N	FD	N	N	N	N
Dibenzofuran	--	UG/L	1.1 J	2 U	2 U	2 U	6.8	2 U	10	2.2	2 U	2 U	2 U	2 U
Diethyl Phthalate	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dimethyl Phthalate	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Di-N-Butyl Phthalate	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.6 J	5 U	5 U	5 U	5 U
Di-N-Octylphthalate	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Fluoranthene	50	UG/L	3	7.4	0.44	0.05 J	3	0.62	3.7	5.3	0.61	8	2	0.23
Fluorene	50	UG/L	2.4	2.1	0.17	0.22	9.9	0.31	8.3	3.5	8.2	4.9	0.35	0.16
Hexachlorobenzene	0.04	UG/L	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Hexachlorobutadiene	0.5	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorocyclopentadiene	5	UG/L	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Hexachloroethane	5	UG/L	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Indeno(1,2,3-C,D)Pyrene	**0.002**	UG/L	**0.64**	**15**	0.1 U	0.1 U	**0.05 J**	0.1 U	**0.3**	**0.79**	**0.03 J**	**3.7**	**1.2**	**0.05 J**
Isophorone	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Naphthalene	**10**	UG/L	1.3	0.48	0.1 U	0.07 J	**61**	0.12	5	4.1	0.23	0.54	0.2	0.12
Nitrobenzene	0.4	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
N-Nitrosodi-N-Propylamine	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
N-Nitrosodiphenylamine	50	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Pentachlorophenol	1	UG/L	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Phenanthrene	50	UG/L	4.4	5	0.08 J	0.13	11	0.14	3.1	1.7	2.1	12	1.4	0.59
Phenol	**1**	UG/L	5 U	5 U	5 U	5 U	**1.1 J**	5 U	0.86 J	**1.4 J**	**24**	5 U	5 R	5 U
Pyrene	50	UG/L	2.5	9	0.44	0.12	1.9	1.3	5.1	10	0.45	8.1	2.3	0.21

Table 11. Summary of Metals in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units	Sample Designation:	TW-4	TW-5	TW-5	TW-6	TW-6	TW-7	TW-7	TW-8	TW-8	TW-12	TW-12	TW-13	TW-13	TW-13	TW-13
			Sample Date:	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020
			Normal or Field Duplicate:	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	FD
				Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Aluminum	--	UG/L		3150	10 U	2930	3.31 J	9190	10 U	442	3.9 J	11300	10 U	168000	253	3780	10.4	4030	50.5
Antimony	**3**	UG/L		1.72 J	0.67 J	1.11 J	0.44 J	4 U	1.15 J	4 U	0.87 J	1.88 J	0.82 J	4 U	0.74 J	1.32 J	1.34 J	1.25 J	**4.2**
Arsenic	**25**	UG/L		23.72	2.28	6.89	0.79	4.16	1.27	3.58	2.24	7.14	0.8	**29.63**	1.09	4.81	1.05	4.58	6.11
Barium	**1000**	UG/L		623	373.7	256.5	127.9	208.9	83.87	124.9	80.26	453.5	244.3	**4223**	72.69	192.2	138.7	187	92.79
Beryllium	**3**	UG/L		0.28 J	0.5 U	0.33 J	0.5 U	0.46 J	0.5 U	0.5 U	0.5 U	0.94	0.5 U	**19.05**	0.5 U	0.14 J	0.5 U	0.19 J	0.5 U
Cadmium	5	UG/L		0.84	0.2 U	0.24	0.2 U	0.13 J	0.2 U	0.2 U	0.2 U	0.32	0.2 U	4.37	0.2 U	0.17 J	0.2 U	0.15 J	0.2 U
Calcium	--	UG/L		146000	144000	57400	53400	118000	85200	37600	37500	138000	124000	117000	18200	229000	143000	233000	98400
Chromium III	--	UG/L		10 U	NA	10 U	NA	21	NA	10 U	NA	26 J	NA	314	NA	14	NA	12	NA
Chromium, Hexavalent	50	UG/L		10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Chromium, Total	**50**	UG/L		7.87	1 U	5.06	1 U	21.6	1 U	1 U	1 U	26.01 J	1 U	**313.9**	1 U	14.08	1 U	12.26	1 U
Cobalt	--	UG/L		4.45	0.41 J	3.14	0.5 U	8.11	0.37 J	0.85	0.33 J	8.06 J	0.29 J	223.5	0.33 J	2.57	0.7	3.13	0.4 J
Copper	**200**	UG/L		46.65	0.71 J	18.35	1 U	34.52	1 U	1.96	1 U	46.28 J	1 U	**988.4**	0.85 J	21.16	1 U	22.52	0.86 J
Cyanide	**200**	UG/L		10	NA	3 J	NA	2 J	NA	2 J	NA	5 U	NA	5	NA	31	NA	66	NA
Iron	**300**	UG/L		**19000**	**2100**	**6380**	**307**	**14400**	50 U	**3900**	156	**40300**	**7680**	**214000**	228	**6910**	61	**7250**	69.1
Lead	**25**	UG/L		**286.6**	1 U	**124.2**	1 U	20.2	1 U	1.66	1 U	**122**	1 U	**1243**	0.45 J	**67.77**	1 U	**74.06**	1 U
Magnesium	**35000**	UG/L		19100	18300	7610	6410	14400	10200	3900	3900	**44900**	**40000**	**35700**	1340	24600	18100	24300	7610
Manganese	**300**	UG/L		**1215**	**998.1**	243.4	145.4	**3419**	**2367**	**992.2**	**913**	**1429**	**1043**	**12750**	114.9	**1522**	**1441**	**1567**	10.76
Mercury	**0.7**	UG/L		**1.31**	1 U	0.42	0.2 U	0.11 J	0.2 U	0.2 U	0.2 U	0.38	0.2 U	**1.5**	0.2 U	0.2 U	0.2 U	0.1 J	0.2 U
Nickel	**100**	UG/L		10.03	2 U	7.61	2 U	13.29	2 U	0.97 J	2 U	18.45 J	0.65 J	**292.8**	0.68 J	4.78	1.35 J	6.54	1.74 J
Potassium	--	UG/L		19500	20000	19800	19500	13500	11000	12600	12600	24500	24700	36000	8860	50000	32200	49500	27100
Selenium	**10**	UG/L		2.39 J	5 U	1.75 J	5 U	2.08 J	5 U	5 U	5 U	5.75 J	5 U	**65.4**	5 U	3.24 J	2.59 J	2.71 J	2.67 J
Silver	50	UG/L		0.75	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	2.65	0.4 U	0.56	0.4 U	0.5	0.4 U
Sodium	**20000**	UG/L		**248000**	**258000**	**23500**	**22200**	**170000**	**167000**	**209000**	**203000**	**300000**	**306000**	**246000**	**204000**	**146000**	**128000**	**148000**	**125000**
Thallium	**0.5**	UG/L		0.18 J	1 U	1 U	1 U	0.17 J	0.35 J	1 U	1 U	0.19 J	1 U	**1.6**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vanadium	--	UG/L		16.26	5 U	14.67	5 U	26.57	5 U	1.78 J	5 U	38.1	5 U	451.5	2.82 J	15.11	5 U	15.82	41.29
Zinc	2000	UG/L		388.3	10 U	246.1	10 U	43.11	10 U	10 U	10 U	172.8	10 U	1737	4.36 J	53.53	10 U	57.66	10 U

Table 11. Summary of Metals in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:			TW-14	TW-14	TW-15	TW-15	TW-16	TW-16	TW-17	TW-17
Sample Date:			03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020	03/18/2020	03/18/2020	03/18/2020
Normal or Field Duplicate:			N	N	N	N	N	N	N	N
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units								
Aluminum	--	UG/L	145000	8.95 J	213	7.82 U	9070	3.91 U	33.8	10 U
Antimony	**3**	UG/L	4 U	0.7 J	1.62 J	**5.34**	**3.09 J**	1.9 U	1.74 J	**7.99**
Arsenic	**25**	UG/L	**26.25**	1.52	**38.91**	**28.99**	**228.5**	20.08	19.61	12.13
Barium	**1000**	UG/L	**2742**	165.9	427.6	354.3	380	186.5	542	377.9
Beryllium	**3**	UG/L	**13.55**	0.5 U	0.5 U	0.5 U	0.6	0.5 U	0.5 U	0.5 U
Cadmium	5	UG/L	2.79	0.2 U	0.16 J	0.2 U	4.35	0.2 U	0.1 J	0.2 U
Calcium	--	UG/L	168000	57600	116000	110000	135000	120000	111000	113000
Chromium III	--	UG/L	413	NA	10 U	NA	18	NA	10 U	NA
Chromium, Hexavalent	50	UG/L	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Chromium, Total	**50**	UG/L	**412.8**	1 U	2.15 B	0.92 U	18.67	0.82 U	1.17 B	0.96 U
Cobalt	--	UG/L	174	0.27 J	0.81	0.67	14.89	2.91	0.55	0.44 J
Copper	**200**	UG/L	**666.1**	1 U	4.72 B	1 U	**269.2**	1 U	2.85 B	0.67 U
Cyanide	**200**	UG/L	2 J	NA	**2310**	NA	6	NA	66	NA
Iron	**300**	UG/L	**246000**	50 U	**6390**	143	**28400**	**982**	**13000**	99.3 J
Lead	**25**	UG/L	**754.5**	1 U	**54.97**	0.79 J	**466.9**	1 U	**33.39**	0.59 J
Magnesium	**35000**	UG/L	**47000**	3880	12700	11700	25100	18900	20100	18300
Manganese	**300**	UG/L	**6615**	143.2	**414.5**	293.5	**4490**	**3642**	**333.8**	245.5
Mercury	**0.7**	UG/L	**0.84**	0.2 U	0.2 U	0.2 U	**0.92**	0.2 U	0.2 U	0.2 U
Nickel	**100**	UG/L	**244.9**	0.92 J	1.7 J	1.32 J	32.51	6.35	1.62 J	1.35 J
Potassium	--	UG/L	37900	12300	31400	31700	17800	16400	22100	23200
Selenium	**10**	UG/L	**43.1**	5 U	5 U	5 U	**24.2**	5 U	5 U	5 U
Silver	50	UG/L	1.29	0.4 U	0.4 U	0.4 U	0.36 J	0.4 U	0.4 U	0.4 U
Sodium	**20000**	UG/L	**260000**	**232000**	**292000**	**270000**	**284000**	**262000**	**147000**	**150000**
Thallium	**0.5**	UG/L	**1.76**	0.5 U	0.14 J	0.36 J	**0.66 J**	0.14 J	0.2 J	0.32 J
Vanadium	--	UG/L	507.4	2.1 J	1.98 J	5 U	31.75	5 U	5 U	5 U
Zinc	2000	UG/L	994.6	10 U	111.2	4.47 J	1842	28.34	148.7	10.32

Table 12. Summary of Polychlorinated Biphenyls in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

	Sample Designation:		TW-4	TW-5	TW-6	TW-7	TW-8	TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
	Sample Date:		03/16/2020	03/16/2020	03/17/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
	Normal or Field Duplicate:		N	N	N	N	N	N	N	FD	N	N	N	N
Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units												
PCB-1016 (Aroclor 1016)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1221 (Aroclor 1221)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1232 (Aroclor 1232)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1242 (Aroclor 1242)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1248 (Aroclor 1248)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1254 (Aroclor 1254)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1260 (Aroclor 1260)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1262 (Aroclor 1262)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
PCB-1268 (Aroclor 1268)	--	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
Polychlorinated Biphenyl (PCBs)	0.09	UG/L	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U

Table 13. Summary of Pesticides and Herbicides in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Parameters	NYSDEC Ambient Water-Quality and Guidance Values	Units	TW-4	TW-5	TW-6	TW-7	TW-8	TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
Sample Designation:			TW-4	TW-5	TW-6	TW-7	TW-8	TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
Sample Date:			03/16/2020	03/16/2020	03/17/2020	03/16/2020	03/16/2020	03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
Normal or Field Duplicate:			N	N	N	N	N	N	N	FD	N	N	N	N
2,4-D (Dichlorophenoxyacetic Acid)	50	UG/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Aldrin	0	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	--	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Alpha Endosulfan	--	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Beta Bhc (Beta Hexachlorocyclohexane)	--	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Beta Endosulfan	--	UG/L	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
Chlordane	0.05	UG/L	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U
cis-Chlordane	--	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.005 J	0.008 J	0.014 U	0.014 U	0.014 U	0.014 U
Delta BHC (Delta Hexachlorocyclohexane)	--	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Dieldrin	0.004	UG/L	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
Endosulfan Sulfate	--	UG/L	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
Endrin	0	UG/L	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
Endrin Aldehyde	5	UG/L	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
Endrin Ketone	--	UG/L	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U
Gamma Bhc (Lindane)	--	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Heptachlor	0.04	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Heptachlor Epoxide	0.03	UG/L	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Methoxychlor	35	UG/L	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U
P,P'-DDD	0.3	UG/L	0.029 U	0.006 J	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.006 J	0.029 U	0.029 U	0.029 U	0.029 U
P,P'-DDE	0.2	UG/L	0.005 J	0.029 U	0.029 U	0.029 U	0.029 U	0.003 J	0.019 J	0.031	0.029 U	0.029 U	0.029 U	0.029 U
P,P'-DDT	0.2	UG/L	0.004 J	0.007 J	0.029 U	0.029 U	0.003 J	0.029 U	0.029 U	0.029 U	0.005 J	0.029 U	0.029 U	0.029 U
Silvex (2,4,5-TP)	0.26	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Toxaphene	0.06	UG/L	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U	0.143 U
trans-Chlordane	**0**	UG/L	**0.013 J**	**0.008 J**	0.014 U	0.014 U	**0.006 J**	0.014 U	**0.014 J**	**0.029 J**	0.014 U	0.014 U	0.014 U	0.014 U

Table 14. Summary of Per- and Polyfluoroalkyl Substances in Groundwater, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		TW-12	TW-13	TW-13	TW-14	TW-15	TW-16	TW-17
Sample Date:		03/17/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
Sample Depth (ft bls):		0 - 5	0 - 5	0 - 5	1 - 6	1 - 6	1 - 6	1 - 6
Normal or Field Duplicate:		N	N	FD	N	N	N	N
Parameters	Units							
2-(N-methyl perfluorooctanesulfonamido) acetic acid	NG/L	0.625 U	0.681 U	0.616 U	0.653 U	0.621 U	0.616 U	0.625 U
N-Ethyl-N-((heptadecafluorooctyl)sulphonyl) glycine	NG/L	0.776 U	0.844 U	0.764 U	**1.54 J**	0.77 U	0.764 U	0.776 U
Perfluorobutanesulfonic acid (PFBS)	NG/L	**5.17**	**45.3**	**46.2**	**4.31**	**12.8**	**26.1**	**17.6**
Perfluorobutanoic Acid	NG/L	**5.6**	**18**	**16.7**	**9.62**	**15.7**	**15.2**	**18.9**
Perfluorodecane Sulfonic Acid	NG/L	0.946 U	**1.7 J**	0.932 U	0.988 U	0.939 U	0.932 U	0.946 U
Perfluorodecanoic acid (PFDA)	NG/L	**0.83 J**	**0.983 J**	0.289 U	**0.544 J**	**0.92 J**	0.289 U	**0.583 J**
Perfluorododecanoic acid (PFDoA)	NG/L	0.359 U	0.391 U	0.354 U	0.375 U	0.356 U	0.354 U	0.359 U
Perfluoroheptane Sulfonate (PFHPS)	NG/L	**1.47 J**	0.723 U	0.654 U	**1.66 J**	**1.58 J**	0.654 U	**0.683 J**
Perfluoroheptanoic acid (PFHpA)	NG/L	**6.88**	**8.12**	**7.86**	**8.03**	**10.8**	**10.1**	**15.6**
Perfluorohexanesulfonic acid (PFHxS)	NG/L	**1.92 J**	**5.12 J**	**3.62 J**	**3.48**	**5.2**	**7.08**	**14.8**
Perfluorohexanoic acid (PFHxA)	NG/L	**10.2**	**12.7 J**	**11.8 J**	**14.4**	**20.4**	**22.2**	**23.9**
Perfluorononanoic acid (PFNA)	NG/L	**6.05**	**1.86 J**	**0.81 J**	**8.1**	**2.72**	**2.87**	**4.23**
Perfluorooctane Sulfonamide (FOSA)	NG/L	0.56 U	0.609 U	0.551 U	0.585 U	0.556 U	0.551 U	0.56 U
Perfluorooctanesulfonic acid (PFOS)	NG/L	**351**	**11.8 J**	**6.2 J**	**119**	**36.1 J**	**21.1**	**48.8 J**
Perfluorooctanoic acid (PFOA)	NG/L	**37.6**	**49.4**	**43.7**	**31.3**	**47.7**	**64.3**	**47.8**
Perfluoropentanoic Acid (PFPeA)	NG/L	**9.25**	**13.8**	**11.8**	**17.6**	**23.4**	**25.6**	**28.9**
Perfluorotetradecanoic acid (PFTA)	NG/L	0.239 U	0.26 U	0.236 U	0.25 U	0.238 U	0.236 U	0.239 U
Perfluorotridecanoic Acid (PFTriA)	NG/L	0.316 U	0.344 U	0.311 U	0.33 U	0.313 U	0.311 U	0.316 U
Perfluoroundecanoic Acid (PFUnA)	NG/L	0.251 U	0.273 U	0.247 U	0.262 U	0.249 U	0.247 U	0.251 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	NG/L	1.17 U	1.27 U	1.15 U	1.22 U	1.16 U	1.15 U	1.17 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	NG/L	1.28 U	1.4 U	**1.31 J**	1.34 U	**1.41 J**	**1.61 J**	1.28 U
TOTAL PFOA AND PFOS	NG/L	**389**	**61.2**	**49.9**	**150**	**83.8**	**85.4**	**96.6**

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		AA-1	AA-1	AA-1	AA-1	AA-1	AA-2	AA-2	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-2	IA-2	IA-2
Sample Date:		08/23/2019	09/26/2019	12/06/2020	03/04/2021	04/12/2021	12/03/2019	03/17/2020	08/23/2019	09/26/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021	08/23/2019	09/26/2019	09/08/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit																				
Carbon Tetrachloride	UG/M3	**0.419**	**0.478**	**0.371**	**0.44**	**0.396**	**0.503**	**0.409**	**0.396**	**0.484**	**0.503**	**0.384**	**0.497**	**0.421**	**0.39**	**0.465**	**0.428**	**0.428**	**0.403**	**0.497**	**0.453**
1,1,1-Trichloroethane (TCA)	UG/M3	0.192 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U
Cis-1,2-Dichloroethylene	UG/M3	0.139 U	**0.202**	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	**1.19**	**0.801**	**4.12**	**1.17**	**0.464**	**1.51**	0.079 U	0.079 U	0.079 U	0.079 U	**1.65**	**1.69**
1,1-Dichloroethene	UG/M3	0.139 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U
Trichloroethylene (TCE)	UG/M3	0.189 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	**0.199**	0.107 U	**0.129**	0.107 U	0.107 U	**0.758**	**0.231**	0.107 U	**0.242**	**0.107**	**0.704**	0.107 U
Tetrachloroethylene (PCE)	UG/M3	**1.12**	**0.956**	0.136 U	0.136 U	**0.407**	**0.285**	**0.502**	**1.01**	**2.27**	**0.495**	**2.31**	**0.644**	**0.332**	**1.29**	0.136 U	0.136 U	**0.461**	**0.956**	**5.93**	**0.719**
Methylene Chloride	UG/M3	3.05 U	**2.23**	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	**3.41**	1.74 U	1.74 U	1.74 U	1.74 U	**28.9**	**74**	**16.7**	**4.48**	**8.41**	1.74 U	1.74 U	1.74 U
Vinyl Chloride	UG/M3	0.09 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	**0.169**	0.051 U	**0.181**	**0.064**	0.051 U	**0.059**	0.051 U	0.051 U	0.051 U	0.051 U	**0.194**	**0.092**
1,1,2,2-Tetrachloroethane	UG/M3	0.241 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	0.672 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	0.192 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.142 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	0.651 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	**1.21**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	**1.05**	**1.1**	0.983 U	0.983 U	0.983 U	0.983 U	**1.37**	0.983 U	0.983 U	0.983 U	**1.06**	0.983 U	0.983 U
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	0.27 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	0.211 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.142 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.162 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	0.613 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	**0.353**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.078 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	0.211 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	**0.263**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.631 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	**9.9**	**1.85**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**1.54**	**9.29**	0.934 U	0.934 U	**1.17**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**5.42**	**1.07**
2-Hexanone	UG/M3	1.44 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
4-Ethyltoluene	UG/M3	**0.327**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
Acetone	UG/M3	**15.6**	**10.4**	2.38 U	**4.73**	**6.25**	**4.87**	**8.39**	**26.4**	**29.9**	**4.87**	**10.2**	**20.8**	**14.6**	**43**	**13.7**	**16**	**17.9**	**27.8**	**29.5**	**15.4**
Allyl Chloride (3-Chloropropene)	UG/M3	1.1 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	UG/M3	**0.693**	0.639 U	0.639 U	0.639 U	0.639 U	**0.882**	**0.703**	**1.02**	**0.754**	0.639 U	0.639 U	0.639 U	**0.703**	0.639 U	0.639 U	0.639 U	0.639 U	**0.652**	**0.732**	0.639 U
Benzyl Chloride	UG/M3	1.82 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	0.235 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoform	UG/M3	0.363 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.136 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	1.09 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	**1.17**	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	**0.956**	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U
Chlorobenzene	UG/M3	0.806 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.462 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	UG/M3	**0.274**	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	**1.02**	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U
Chloromethane	UG/M3	**1.11**	**1.03**	**0.956**	**1.08**	**1.21**	**0.993**	**1.29**	**0.983**	**1.03**	**1.1**	**1.42**	**1.07**	**0.954**	**1.02**	**0.915**	**1.03**	**1.27**	**0.954**	**1.03**	**1.04**
Cis-1,3-Dichloropropene	UG/M3	0.159 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	UG/M3	1.21 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	**0.916**	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	**1.37**	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U
Dibromochloromethane	UG/M3	0.299 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**1.96**	**2.52**	**1.87**	**1.34**	**2.2**	**2.32**	**2.28**	**2.1**	**2.54**	**2.43**	**2.35**	**2.04**	**2.19**	**1.82**	**2.26**	**1.3**	**2.3**	**2.18**	**2.49**	**1.97**
Ethanol	UG/M3	**36.4**	**47.5**	9.42 U	**12.4**	9.42 U	**11.1**	**20.7**	**318**	**281**	**21.1**	**43.5**	**226**	**22.6**	**29.2**	**38.3**	**71.8**	**79.9**	**616**	**207**	**149**
Ethyl Acetate	UG/M3	3.16 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	**2.25**	1.8 U	1.8 U	1.8 U	**2.01**	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	**4.07**	1.8 U	**1.81**
Ethylbenzene	UG/M3	**1.01**	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	**1.28**	**2.17**	**4.06**	**1.24**	**1.46**	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	**1.52**	**1.21**	**1.12**
Hexachlorobutadiene	UG/M3	0.935 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Isopropanol	UG/M3	**2.46**	**1.99**	1.23 U	**2.16**	**2.78**	**1.34**	**5.83**	**3.71**	**8.16**	**7.35**	**5.73**	**295**	**15.7**	**15.6**	**5.8**	**14.3**	**20.4**	**3.69**	**6.76**	**155**
m,p-Xylene	UG/M3	**3.47**	**1.82**	1.74 U	1.74 U	1.74 U	**1.95**	1.74 U	**4.6**	**10.8**	**17.8**	**5.17**	**7.08**	1.74 U	**2.67**	1.74 U	1.74 U	1.74 U	**5.73**	**5.56**	**5.13**
Methyl Ethyl Ketone (2-Butanone)	UG/M3	2.59 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**1.52**	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	3.59 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	**7.95**	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	**2.17**	**16.3**	2.05 U	2.05 U
N-Heptane	UG/M3	1.44 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	**1.02**	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
N-Hexane	UG/M3	1.24 U	**0.916**	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	**2.22**	**1.13**	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	**0.754**	**1.3**	0.705 U
O-Xylene (1,2-Dimethylbenzene)	UG/M3	**1.03**	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	**1.32**	**3.21**	**5.17**	**1.63**	**2.22**	0.869 U	**0.973**	0.869 U	0.869 U	0.869 U	**1.58**	**1.69**	**1.7**

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		AA-1	AA-1	AA-1	AA-1	AA-1	AA-2	AA-2	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-1	IA-2	IA-2	IA-2
Sample Date:		08/23/2019	09/26/2019	12/06/2020	03/04/2021	04/12/2021	12/03/2019	03/17/2020	08/23/2019	09/26/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021	08/23/2019	09/26/2019	09/08/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit																				
Styrene	UG/M3	**0.239**	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	**0.984**	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	**1.49**	0.852 U	**0.92**	0.852 U
Tert-Butyl Alcohol	UG/M3	2.66 U	**3.55**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	**1.79**	**23.3**	1.52 U	1.52 U	**6.09**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	**2.99**	**19.6**	**2.82**
Tert-Butyl Methyl Ether	UG/M3	1.27 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	**2.68**	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**6.19**	**1.58**	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**3.24**	1.47 U	1.47 U
Toluene	UG/M3	**4.45**	**1.84**	0.754 U	0.754 U	**2.46**	**1.76**	**2.75**	**5.8**	**2.33**	0.754 U	**2.08**	**45.2**	**2.94**	**9.08**	**3.47**	**1.18**	**6.78**	**4.6**	**2.06**	**24.8**
Trans-1,2-Dichloroethene	UG/M3	0.139 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.159 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	**1.01**	**1.31**	1.12 U	1.12 U	**1.3**	1.12 U	**1.4**	1.12 U	**1.28**	**1.19**	**1.43**	1.12 U	**1.25**	1.12 U	**1.19**	1.12 U	**1.38**	1.12 U	**1.25**	1.12 U
Vinyl Bromide	UG/M3	1.53 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-2	IA-2	IA-2	IA-2	IA-2	IA-3	IA-3	IA-3	IA-3	IA-3	IA-3	IA-3	IA-4	IA-4	IA-4	IA-4	IA-4	IA-4	IA-4	IA-5
Sample Date:		11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	12/03/2019	03/18/2020	09/08/2020	11/19/2020	03/04/2021	03/04/2021	04/12/2021	12/03/2019
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Parameter	Unit																				
Carbon Tetrachloride	UG/M3	**0.428**	**0.396**	**0.44**	**0.491**	**0.428**	**0.465**	**0.44**	**0.39**	**0.535**	**0.465**	**0.459**	**0.403**	**0.428**	**0.396**	**0.421**	**0.434**	**0.522**	**0.459**	**0.403**	**0.497**
1,1,1-Trichloroethane (TCA)	UG/M3	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U
Cis-1,2-Dichloroethylene	UG/M3	**0.523**	**1.82**	0.079 U	0.079 U	0.079 U	**1.1**	**1.52**	**0.975**	**1.67**	**0.424**	0.079 U	0.079 U	**1.07**	**1.26**	**1.65**	**0.349**	0.079 U	0.079 U	0.079 U	**0.773**
1,1-Dichloroethene	UG/M3	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U
Trichloroethylene (TCE)	UG/M3	**0.269**	**0.957**	0.107 U	0.107 U	**0.118**	**0.328**	**0.134**	0.107 U	0.107 U	**0.236**	0.107 U	0.107 U	**0.134**	0.107 U	0.107 U	**0.15**	0.107 U	0.107 U	0.107 U	**0.124**
Tetrachloroethylene (PCE)	UG/M3	**0.332**	**2.01**	0.136 U	0.136 U	**0.468**	**5.21**	**1.5**	**1.32**	**0.732**	**0.278**	0.136 U	**0.427**	**2.24**	**0.848**	**0.705**	**0.264**	0.136 U	0.136 U	**0.4**	**1.8**
Methylene Chloride	UG/M3	**112**	**130**	**5.77**	1.74 U	**3.86**	1.74 U	1.74 U	1.74 U	1.74 U	**91.4**	1.74 U	**3.75**	1.74 U	1.74 U	1.74 U	**61.8**	**2.71**	**2.98**	**4.72**	1.74 U
Vinyl Chloride	UG/M3	0.051 U	**0.059**	0.051 U	0.051 U	0.051 U	**0.069**	**0.097**	**0.051**	**0.095**	0.051 U	0.051 U	0.051 U	**0.1**	**0.064**	**0.087**	0.051 U	0.051 U	0.051 U	0.051 U	**0.061**
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	0.983 U	**1.51**	0.983 U	0.983 U	0.983 U	**1.81**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	**1.46**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	**1.26**	**1.07**
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**1.04**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**1.18**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U
2-Hexanone	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
4-Ethyltoluene	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
Acetone	UG/M3	**13.2**	**28.7**	**7.72**	**6.1**	**11**	**7.44**	**5.11**	**8.34**	**14.8**	**11.2**	**5.72**	**10.7**	**6.27**	**12.3**	**15.6**	**10.7**	**7.96**	**11.8**	**10.8**	**6.7**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	UG/M3	**0.668**	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	**0.7**	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	**0.642**	0.639 U	0.639 U	0.639 U	0.639 U
Benzyl Chloride	UG/M3	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoform	UG/M3	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U
Chlorobenzene	UG/M3	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U
Chloromethane	UG/M3	**0.991**	**0.952**	**0.902**	**1.23**	**1.24**	**0.911**	**1.68**	**1.36**	**1.07**	**0.971**	**0.981**	**1.2**	**0.88**	**1.24**	**1.03**	**1.01**	**1.29**	**1.03**	**1.21**	**0.907**
Cis-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	UG/M3	0.688 U	0.688 U	**0.771**	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U
Dibromochloromethane	UG/M3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**2.1**	**1.81**	**2.29**	**1.53**	**2.27**	**2.37**	**2.45**	**2.38**	**2.03**	**2.33**	**1.4**	**2.17**	**2.3**	**2.3**	**1.95**	**2.28**	**1.64**	**2.13**	**2.24**	**2.44**
Ethanol	UG/M3	**23.7**	**42.4**	**18.8**	**27.1**	**31.3**	**15**	**40.9**	**33.4**	**147**	**23.2**	**23.4**	**26.6**	**18.2**	**62.4**	**144**	**20.3**	**41.1**	**35.6**	**23.4**	**13**
Ethyl Acetate	UG/M3	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Ethylbenzene	UG/M3	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	**2.49**	**5.13**	**1.37**	**1.04**	0.869 U	0.869 U	0.869 U	**2.98**	**1.95**	**1.16**	0.869 U	0.869 U	0.869 U	0.869 U	**2.53**
Hexachlorobutadiene	UG/M3	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Isopropanol	UG/M3	**16.6**	**15.5**	**4.69**	**2.56**	**26.5**	**4.18**	**24.2**	**6.19**	**152**	**14**	**2.06**	**23.5**	**3.79**	**7.23**	**170**	**10.9**	**11.4**	**12.4**	**9.76**	**3**
m,p-Xylene	UG/M3	1.74 U	**1.89**	1.74 U	1.74 U	1.74 U	**11.2**	**23.1**	**5.82**	**4.91**	1.74 U	1.74 U	1.74 U	**12.9**	**8.34**	**5.26**	1.74 U	1.74 U	1.74 U	1.74 U	**11.2**
Methyl Ethyl Ketone (2-Butanone)	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U
N-Heptane	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
N-Hexane	UG/M3	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	**0.768**	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U
O-Xylene (1,2-Dimethylbenzene)	UG/M3	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	**3.59**	**7.04**	**1.87**	**1.63**	0.869 U	0.869 U	0.869 U	**4.03**	**2.62**	**1.73**	0.869 U	0.869 U	0.869 U	0.869 U	**3.49**

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-2	IA-2	IA-2	IA-2	IA-2	IA-3	IA-3	IA-3	IA-3	IA-3	IA-3	IA-3	IA-4	IA-4	IA-4	IA-4	IA-4	IA-4	IA-4	IA-5
Sample Date:		11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	12/03/2019	03/18/2020	09/08/2020	11/19/2020	03/04/2021	03/04/2021	04/12/2021	12/03/2019
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Parameter	Unit																				
Styrene	UG/M3	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U
Tert-Butyl Alcohol	UG/M3	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	**1.55**	1.52 U	1.52 U	**2.82**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	**2.96**	1.52 U	1.52 U	1.52 U	1.52 U	**1.52**
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Toluene	UG/M3	**3.59**	**6.9**	**1.47**	**0.855**	**4.07**	**0.855**	0.754 U	**1.85**	**24.1**	**3.35**	**0.776**	**3.84**	**0.942**	**1.95**	**26.1**	**2.6**	**1.04**	**1.04**	**4.45**	**0.931**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	**1.27**	1.12 U	**1.23**	**1.15**	**1.35**	**1.37**	**1.17**	**1.45**	1.12 U	**1.32**	1.12 U	**1.29**	**1.37**	**1.35**	1.12 U	**1.34**	**1.2**	1.12 U	**1.36**	**1.43**
Vinyl Bromide	UG/M3	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-5	IA-5	IA-5	IA-5	IA-5	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-7	IA-7	IA-7	IA-7	IA-7	IA-7
Sample Date:		03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021	12/03/2019	03/17/2020	03/17/2020	09/08/2020	09/08/2020	11/19/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N
Parameter	Unit																				
Carbon Tetrachloride	UG/M3	**0.415**	**0.478**	**0.472**	**0.516**	**0.428**	**0.453**	**0.365**	**0.428**	**0.447**	**0.478**	**0.384**	**0.403**	**0.554**	**0.396**	**0.459**	**0.428**	**0.377**	**0.459 J**	**0.352**	**0.459**
1,1,1-Trichloroethane (TCA)	UG/M3	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	**0.147 J**	0.109 U	0.109 U
Cis-1,2-Dichloroethylene	UG/M3	**0.266**	**1.74**	**0.428**	0.079 U	0.079 U	**1.52**	**1**	**1.72**	**2.34**	**1.95**	**1.94**	**2**	**0.091**	**1.65**	**0.944**	**1.19**	**0.789**	**1.13 J**	**1.81**	**0.71**
1,1-Dichloroethene	UG/M3	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 UJ	0.079 U	0.079 U
Trichloroethylene (TCE)	UG/M3	0.107 U	0.107 U	0.107 U	0.107 U	**0.161**	**0.172**	**0.355**	0.107 U	0.107 U	0.107 U	**0.623**	0.107 U	0.107 U	**0.129**	0.107 U	0.107 U	0.107 U	0.107 UJ	0.107 U	0.107 U
Tetrachloroethylene (PCE)	UG/M3	**0.4**	**0.746**	**0.312**	0.136 U	**0.529**	**2.23**	**0.705**	**1.31**	**0.854**	**0.637**	**1.34**	**0.373**	0.136 U	**0.563**	**1.7**	**1.12**	**0.698**	**0.515 J**	**0.705**	**0.319**
Methylene Chloride	UG/M3	1.74 U	1.74 U	**25.8**	**6.01**	**11.1**	1.74 U	1.74 U	1.74 U	1.74 U	**28.3**	**68.1**	**6.74**	**3.51**	**4.06**	1.74 U	1.74 U	1.74 U	**2.49 J**	1.74 U	**27.7**
Vinyl Chloride	UG/M3	0.051 U	**0.087**	0.051 U	0.051 U	0.051 U	**0.141**	**0.059**	**0.072**	**0.112**	**0.082**	**0.061**	**0.102**	0.051 U	**0.148**	**0.082**	**0.064**	0.051 U	0.051 UJ	**0.087**	0.051 U
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 UJ	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 UJ	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 UJ	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 UJ	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 UJ	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	**2.49**	**1.56**	0.983 U	0.983 U	0.983 U	0.983 U	**1.13**	0.983 U	0.983 U	0.983 U	**1.88**	0.983 U	0.983 U	**2.91 J**	0.983 U	0.983 U
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 UJ	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 UJ	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 UJ	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 UJ	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 UJ	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 UJ	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	**1.05**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**1.09**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**10.2 J**	**1.28**	0.934 U
2-Hexanone	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 UJ	0.82 U	0.82 U
4-Ethyltoluene	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 UJ	0.983 U	0.983 U
Acetone	UG/M3	**11.7**	**15.3**	**9.95**	**14.3**	**20**	**6.89**	**4.13**	**9.36**	**15.9**	**13.8**	**31.6**	**33.5**	**17.5**	**15.6**	**6.98**	**8.67**	**11.8**	**14.5 J**	**22.3**	**11.8**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 UJ	0.626 U	0.626 U
Benzene	UG/M3	**0.639**	0.639 U	**0.68**	0.639 U	0.639 U	0.639 U	0.639 U	**0.706**	0.639 U	**0.693**	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	**5.91 J**	0.639 U	**0.661**
Benzyl Chloride	UG/M3	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 UJ	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 UJ	1.34 U	1.34 U
Bromoform	UG/M3	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 UJ	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 UJ	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 UJ	0.623 U	0.623 U
Chlorobenzene	UG/M3	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 UJ	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 UJ	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 UJ	0.977 U	0.977 U
Chloromethane	UG/M3	**1.27**	**1.04**	**1.03**	**1.17**	**1.26**	**0.938**	**1.09**	**1.32**	**1.06**	**1.03**	**1.02**	**0.907**	**1.16**	**1.26**	**0.904**	**1.31**	**1.6**	**1.09 J**	**1.04**	**1.02**
Cis-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 UJ	0.908 U	0.908 U
Cyclohexane	UG/M3	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	**12.2**	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	**5.4 J**	0.688 U	0.688 U
Dibromochloromethane	UG/M3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UJ	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**2.27**	**2.01**	**2.34**	**1.06**	**2.24**	**2.4**	**1.91**	**2.35**	**2**	**2.32**	**1.89**	**2.26**	**1.77**	**2.12**	**2.39**	**2.27**	**2.4**	**2.01 J**	**2.32**	**2.39**
Ethanol	UG/M3	**95.3**	**139**	**21.3**	**373**	**167**	**11.2**	**18.8**	**45.2**	**166**	**47.5**	**23.6**	**51.1**	**104**	**39.6**	**11.2**	**45.4**	**39.9**	**209 J**	**200**	**41.3**
Ethyl Acetate	UG/M3	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ	**2.01**	1.8 U
Ethylbenzene	UG/M3	**1.73**	**1.06**	0.869 U	0.869 U	0.869 U	**3.14**	**3.51**	**1.16**	**1.18**	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	**2.74**	**1.43**	**0.877**	**3.22 J**	**1.46**	0.869 U
Hexachlorobutadiene	UG/M3	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 UJ	2.13 U	2.13 U
Isopropanol	UG/M3	**9**	**144**	**14**	**89.5**	**13.3**	**2.8**	**5.46**	**5.68**	**183**	**53.8**	**13.2**	**22.7**	**43.5**	**24.2**	**2.51**	**6.15**	**5.97**	**99.8 J**	**273**	**38.8**
m,p-Xylene	UG/M3	**7.25**	**5**	1.74 U	1.74 U	1.74 U	**13.4**	**14.9**	**4.65**	**5.65**	1.74 U	**2.09**	1.74 U	1.74 U	1.74 U	**11.5**	**5.91**	**3.63**	**12.3 J**	**6.21**	1.74 U
Methyl Ethyl Ketone (2-Butanone)	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**3.13 J**	**1.51**	1.47 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	2.05 U	2.05 U	2.05 U	2.05 U	**4.79**	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 UJ	2.05 U	2.05 U
N-Heptane	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	**6.76 J**	0.82 U	0.82 U
N-Hexane	UG/M3	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	**25.1 J**	**0.74**	**1.49**
O-Xylene (1,2-Dimethylbenzene)	UG/M3	**2.38**	**1.64**	0.869 U	0.869 U	**1.03**	**4.16**	**4.3**	**1.49**	**1.85**	0.869 U	0.869 U	0.869 U	0.869 U	0.869 U	**3.58**	**1.88**	**1.18**	**4.11 J**	**2.01**	0.869 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-5	IA-5	IA-5	IA-5	IA-5	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-6	IA-7	IA-7	IA-7	IA-7	IA-7	IA-7
Sample Date:		03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021	12/03/2019	03/17/2020	03/17/2020	09/08/2020	09/08/2020	11/19/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N
Parameter	Unit																				
Styrene	UG/M3	0.852 U	0.852 U	0.852 U	0.852 U	**40.6**	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	**1.63**	0.852 U	0.852 U	0.852 U	0.852 UJ	0.852 U	0.852 U
Tert-Butyl Alcohol	UG/M3	1.52 U	**2.62**	1.52 U	1.52 U	**1.76**	**1.81**	1.52 U	1.52 U	**3.21**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 UJ	1.52 U	1.52 U
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 UJ	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**3.21**	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**1.48**	1.47 U	**2.16**	1.47 U	**5.57 J**	1.47 U	1.47 U
Toluene	UG/M3	**4.33**	**24.4**	**2.26**	**1.88**	**10.1**	**1.15**	**0.837**	**2.45**	**28.2**	**4.79**	**6.93**	**2.75**	**1.67**	**5.13**	**1.13**	**2.35**	**1.85**	**37 J**	**33.2**	**2.56**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 UJ	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 UJ	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	**1.39**	1.12 U	**1.33**	**1.17**	**1.36**	**1.38**	1.12 U	**1.38**	1.12 U	**1.29**	1.12 U	**1.17**	**1.22**	**1.28**	**1.39**	**1.26**	**1.49**	1.12 UJ	**1.32**	**1.26**
Vinyl Bromide	UG/M3	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 UJ	0.874 U	0.874 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-7	IA-7	IA-8	IA-8	IA-8	IA-8	IA-8	IA-8	IA-9	IA-9	IA-9	IA-9	IA-9	IA-9	IA-10	IA-10	IA-10	IA-10	IA-10	IA-10
Sample Date:		03/04/2021	04/12/2021	12/03/2019	03/17/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	03/17/2020	09/08/2020	11/19/2020	02/04/2021	03/04/2021	04/12/2021	03/17/2020	09/08/2020	11/19/2020	11/19/2020	03/04/2021	04/12/2021
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Parameter	Unit																				
Carbon Tetrachloride	UG/M3	**0.56**	**0.409**	**0.459**	**0.384**	**0.472**	**0.484**	**0.528**	**0.434**	**0.409**	**0.535**	**0.472**	**0.415**	**0.547**	**0.415**	**0.39**	**0.472**	**0.465**	**0.497**	**0.51**	**0.384**
1,1,1-Trichloroethane (TCA)	UG/M3	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U
Cis-1,2-Dichloroethylene	UG/M3	0.079 U	0.079 U	**0.646**	**0.48**	**1.41**	**0.416**	0.079 U	0.079 U	**1.82**	**2.21**	**0.829**	**1.67**	0.079 U	**0.856**	**1.26**	**1.57**	**1.79**	**1.8**	0.079 U	0.079 U
1,1-Dichloroethene	UG/M3	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U
Trichloroethylene (TCE)	UG/M3	0.107 U	**0.21**	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	**0.124**	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	**0.172**
Tetrachloroethylene (PCE)	UG/M3	0.136 U	**0.441**	**1.35**	**0.726**	**0.719**	**0.312**	0.136 U	**0.475**	**1.24**	**0.807**	**0.346**	**0.353**	0.136 U	**0.549**	**1.1**	**0.712**	**0.59**	**0.556**	0.136 U	**0.475**
Methylene Chloride	UG/M3	**2.61**	**13**	1.74 U	**2.08**	1.74 U	**8.44**	**3.24**	**3.58**	1.74 U	1.74 U	**23.3**	**6.18**	**3.35**	**4.34**	1.74 U	1.74 U	**26.3**	**27.7**	1.74 U	**10.8**
Vinyl Chloride	UG/M3	0.051 U	0.051 U	**0.072**	0.051 U	**0.079**	0.051 U	0.051 U	0.051 U	**0.084**	**0.11**	0.051 U	**0.074**	0.051 U	**0.079**	**0.051**	**0.079**	**0.067**	**0.061**	0.051 U	0.051 U
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	0.983 U	**2.02**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	**2.11**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	**2.63**
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	0.934 U	0.934 U	0.934 U	**1.14**	0.934 U	0.934 U	0.934 U	0.934 U	**1.08**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**1.07**	0.934 U	0.934 U	0.934 U	0.934 U
2-Hexanone	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
4-Ethyltoluene	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
Acetone	UG/M3	**7.74**	**16.8**	**7.08**	**6.84**	**18**	**6.37**	**19.9**	**14.9**	**8.05**	**17.3**	**11.1**	**34**	**16.8**	**15.1**	**8.98**	**17**	**13.2**	**14.3**	**8.24**	**22.9**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	UG/M3	0.639 U	0.639 U	0.639 U	**0.668**	0.639 U	**0.661**	0.639 U	0.639 U	**0.649**	0.639 U	**0.684**	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	**0.677**	**0.735**	0.639 U	0.639 U
Benzyl Chloride	UG/M3	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoform	UG/M3	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U
Chlorobenzene	UG/M3	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U
Chloromethane	UG/M3	**1.16**	**1.24**	**0.927**	**1.28**	**1.07**	**1.01**	**1.15**	**1.29**	**1.29**	**1.07**	**1.05**	**0.902**	**1.21**	**1.26**	**1.25**	**1.03**	**0.981**	**1.08**	**1.18**	**1.26**
Cis-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	UG/M3	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	**12.4**	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U
Dibromochloromethane	UG/M3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**1.96**	**2.18**	**2.41**	**2.12**	**2.05**	**2.23**	**2.25**	**2.22**	**2.34**	**2.01**	**2.16**	**2.25**	**1.79**	**2.18**	**2.19**	**2.06**	**2.22**	**2.42**	**1.64**	**2.27**
Ethanol	UG/M3	**24.9**	**78.6**	**12.4**	**37.7**	**192**	**19.8**	**139**	**45.2**	**40.5**	**166**	**36.6**	**46.9**	**97.2**	**44.8**	**39.9**	**170**	**36.6**	**38.6**	**61.6**	**84.2**
Ethyl Acetate	UG/M3	1.8 U	1.8 U	1.8 U	1.8 U	**1.85**	1.8 U	1.8 U	1.8 U	1.8 U	**1.9**	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	**1.82**	1.8 U	1.8 U	1.8 U	**3.08**
Ethylbenzene	UG/M3	0.869 U	0.869 U	**4.43**	**1.28**	**1.59**	0.869 U	0.869 U	0.869 U	**1.11**	**1.23**	0.869 U	0.869 U	0.869 U	0.869 U	**1.24**	**1.17**	0.869 U	0.869 U	0.869 U	0.869 U
Hexachlorobutadiene	UG/M3	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Isopropanol	UG/M3	**2.73**	**185**	**2.45**	**4.57**	**245**	**17.9**	**29.5**	**8.65**	**5.33**	**205**	**33.2**	**24.2**	**45.7**	**30.7**	**5.26**	**211**	**33.2**	**34.2**	**59.5**	**347**
m,p-Xylene	UG/M3	1.74 U	1.74 U	**19.9**	**5.21**	**7.51**	1.74 U	1.74 U	**2.44**	**4.6**	**5.73**	1.74 U	1.74 U	1.74 U	1.74 U	**5**	**5.56**	1.74 U	1.74 U	1.74 U	1.74 U
Methyl Ethyl Ketone (2-Butanone)	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	2.05 U	**3.07**	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	**2.58**	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	**2.5**
N-Heptane	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	**1.39**
N-Hexane	UG/M3	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	**0.722**	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U
O-Xylene (1,2-Dimethylbenzene)	UG/M3	0.869 U	0.869 U	**5.82**	**1.66**	**2.48**	0.869 U	0.869 U	**1.05**	**1.48**	**1.91**	0.869 U	0.869 U	0.869 U	0.869 U	**1.61**	**1.84**	0.869 U	0.869 U	0.869 U	0.869 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-7	IA-7	IA-8	IA-8	IA-8	IA-8	IA-8	IA-8	IA-9	IA-9	IA-9	IA-9	IA-9	IA-9	IA-10	IA-10	IA-10	IA-10	IA-10	IA-10
Sample Date:		03/04/2021	04/12/2021	12/03/2019	03/17/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	03/17/2020	09/08/2020	11/19/2020	02/04/2021	03/04/2021	04/12/2021	03/17/2020	09/08/2020	11/19/2020	11/19/2020	03/04/2021	04/12/2021
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Parameter	Unit																				
Styrene	UG/M3	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	**0.924**	0.852 U	0.852 U	0.852 U	**1.3**	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U
Tert-Butyl Alcohol	UG/M3	1.52 U	1.52 U	1.52 U	1.52 U	**4.34**	1.52 U	1.52 U	1.52 U	1.52 U	**3.58**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	**3.43**	1.52 U	1.52 U	1.52 U	1.52 U
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**2.06**	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**2.84**
Toluene	UG/M3	**1.22**	**7.65**	**0.984**	**2.24**	**38.1**	**1.77**	**1.3**	**6.71**	**2.25**	**29.7**	**4.11**	**2.29**	**1.67**	**5.2**	**2.02**	**30.4**	**3.75**	**3.92**	**1.94**	**5.69**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	**1.24**	**1.31**	**1.37**	**1.14**	1.12 U	**1.25**	1.12 U	**1.34**	**1.34**	1.12 U	**1.29**	**1.16**	**1.14**	**1.38**	**1.36**	1.12 U	**1.25**	**1.32**	**1.19**	**1.41**
Vinyl Bromide	UG/M3	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-12	IA-12	IA-12	IA-12	IA-12	IA-13	IA-13	IA-13	IA-13	IA-13	IA-13	IA-14	IA-14	IA-14	IA-14	IA-14	IA-F1C	IA-F1C	IA-F1C	IA-F1C
Sample Date:		03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	04/12/2021	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	01/29/2020	03/17/2020	03/17/2020	11/19/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N
Parameter	Unit																				
Carbon Tetrachloride	UG/M3	**0.384**	**0.434**	**0.465**	**0.56**	**0.403**	**0.396**	**0.478**	**0.465**	**0.465**	**0.409**	**0.415**	**0.396**	**0.447**	**0.459**	**0.541**	**0.396**	**0.403**	**0.39**	**0.403**	**0.453**
1,1,1-Trichloroethane (TCA)	UG/M3	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U
Cis-1,2-Dichloroethylene	UG/M3	**1.41**	**1.54**	**0.373**	0.079 U	**0.087**	**0.932**	**1.63**	**0.496**	0.079 U	0.079 U	0.079 U	**1.27**	**1.52**	**0.638**	0.079 U	0.079 U	0.079 U	**0.456**	**0.492**	**0.722**
1,1-Dichloroethene	UG/M3	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U
Trichloroethylene (TCE)	UG/M3	0.107 U	0.107 U	**0.215**	0.107 U	**0.193**	0.107 U	0.107 U	0.107 U	0.107 U	0.107 U	**0.124**	0.107 U	0.107 U	**0.22**	0.107 U	**0.188**	0.107 U	0.107 U	0.107 U	**0.661**
Tetrachloroethylene (PCE)	UG/M3	**1.15**	**0.719**	**0.264**	0.136 U	**0.387**	**0.698**	**0.719**	**0.325**	0.136 U	**0.454**	**0.441**	**1.46**	**0.726**	**0.332**	0.136 U	**0.515**	**0.251**	**0.807**	**0.821**	**0.441**
Methylene Chloride	UG/M3	1.74 U	1.74 U	**66.7**	**2.91**	**6.46**	1.74 U	1.74 U	**23**	**3.68**	**7.3**	**7.09**	1.74 U	1.74 U	**81.6**	**1.84**	**6.04**	1.74 U	1.74 U	1.74 U	**73.6**
Vinyl Chloride	UG/M3	**0.077**	**0.069**	0.051 U	0.051 U	0.051 U	**0.054**	**0.077**	0.051 U	0.051 U	0.051 U	0.051 U	**0.064**	**0.082**	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	**1.84**	0.983 U	0.983 U	0.983 U	0.983 U	**1.68**	0.983 U	0.983 U	0.983 U	**2.32**	**2.27**	**1.29**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	**1.08**	0.934 U	0.934 U	0.934 U	0.934 U	**1.02**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**1.03**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U
2-Hexanone	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
4-Ethyltoluene	UG/M3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
Acetone	UG/M3	**12.3**	**16.3**	**9.24**	**8.12**	**13**	**12.2**	**16.2**	**12.2**	**11.6**	**15.8**	**15.3**	**10.8**	**16.3**	**16.1**	**7.39**	**13.5**	**4.2**	**8.39**	**8.69**	**19.6**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	UG/M3	**0.652**	0.639 U	**0.834**	0.639 U	0.639 U	0.639 U	0.639 U	**0.677**	0.639 U	0.639 U	0.639 U	**0.69**	0.639 U	**0.716**	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	**0.649**
Benzyl Chloride	UG/M3	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoform	UG/M3	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U
Chlorobenzene	UG/M3	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U
Chloromethane	UG/M3	**1.32**	**1.04**	**0.989**	**1.15**	**1.22**	**1.22**	**1.08**	**1.07**	**1.13**	**1.22**	**1.25**	**1.28**	**1.02**	**1.1**	**1.19**	**1.23**	**1.14**	**1.3**	**1.35**	**1.14**
Cis-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	UG/M3	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	**0.723**	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U
Dibromochloromethane	UG/M3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**2.39**	**2.02**	**2.39**	**1.88**	**2.22**	**2.29**	**2.09**	**2.37**	**1.43**	**2.24**	**2.21**	**2.39**	**1.98**	**2.48**	**1.61**	**2.23**	**1.92**	**2.36**	**2.48**	**2.49**
Ethanol	UG/M3	**46**	**159**	**26.4**	**32.2**	**56.7**	**33.5**	**144**	**23.4**	**409**	**60.1**	**64.3**	**49.4**	**147**	**31.8**	**22.6**	**48**	9.42 U	**29.4**	**32.4**	**51.4**
Ethyl Acetate	UG/M3	1.8 U	**2.17**	1.8 U	1.8 U	1.8 U	1.8 U	**1.9**	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	**1.85**	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Ethylbenzene	UG/M3	**3.31**	**1.18**	0.869 U	0.869 U	0.869 U	**2.28**	**1.08**	0.869 U	0.869 U	0.869 U	0.869 U	**4.29**	**1.13**	0.869 U	0.869 U	0.869 U	**1.47**	**1**	**1.02**	0.869 U
Hexachlorobutadiene	UG/M3	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Isopropanol	UG/M3	**7.47**	**168**	**14.3**	**5.6**	**7.25**	**5.83**	**168**	**17.6**	**128**	**20.6**	**17.1**	**7.87**	**172**	**17**	**3.34**	**24.6**	**1.62**	**5.38**	**4.67**	**37.6**
m,p-Xylene	UG/M3	**13.9**	**5.6**	1.74 U	1.74 U	1.74 U	**9.64**	**5.08**	1.74 U	1.74 U	1.74 U	1.74 U	**16.2**	**5.26**	1.74 U	1.74 U	1.74 U	**6.17**	**4.14**	**4.1**	1.74 U
Methyl Ethyl Ketone (2-Butanone)	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	2.05 U	2.05 U	2.05 U	2.05 U	**2.14**	2.05 U	2.05 U	2.05 U	2.05 U	**3.66**	**3.76**	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U
N-Heptane	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	**0.832**	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
N-Hexane	UG/M3	0.705 U	0.705 U	**0.726**	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	**1.48**
O-Xylene (1,2-Dimethylbenzene)	UG/M3	**4.34**	**1.82**	0.869 U	0.869 U	0.869 U	**3.07**	**1.7**	0.869 U	0.869 U	**0.882**	0.869 U	**5.56**	**1.74**	0.869 U	0.869 U	0.869 U	**1.75**	**1.32**	**1.32**	0.869 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-12	IA-12	IA-12	IA-12	IA-12	IA-13	IA-13	IA-13	IA-13	IA-13	IA-13	IA-14	IA-14	IA-14	IA-14	IA-14	IA-F1C	IA-F1C	IA-F1C	IA-F1C
Sample Date:		03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	04/12/2021	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	01/29/2020	03/17/2020	03/17/2020	11/19/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N
Parameter	Unit																				
Styrene	UG/M3	**1.86**	0.852 U	0.852 U	0.852 U	**1.38**	**1.62**	0.852 U	0.852 U	0.852 U	**9.2**	**8.77**	**1.41**	0.852 U	0.852 U	0.852 U	**0.911**	0.852 U	0.852 U	0.852 U	0.852 U
Tert-Butyl Alcohol	UG/M3	**2.77**	**3.21**	1.52 U	1.52 U	1.52 U	**1.54**	**3.15**	**2.2**	1.52 U	1.52 U	1.52 U	**2.59**	**3.27**	**1.94**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	**2.45**
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	**1.91**	1.47 U	1.47 U
Toluene	UG/M3	**4.86**	**27.5**	**3.67**	**1.14**	**5.39**	**4.6**	**27.3**	**2.36**	**1.36**	**7.24**	**7.16**	**6.07**	**27.6**	**3.76**	**1.08**	**5.2**	**0.822**	**2.25**	**2.16**	**5.99**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	**1.44**	1.12 U	**1.31**	**1.15**	**1.34**	**1.37**	1.12 U	**1.3**	1.12 U	**1.39**	**1.43**	**1.41**	1.12 U	**1.44**	**1.18**	**1.38**	1.12 U	**1.39**	**1.48**	**1.4**
Vinyl Bromide	UG/M3	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-F1C	IA-F1C	IA-F1C	IA-F1E	IA-F1E	IA-F1W	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2E	IA-F2W	IA-F3C	IA-F3C	IA-F3C	IA-F3C	IA-F3C
Sample Date:		12/06/2020	03/04/2021	04/12/2021	12/03/2019	09/08/2020	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	03/04/2021	04/12/2021	12/03/2019	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	03/04/2021
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit																				
Carbon Tetrachloride	UG/M3	**0.377**	**0.503**	**0.421**	**0.447**	**0.459**	**0.472**	**0.365**	**0.415**	**0.459**	**0.434**	**0.396**	**0.491**	**0.396**	**0.465**	**0.459**	**0.384**	**0.39**	**0.453**	**0.478**	**0.572**
1,1,1-Trichloroethane (TCA)	UG/M3	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U	0.109 U
Cis-1,2-Dichloroethylene	UG/M3	**1.13**	0.079 U	0.079 U	**0.547**	**0.127**	**0.381**	0.079 U	**0.309**	**0.139**	**0.714**	**0.603**	0.079 U	0.079 U	**0.813**	**0.408**	**0.119**	**0.329**	**0.091**	**0.777**	0.079 U
1,1-Dichloroethene	UG/M3	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U
Trichloroethylene (TCE)	UG/M3	**1.81**	**0.183**	**0.183**	**0.226**	0.107 U	**0.161**	0.107 U	0.107 U	0.107 U	**0.236**	**0.344**	0.107 U	**0.134**	**0.285**	**0.107**	0.107 U	0.107 U	0.107 U	**0.296**	0.107 U
Tetrachloroethylene (PCE)	UG/M3	**1.76**	0.136 U	**0.38**	**3.62**	**0.481**	**1.78**	**0.136**	**0.685**	**0.529**	**0.427**	**0.834**	0.136 U	**0.529**	**3.28**	**1.27**	**0.285**	**0.631**	**0.468**	**0.448**	0.136 U
Methylene Chloride	UG/M3	**84.4**	**5.11**	**9.1**	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	**48.6**	**35.1**	**2.31**	**4.38**	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	**47.2**	**2.44**
Vinyl Chloride	UG/M3	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	**0.102**	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	**6.93**	**1.01**	**2.4**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	**1.85**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	0.934 U	0.934 U	0.934 U	**1.23**	0.934 U	0.934 U	0.934 U	**0.967**	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	**0.972**	0.934 U	0.934 U
2-Hexanone	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
4-Ethyltoluene	UG/M3	**1.26**	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
Acetone	UG/M3	**32.3**	**24.7**	**22.6**	**5.7**	**15.6**	**5.08**	**5.8**	**7.6**	**9.67**	**12.4**	**12.4**	**10.9**	**11.9**	**6.06**	**5.34**	**3.52**	**9.12**	**8.77**	**17.6**	**10**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	UG/M3	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	0.639 U	**0.658**
Benzyl Chloride	UG/M3	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoform	UG/M3	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U	0.623 U
Chlorobenzene	UG/M3	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U	0.977 U
Chloromethane	UG/M3	**1**	**1.88**	**1.2**	**0.983**	**1.01**	**1.38**	**1.1**	**1.31**	**0.989**	**1.02**	**1.12**	**1.13**	**1.24**	**1.08**	**0.919**	**1.11**	**1.36**	**1.01**	**1.07**	**1.21**
Cis-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	UG/M3	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U
Dibromochloromethane	UG/M3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**1.94**	**1.51**	**2.2**	**2.28**	**2.02**	**2.45**	**1.93**	**2.4**	**1.97**	**2.45**	**1.91**	**2.19**	**2.23**	**2.37**	**2.46**	**1.91**	**2.45**	**2.01**	**2.36**	**1.67**
Ethanol	UG/M3	**45.6**	**37.3**	**38.8**	**19**	**335**	**19**	9.42 U	**26.8**	**111**	**34.1**	**20.2**	**25.1**	**35.4**	**49.6**	**38.4**	**11.3**	**32.6**	**154**	**71.6**	**60.7**
Ethyl Acetate	UG/M3	1.8 U	1.8 U	1.8 U	1.8 U	**4.47**	1.8 U	1.8 U	1.8 U	**2.98**	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	**4.65**	1.8 U	1.8 U
Ethylbenzene	UG/M3	**1.79**	0.869 U	0.869 U	**1.36**	**1.43**	**1.15**	**1.17**	0.869 U	**1.1**	0.869 U	0.869 U	0.869 U	0.869 U	**1.75**	**1.34**	**5.34**	**1.87**	**1.12**	0.869 U	0.869 U
Hexachlorobutadiene	UG/M3	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Isopropanol	UG/M3	**30.5**	**11.4**	**5.19**	**2.45**	**337**	**2.23**	**1.27**	**5.14**	**34.4**	**24.5**	**9.93**	**4.62**	**7.18**	**3.15**	**1.89**	**2.05**	**5.56**	**37.4**	**56.3**	**8.41**
m,p-Xylene	UG/M3	**8.99**	1.74 U	**2.05**	**5.91**	**6.69**	**5.04**	**4.78**	**2.3**	**5.13**	1.74 U	**1.95**	1.74 U	**2.77**	**7.38**	**6.08**	**22.4**	**7.69**	**5.04**	1.74 U	1.74 U
Methyl Ethyl Ketone (2-Butanone)	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	**5.82**	2.05 U	**3.58**	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	**2.13**	2.05 U	2.05 U
N-Heptane	UG/M3	0.82 U	0.82 U	0.82 U	0.82 U	**1.11**	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	**0.979**	0.82 U	0.82 U
N-Hexane	UG/M3	0.705 U	0.705 U	0.705 U	0.705 U	**0.846**	0.705 U	0.705 U	0.705 U	0.705 U	**1.25**	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U	0.705 U
O-Xylene (1,2-Dimethylbenzene)	UG/M3	**3.32**	0.869 U	**1.08**	**1.97**	**2.13**	**1.74**	**1.37**	0.869 U	**1.63**	0.869 U	0.869 U	0.869 U	**1.08**	**2.51**	**2.05**	**6.39**	**2.35**	**1.65**	0.869 U	0.869 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-F1C	IA-F1C	IA-F1C	IA-F1E	IA-F1E	IA-F1W	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2C	IA-F2E	IA-F2W	IA-F3C	IA-F3C	IA-F3C	IA-F3C	IA-F3C
Sample Date:		12/06/2020	03/04/2021	04/12/2021	12/03/2019	09/08/2020	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	03/04/2021	04/12/2021	12/03/2019	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	03/04/2021
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit																				
Styrene	UG/M3	0.852 U	0.852 U	**1.56**	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U
Tert-Butyl Alcohol	UG/M3	1.52 U	1.52 U	1.52 U	1.52 U	**4.97**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	**2.58**	**1.86**	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Toluene	UG/M3	**26.5**	**4.11**	**6.29**	**0.976**	**34**	0.754 U	**0.908**	**2.46**	**8.93**	**2.93**	**3.21**	**0.878**	**3.7**	**0.931**	0.754 U	**0.799**	**2.27**	**9.61**	**3.5**	**1.59**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	1.12 U	1.12 U	**1.35**	**1.43**	1.12 U	**1.42**	1.12 U	**1.49**	1.12 U	**1.31**	1.12 U	**1.23**	**1.34**	**1.26**	**1.42**	1.12 U	**1.53**	1.12 U	**1.3**	**1.29**
Vinyl Bromide	UG/M3	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-F3C	IA-F3E	IA-F3W	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-7	SS-8
Sample Date:		04/12/2021	12/03/2019	12/03/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	12/03/2019	03/17/2020	12/03/2019
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit												
Carbon Tetrachloride	UG/M3	**0.428**	**0.459**	**0.415**	1.57 U	1.8 U	4.2 U	9 U	1.8 U	3.5 U	1.26 U	1.26 U	1.26 U
1,1,1-Trichloroethane (TCA)	UG/M3	0.109 U	0.109 U	0.109 U	1.36 U	1.56 U	3.64 U	7.8 U	1.56 U	3.03 U	1.09 U	1.09 U	1.09 U
Cis-1,2-Dichloroethylene	UG/M3	0.079 U	**0.757**	**0.884**	**28.4**	1.13 U	**70.6**	**36.2**	**101**	2.2 U	**2.03**	**1.44**	0.793 U
1,1-Dichloroethene	UG/M3	0.079 U	0.079 U	0.079 U	0.991 U	1.13 U	2.64 U	5.67 U	1.13 U	2.2 U	0.793 U	0.793 U	0.793 U
Trichloroethylene (TCE)	UG/M3	0.107 U	**0.193**	**0.231**	**7.9**	1.54 U	**11**	**200**	**8.06**	2.99 U	**17.5**	**14**	1.07 U
Tetrachloroethylene (PCE)	UG/M3	**0.468**	**2.71**	**3.21**	**67.5**	**22.9**	**71.2**	**2540**	**11.7**	**48.7**	**629**	**491**	**132**
Methylene Chloride	UG/M3	**4.03**	1.74 U	1.74 U	**3.39**	2.48 U	**9.03**	12.4 U	**2.99**	4.83 U	1.74 U	1.74 U	1.74 U
Vinyl Chloride	UG/M3	0.051 U	**0.067**	**0.056**	**16.7**	0.731 U	**111**	3.66 U	**110**	1.42 U	0.511 U	0.511 U	0.511 U
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	1.37 U	1.37 U	1.72 U	1.96 U	4.58 U	9.82 U	1.96 U	3.82 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	1.53 U	1.53 U	1.92 U	2.19 U	5.11 U	11 U	2.19 U	4.26 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.09 U	1.09 U	1.36 U	1.56 U	3.64 U	7.8 U	1.56 U	3.03 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	1.01 U	1.16 U	2.7 U	5.79 U	1.16 U	2.25 U	0.809 U	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	1.48 U	1.48 U	1.86 U	2.12 U	4.95 U	10.6 U	2.12 U	4.13 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	0.983 U	0.983 U	0.983 U	**2.12**	**1.94**	**8.11**	7.03 U	**1.88**	2.73 U	**2.21**	**3.49**	**1.05**
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	1.54 U	1.54 U	1.92 U	2.2 U	5.13 U	11 U	2.2 U	4.27 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.5 U	1.72 U	4.01 U	8.6 U	1.72 U	3.34 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	0.809 U	0.809 U	1.01 U	1.16 U	2.7 U	5.79 U	1.16 U	2.25 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	0.924 U	0.924 U	1.16 U	1.32 U	3.08 U	6.61 U	1.32 U	2.57 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	1.4 U	1.4 U	1.75 U	2 U	4.66 U	10 U	2 U	3.89 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	0.983 U	0.983 U	1.23 U	1.41 U	**4.82**	7.03 U	1.41 U	2.73 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	UG/M3	0.442 U	0.442 U	0.442 U	**1.46**	0.633 U	1.48 U	3.16 U	**1.41**	1.23 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.5 U	1.72 U	4.01 U	8.6 U	1.72 U	3.34 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	1.2 U	1.2 U	1.5 U	1.72 U	4.01 U	8.6 U	1.72 U	3.34 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	0.721 U	0.721 U	**5.48**	**1.17**	2.4 U	5.15 U	**1.23**	2 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	UG/M3	0.934 U	0.934 U	0.934 U	1.17 U	**2.88**	3.12 U	6.68 U	**6.31**	**5.42**	**1.74**	**1.55**	0.934 U
2-Hexanone	UG/M3	0.82 U	0.82 U	0.82 U	1.02 U	**3.72**	2.73 U	5.86 U	**3.77**	2.28 U	0.82 U	**1.87**	0.82 U
4-Ethyltoluene	UG/M3	0.983 U	0.983 U	0.983 U	1.23 U	1.41 U	3.28 U	7.03 U	1.41 U	2.73 U	0.983 U	**1.11**	0.983 U
Acetone	UG/M3	**13.5**	**6.41**	**5.49**	**651**	**820**	**1710**	**634**	**753**	**1500**	**451**	**349**	**204**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	0.626 U	0.626 U	0.783 U	0.895 U	2.09 U	4.48 U	0.895 U	1.74 U	0.626 U	0.626 U	0.626 U
Benzene	UG/M3	0.639 U	0.639 U	0.639 U	**27.5**	**3.32**	**72.5**	**6.96**	**9.58**	**2.25**	**2.3**	**1.29**	0.639 U
Benzyl Chloride	UG/M3	1.04 U	1.04 U	1.04 U	1.29 U	1.48 U	3.45 U	7.4 U	1.48 U	2.88 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	1.34 U	1.34 U	1.67 U	1.92 U	4.47 U	9.58 U	1.92 U	3.72 U	1.34 U	1.34 U	1.34 U
Bromoform	UG/M3	2.07 U	2.07 U	2.07 U	2.58 U	2.96 U	6.9 U	14.8 U	2.96 U	5.75 U	2.07 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	0.777 U	0.777 U	0.971 U	1.11 U	2.59 U	5.55 U	1.11 U	2.16 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	0.623 U	0.623 U	**12.7**	**3.24**	**204**	4.45 U	**16.8**	1.73 U	0.623 U	0.623 U	0.623 U
Chlorobenzene	UG/M3	0.921 U	0.921 U	0.921 U	1.15 U	1.32 U	3.07 U	6.59 U	1.32 U	2.56 U	0.921 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.528 U	0.528 U	0.66 U	0.755 U	1.76 U	3.77 U	0.755 U	1.47 U	0.528 U	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	0.977 U	0.977 U	**9.77**	1.4 U	3.26 U	**17**	1.4 U	**5.18**	**2.82**	**2.87**	**1.53**
Chloromethane	UG/M3	**1.19**	**0.96**	**1.01**	**4.83**	0.591 U	1.38 U	2.95 U	**1.18**	1.15 U	0.413 U	0.413 U	0.413 U
Cis-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	1.13 U	1.3 U	3.03 U	6.49 U	1.3 U	2.52 U	0.908 U	0.908 U	0.908 U
Cyclohexane	UG/M3	0.688 U	0.688 U	0.688 U	**15.8**	**2.17**	**120**	4.92 U	**4.41**	**2.72**	**2.35**	**1.67**	0.688 U
Dibromochloromethane	UG/M3	1.7 U	1.7 U	1.7 U	2.13 U	2.44 U	5.68 U	12.2 U	2.44 U	4.74 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**2.25**	**2.41**	**2.3**	**2.84**	**2.95**	3.3 U	7.07 U	**2.28**	2.75 U	**2.37**	**2.17**	**2.26**
Ethanol	UG/M3	**36**	**21.1**	**24.1**	**379**	**177**	**220**	**114**	**241**	**230**	**599**	**614**	**464**
Ethyl Acetate	UG/M3	1.8 U	1.8 U	1.8 U	2.25 U	2.57 U	6.02 U	12.9 U	2.57 U	5.01 U	1.8 U	**14.2**	1.8 U
Ethylbenzene	UG/M3	0.869 U	**0.986**	**1.6**	**3.14**	**3.5**	**7.86**	6.21 U	**3.45**	**2.94**	**2.69**	**3.14**	**1.38**
Hexachlorobutadiene	UG/M3	2.13 U	2.13 U	2.13 U	2.67 U	3.05 U	7.11 U	15.3 U	3.05 U	5.93 U	2.13 U	2.13 U	2.13 U
Isopropanol	UG/M3	**10.9**	**2.16**	**2.75**	**33.2**	**27.8**	**32.4**	**42.3**	**38.6**	**41.3**	**18.3**	**26.1**	**6.07**
m,p-Xylene	UG/M3	**1.78**	**4.56**	**6.6**	**12.1**	**13.1**	**21.8**	12.4 U	**11.9**	**10.5**	**12**	**12.6**	**5.99**
Methyl Ethyl Ketone (2-Butanone)	UG/M3	1.47 U	1.47 U	1.47 U	**31**	**49.8**	**43.9**	**33**	**52.2**	**50.1**	**17.3**	**23.5**	**4.66**
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	2.05 U	2.05 U	2.05 U	**18.3**	**12**	6.84 U	14.6 U	**16.4**	**14.5**	2.05 U	**2.64**	2.05 U
N-Heptane	UG/M3	0.82 U	0.82 U	0.82 U	**37.5**	**3.41**	**60.7**	5.86 U	**6.31**	**3.06**	**1.45**	**1.52**	0.82 U
N-Hexane	UG/M3	0.705 U	0.705 U	0.705 U	**125**	**7.65**	**130**	**6.98**	**16**	**5.57**	**1.72**	**1.28**	0.705 U
O-Xylene (1,2-Dimethylbenzene)	UG/M3	0.869 U	**1.5**	**2.19**	**2.56**	**2.84**	**9.82**	6.21 U	**2.71**	2.42 U	**3.46**	**4.16**	**1.69**

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		IA-F3C	IA-F3E	IA-F3W	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-7	SS-8
Sample Date:		04/12/2021	12/03/2019	12/03/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	12/03/2019	03/17/2020	12/03/2019
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit												
Styrene	UG/M3	0.852 U	0.852 U	0.852 U	1.06 U	1.22 U	2.84 U	6.09 U	**1.46**	2.37 U	**1.66**	**3.34**	0.852 U
Tert-Butyl Alcohol	UG/M3	1.52 U	**1.55**	**2.14**	**15.9**	**16.6**	**17.8**	**12.3**	**11.6**	**15.6**	**12.3**	**15.4**	**4.06**
Tert-Butyl Methyl Ether	UG/M3	0.721 U	0.721 U	0.721 U	0.901 U	1.03 U	2.4 U	5.16 U	1.03 U	2 U	0.721 U	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	1.47 U	1.47 U	1.47 U	1.84 U	2.11 U	4.93 U	10.5 U	**3.42**	4.1 U	1.47 U	**33.9**	1.47 U
Toluene	UG/M3	**3.99**	0.754 U	**1.07**	**15.6**	**11.7**	**39.9**	**12.4**	**16.1**	**9.46**	**5.54**	**11.5**	**0.829**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	0.793 U	0.793 U	**2.47**	1.13 U	**8.92**	5.67 U	**2.97**	2.2 U	0.793 U	0.793 U	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	0.908 U	0.908 U	1.13 U	1.3 U	3.03 U	6.49 U	1.3 U	2.52 U	0.908 U	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	**1.37**	**1.37**	**1.16**	**2.44**	**13.7**	3.75 U	**15.1**	1.61 U	**6.69**	**15.3**	**5.09**	**1.48**
Vinyl Bromide	UG/M3	0.874 U	0.874 U	0.874 U	1.09 U	1.25 U	2.92 U	6.25 U	1.25 U	2.43 U	0.874 U	0.874 U	0.874 U

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

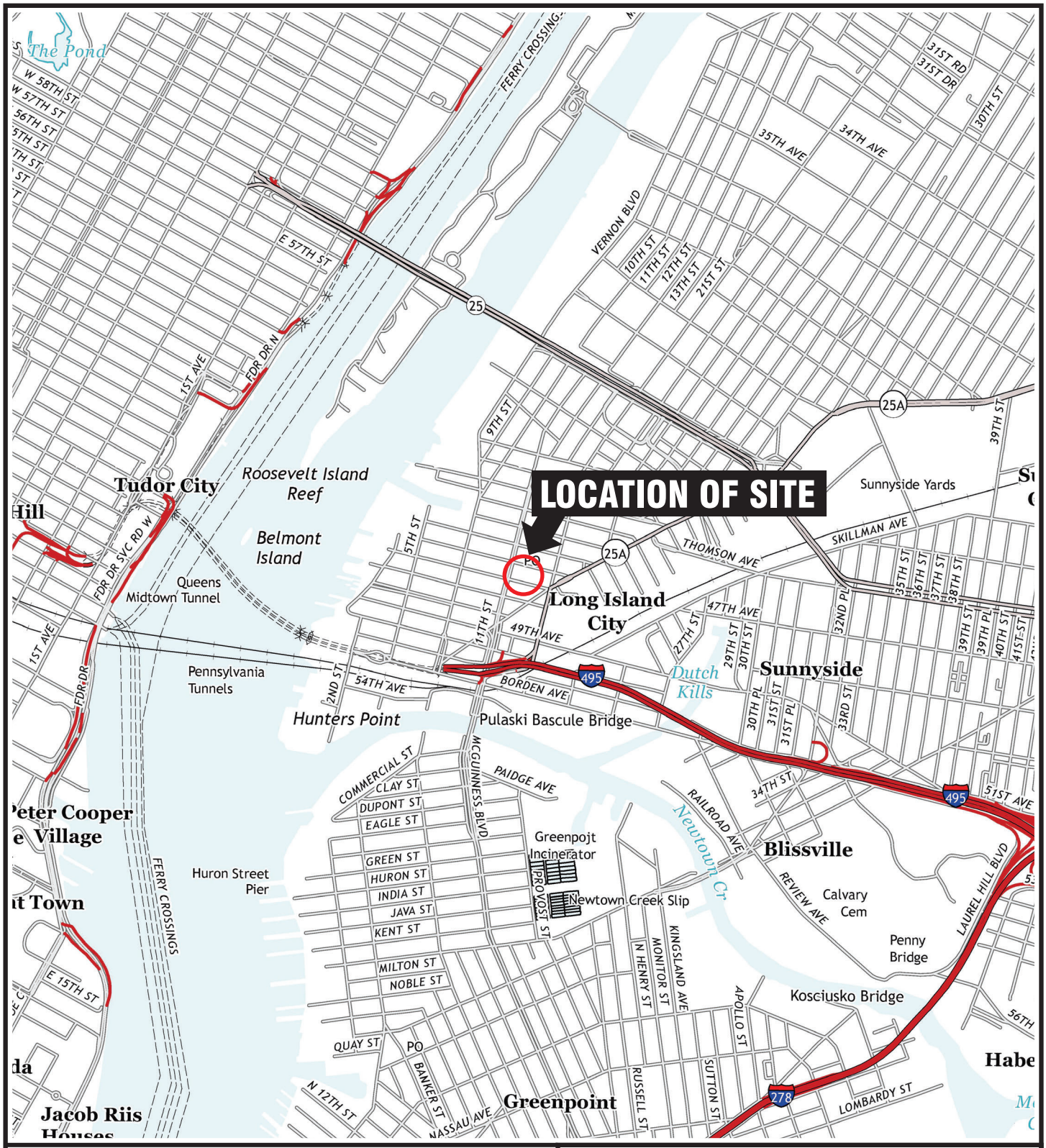
Sample Designation:		SS-8	SS-9	SS-9	SS-10	SS-10	SS-11	SS-11	SS-12	SS-12	SV-13	SV-14	SV-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21
Sample Date:		03/18/2020	12/03/2019	03/18/2020	03/17/2020	12/03/2019	12/03/2019	03/17/2020	12/03/2019	03/17/2020	01/16/2020	01/16/2020	01/16/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit																		
Carbon Tetrachloride	UG/M3	1.26 U	2.09 U	1.26 U	1.26 U	4.2 U	2.52 U	1.26 U	1.26 U	1.26 U	1.57 U	1.26 U	1.26 U	1.26 U	1.26 U	7.86 U	5.72 U	1.26 U	1.26 U
1,1,1-Trichloroethane (TCA)	UG/M3	1.09 U	1.82 U	1.09 U	1.09 U	3.64 U	2.18 U	1.09 U	1.09 U	1.09 U	1.36 U	1.09 U	1.09 U	1.09 U	1.09 U	6.82 U	4.96 U	1.09 U	1.09 U
Cis-1,2-Dichloroethylene	UG/M3	0.793 U	**5.23**	**8.17**	**1.39**	2.64 U	1.59 U	0.793 U	0.793 U	0.793 U	0.991 U	0.793 U	0.793 U	**28.7**	**0.793**	**120**	**75.7**	**47.6**	**2.12**
1,1-Dichloroethene	UG/M3	0.793 U	1.32 U	0.793 U	0.793 U	2.64 U	1.59 U	0.793 U	0.793 U	0.793 U	0.991 U	0.793 U	0.793 U	0.793 U	0.793 U	4.96 U	3.6 U	0.793 U	0.793 U
Trichloroethylene (TCE)	UG/M3	1.07 U	1.79 U	**2.89**	**10.9**	**8.22**	2.15 U	**2.64**	**1.88**	**1.65**	1.34 U	1.07 U	1.07 U	**131**	1.07 U	**22**	**129**	**10.1**	**3.53**
Tetrachloroethylene (PCE)	UG/M3	**95.6**	**25.6**	**116**	**203**	**189**	**56.1**	**27.4**	**51.1**	**38.9**	1.7 U	1.36 U	1.36 U	**970**	**9.15**	**82.7**	**2420**	**98.3**	**66.1**
Methylene Chloride	UG/M3	1.74 U	2.9 U	1.74 U	1.74 U	5.8 U	3.47 U	1.74 U	1.74 U	1.74 U	2.17 U	1.74 U	1.74 U	1.74 U	1.74 U	10.8 U	7.89 U	1.74 U	1.74 U
Vinyl Chloride	UG/M3	0.511 U	**2.58**	**2.63**	0.511 U	1.71 U	1.02 U	0.511 U	0.511 U	0.511 U	**0.69**	0.511 U	0.511 U	**0.78**	0.511 U	**43.7**	2.32 U	**21.4**	0.511 U
1,1,2,2-Tetrachloroethane	UG/M3	1.37 U	2.29 U	1.37 U	1.37 U	4.58 U	2.75 U	1.37 U	1.37 U	1.37 U	1.72 U	1.37 U	1.37 U	1.37 U	1.37 U	8.58 U	6.24 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	1.53 U	2.55 U	1.53 U	1.53 U	5.11 U	3.07 U	1.53 U	1.53 U	1.53 U	1.92 U	1.53 U	1.53 U	1.53 U	1.53 U	9.58 U	6.97 U	1.53 U	1.53 U
1,1,2-Trichloroethane	UG/M3	1.09 U	1.82 U	1.09 U	1.09 U	3.64 U	2.18 U	1.09 U	1.09 U	1.09 U	1.36 U	1.09 U	1.09 U	1.09 U	1.09 U	6.82 U	4.96 U	1.09 U	1.09 U
1,1-Dichloroethane	UG/M3	0.809 U	1.35 U	0.809 U	0.809 U	2.7 U	1.62 U	0.809 U	0.809 U	0.809 U	1.01 U	0.809 U	0.809 U	0.809 U	0.809 U	5.06 U	3.68 U	0.809 U	0.809 U
1,2,4-Trichlorobenzene	UG/M3	1.48 U	2.47 U	1.48 U	1.48 U	4.95 U	2.97 U	1.48 U	1.48 U	1.48 U	1.86 U	1.48 U	1.48 U	1.48 U	1.48 U	9.28 U	6.75 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	UG/M3	**1.94**	1.64 U	**3.19**	**3.65**	3.28 U	1.97 U	**1.76**	0.983 U	**2.58**	1.23 U	0.983 U	0.983 U	**3.87**	**1.5**	6.15 U	4.47 U	**3.88**	**3.28**
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	1.54 U	2.56 U	1.54 U	1.54 U	5.13 U	3.07 U	1.54 U	1.54 U	1.54 U	1.92 U	1.54 U	1.54 U	1.54 U	1.54 U	9.61 U	6.99 U	1.54 U	1.54 U
1,2-Dichlorobenzene	UG/M3	1.2 U	2 U	1.2 U	1.2 U	4.01 U	2.4 U	1.2 U	1.2 U	1.2 U	1.5 U	1.2 U	1.2 U	1.2 U	1.2 U	7.52 U	5.47 U	1.2 U	1.2 U
1,2-Dichloroethane	UG/M3	0.809 U	1.35 U	**0.858**	0.809 U	2.7 U	1.62 U	0.809 U	0.809 U	0.809 U	1.01 U	0.809 U	0.809 U	0.809 U	0.809 U	5.06 U	3.68 U	0.809 U	0.809 U
1,2-Dichloropropane	UG/M3	0.924 U	1.54 U	0.924 U	0.924 U	3.08 U	1.85 U	0.924 U	0.924 U	0.924 U	1.16 U	0.924 U	0.924 U	0.924 U	0.924 U	5.78 U	4.2 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	UG/M3	1.4 U	2.33 U	1.4 U	1.4 U	4.66 U	2.8 U	1.4 U	1.4 U	1.4 U	1.75 U	1.4 U	1.4 U	1.4 U	1.4 U	8.74 U	6.35 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	0.983 U	1.64 U	**1.11**	0.983 U	3.28 U	1.97 U	0.983 U	0.983 U	0.983 U	1.23 U	0.983 U	0.983 U	0.983 U	0.983 U	6.15 U	4.47 U	0.983 U	**1.13**
1,3-Butadiene	UG/M3	0.442 U	0.737 U	0.442 U	0.442 U	1.48 U	0.885 U	0.442 U	0.442 U	0.442 U	0.553 U	0.442 U	0.442 U	0.442 U	0.442 U	2.77 U	2.01 U	0.442 U	0.442 U
1,3-Dichlorobenzene	UG/M3	1.2 U	2 U	1.2 U	1.2 U	4.01 U	2.4 U	1.2 U	1.2 U	1.2 U	1.5 U	1.2 U	1.2 U	1.2 U	1.2 U	7.52 U	5.47 U	1.2 U	1.2 U
1,4-Dichlorobenzene	UG/M3	1.2 U	2 U	1.2 U	1.2 U	4.01 U	2.4 U	1.2 U	1.2 U	1.2 U	**6.55**	**8.36**	**9.38**	1.2 U	1.2 U	7.52 U	5.47 U	1.2 U	1.2 U
1,4-Dioxane (P-Dioxane)	UG/M3	0.721 U	1.2 U	0.721 U	**0.89**	2.4 U	1.44 U	0.721 U	0.721 U	0.721 U	0.901 U	0.721 U	0.721 U	**1.08**	0.721 U	4.5 U	3.28 U	**1.34**	**0.742**
2,2,4-Trimethylpentane	UG/M3	0.934 U	**2.32**	**1.3**	0.934 U	3.12 U	1.87 U	**1.18**	0.934 U	0.934 U	1.17 U	0.934 U	0.934 U	**1.08**	**0.976**	5.84 U	**6.07**	**1.33**	**5.79**
2-Hexanone	UG/M3	0.82 U	1.36 U	0.82 U	**0.861**	2.73 U	1.64 U	0.82 U	0.82 U	0.82 U	1.02 U	0.82 U	0.82 U	0.82 U	0.82 U	5.12 U	3.73 U	**3.09**	**4.22**
4-Ethyltoluene	UG/M3	0.983 U	1.64 U	**1.08**	0.983 U	3.28 U	1.97 U	0.983 U	0.983 U	0.983 U	1.23 U	0.983 U	0.983 U	**1.51**	0.983 U	6.15 U	4.47 U	**0.993**	**1.2**
Acetone	UG/M3	**210**	**691**	**532**	**160**	**399**	**337**	**111**	**6.27**	**5.23**	**831**	**504**	**71.7**	**527**	**575**	**361**	**796**	**874**	**917**
Allyl Chloride (3-Chloropropene)	UG/M3	0.626 U	1.04 U	0.626 U	0.626 U	2.09 U	1.25 U	0.626 U	0.626 U	0.626 U	0.783 U	0.626 U	0.626 U	0.626 U	0.626 U	3.91 U	2.85 U	0.626 U	0.626 U
Benzene	UG/M3	0.639 U	**2.77**	**2.86**	**0.664**	2.13 U	1.28 U	**0.91**	0.639 U	0.639 U	**1.05**	**0.93**	0.639 U	**1.37**	**0.872**	**22.3**	2.9 U	**5.53**	**5.65**
Benzyl Chloride	UG/M3	1.04 U	1.72 U	1.04 U	1.04 U	3.45 U	2.07 U	1.04 U	1.04 U	1.04 U	1.29 U	1.04 U	1.04 U	1.04 U	1.04 U	6.47 U	4.71 U	1.04 U	1.04 U
Bromodichloromethane	UG/M3	1.34 U	2.23 U	1.34 U	1.34 U	4.47 U	2.68 U	1.34 U	1.34 U	1.34 U	1.67 U	1.34 U	1.34 U	1.34 U	1.34 U	8.37 U	6.09 U	1.34 U	1.34 U
Bromoform	UG/M3	2.07 U	3.44 U	2.07 U	2.07 U	6.9 U	4.14 U	2.07 U	2.07 U	2.07 U	2.58 U	2.07 U	2.07 U	2.07 U	2.07 U	12.9 U	9.4 U	2.07 U	2.07 U
Bromomethane	UG/M3	0.777 U	1.29 U	0.777 U	0.777 U	2.59 U	1.55 U	0.777 U	0.777 U	0.777 U	0.971 U	0.777 U	0.777 U	0.777 U	0.777 U	4.85 U	3.53 U	0.777 U	0.777 U
Carbon Disulfide	UG/M3	0.623 U	**1.73**	**0.841**	0.623 U	2.08 U	1.25 U	0.623 U	0.623 U	0.623 U	**2.31**	**4.36**	**0.763**	**1.64**	**0.701**	**71.9**	2.83 U	**8.31**	**6.98**
Chlorobenzene	UG/M3	0.921 U	1.53 U	0.921 U	0.921 U	3.07 U	1.84 U	0.921 U	0.921 U	0.921 U	1.15 U	0.921 U	0.921 U	0.921 U	0.921 U	5.76 U	4.19 U	0.921 U	0.921 U
Chloroethane	UG/M3	0.528 U	0.879 U	0.528 U	0.528 U	1.76 U	1.06 U	0.528 U	0.528 U	0.528 U	0.66 U	0.528 U	0.528 U	0.528 U	0.528 U	3.3 U	2.4 U	0.528 U	0.528 U
Chloroform	UG/M3	0.977 U	1.63 U	**1.3**	**3.35**	**4.2**	**3.65**	**2.05**	**5.52**	**2.01**	1.22 U	0.977 U	0.977 U	**6.3**	**1.64**	6.1 U	**10**	**1.8**	0.977 U
Chloromethane	UG/M3	0.413 U	0.688 U	**1.03**	**2.11**	1.38 U	0.826 U	**1.13**	0.413 U	**0.632**	0.516 U	0.413 U	0.413 U	0.413 U	**0.973**	2.58 U	1.88 U	0.413 U	**0.591**
Cis-1,3-Dichloropropene	UG/M3	0.908 U	1.51 U	0.908 U	0.908 U	3.03 U	1.82 U	0.908 U	0.908 U	0.908 U	1.13 U	0.908 U	0.908 U	0.908 U	0.908 U	5.67 U	4.13 U	0.908 U	0.908 U
Cyclohexane	UG/M3	**0.881**	**5.78**	**2.04**	**1.36**	2.3 U	**1.56**	**1.21**	**5.34**	0.688 U	0.861 U	**0.699**	0.688 U	**2.18**	**0.83**	**70.9**	**3.15**	**3.28**	**3.89**
Dibromochloromethane	UG/M3	1.7 U	2.84 U	1.7 U	1.7 U	5.68 U	3.41 U	1.7 U	1.7 U	1.7 U	2.13 U	1.7 U	1.7 U	1.7 U	1.7 U	10.6 U	7.74 U	1.7 U	1.7 U
Dichlorodifluoromethane	UG/M3	**2.23**	**2.36**	**2.23**	**2.37**	3.3 U	**2.69**	**2.54**	**2.42**	**2.46**	**2.38**	**2.45**	**2.26**	**2.52**	**2.36**	6.18 U	4.49 U	**2.52**	**2.32**
Ethanol	UG/M3	**524**	**774**	**471**	**803**	**1900**	**816**	**205**	**81.6**	9.42 U	11.8 U	9.42 U	9.42 U	**739**	**337**	58.8 U	**443**	**539**	**447**
Ethyl Acetate	UG/M3	1.8 U	3.01 U	1.8 U	1.8 U	6.02 U	3.6 U	1.8 U	1.8 U	1.8 U	2.25 U	1.8 U	1.8 U	1.8 U	1.8 U	11.2 U	8.18 U	1.8 U	1.8 U
Ethylbenzene	UG/M3	**2.05**	**5.34**	**3.21**	**3.18**	2.9 U	**2.08**	**2.09**	**6.21**	**1.66**	**1.48**	**1.64**	**1.71**	**4.43**	**2.04**	5.43 U	3.95 U	**5.13**	**5.08**
Hexachlorobutadiene	UG/M3	2.13 U	3.55 U	2.13 U	2.13 U	7.11 U	4.27 U	2.13 U	2.13 U	2.13 U	2.67 U	2.13 U	2.13 U	2.13 U	2.13 U	13.3 U	9.7 U	2.13 U	2.13 U
Isopropanol	UG/M3	**10.8**	**16**	**13.9**	**11.9**	**14.8**	**8.8**	**7.79**	**3.66**	**6.44**	**3.39**	**1.72**	1.23 U	**61**	**32**	**9.93**	**47.2**	**75.5**	**47.9**
m,p-Xylene	UG/M3	**8.17**	**25.7**	**12.2**	**13.5**	**6.82**	**9.38**	**8.51**	**29.6**	**7.3**	**3.75**	**4.11**	**4.25**	**18.2**	**8.43**	**13.1**	**11**	**15.6**	**16.8**
Methyl Ethyl Ketone (2-Butanone)	UG/M3	**6.93**	**12.4**	**14.5**	**5.69**	**8.7**	**15.4**	**7.46**	1.47 U	1.47 U	**13.2**	**5.9**	1.47 U	**15.4**	**16**	**15.9**	**22.7**	**25.1**	**37.8**
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone	UG/M3	2.05 U	**3.52**	**4.34**	2.05 U	6.84 U	4.1 U	2.05 U	2.05 U	2.05 U	2.56 U	2.05 U	2.05 U	**2.77**	**2.91**	12.8 U	9.3 U	**4.59**	**5.45**
N-Heptane	UG/M3	0.82 U	**2.31**	**2.6**	**1.18**	2.73 U	1.64 U	**1.11**	0.82 U	0.82 U	**12.4**	**10.2**	**6.23**	**1.67**	**1.1**	**6.64**	**4.1**	**6.64**	**8.77**
N-Hexane	UG/M3	0.705 U	**4.44**	**3.91**	0.705 U	2.35 U	**1.47**	**1.16**	0.705 U	0.705 U	**4.58**	**1.28**	0.705 U	**0.825**	**0.758**	**6.1**	**5.85**	**8.92**	**10.5**
O-Xylene (1,2-Dimethylbenzene)	UG/M3	**2.72**	**8.51**	**4.16**	**4.34**	2.9 U	**2.71**	**2.78**	**9.9**	**2.39**	**1.35**	**1.5**	**1.55**	**5.86**	**2.79**	5.43 U	3.95 U	**5**	**5.91**

Table 15. Summary of Volatile Organic Compounds in Indoor, Ambient Air and Soil Vapor, 11-20 46th Road Site, Long Island City, New York (NYSDEC BCP Site No. C241242)

Sample Designation:		SS-8	SS-9	SS-9	SS-10	SS-10	SS-11	SS-11	SS-12	SS-12	SV-13	SV-14	SV-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21
Sample Date:		03/18/2020	12/03/2019	03/18/2020	03/17/2020	12/03/2019	12/03/2019	03/17/2020	12/03/2019	03/17/2020	01/16/2020	01/16/2020	01/16/2020	03/17/2020	03/17/2020	03/17/2020	03/18/2020	03/18/2020	03/18/2020
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Unit																		
Styrene	UG/M3	**2.78**	**9.32**	**2.83**	**3.44**	2.84 U	1.7 U	**1.49**	**11.5**	**1.61**	1.06 U	0.852 U	0.852 U	**4.51**	**1.31**	5.32 U	3.87 U	**5.15**	**4.94**
Tert-Butyl Alcohol	UG/M3	**11.9**	**12**	**13.6**	**10.6**	**10.2**	**3.82**	**5.03**	**4.73**	**3.46**	**4.82**	**5.88**	1.52 U	**24.4**	**4.61**	**11.5**	**13.3**	**19.4**	**12.7**
Tert-Butyl Methyl Ether	UG/M3	0.721 U	1.2 U	0.721 U	0.721 U	2.4 U	1.44 U	0.721 U	0.721 U	0.721 U	0.901 U	0.721 U	0.721 U	0.721 U	0.721 U	4.51 U	3.28 U	0.721 U	0.721 U
Tetrahydrofuran	UG/M3	1.47 U	2.46 U	1.47 U	1.47 U	4.93 U	2.95 U	**3.83**	1.47 U	1.47 U	1.84 U	1.47 U	1.47 U	1.47 U	1.47 U	9.2 U	6.69 U	1.47 U	1.47 U
Toluene	UG/M3	**6.14**	**5.58**	**12.1**	**10.9**	2.51 U	**2.24**	**8.22**	**3.47**	**6.33**	**196**	**234**	**203**	**17.2**	**6.37**	**38.8**	**17.8**	**24.1**	**18.2**
Trans-1,2-Dichloroethene	UG/M3	0.793 U	1.32 U	**0.88**	0.793 U	2.64 U	1.59 U	0.793 U	0.793 U	0.793 U	0.991 U	0.793 U	0.793 U	0.793 U	0.793 U	**9.67**	3.6 U	**6.11**	0.793 U
Trans-1,3-Dichloropropene	UG/M3	0.908 U	1.51 U	0.908 U	0.908 U	3.03 U	1.82 U	0.908 U	0.908 U	0.908 U	1.13 U	0.908 U	0.908 U	0.908 U	0.908 U	5.67 U	4.13 U	0.908 U	0.908 U
Trichlorofluoromethane	UG/M3	**1.4**	**3.5**	**3.43**	**1.97**	3.75 U	**4.3**	**2.84**	**1.5**	**1.47**	1.4 U	**1.27**	**1.14**	**1.86**	**1.53**	7.02 U	5.11 U	**3.01**	**9.89**
Vinyl Bromide	UG/M3	0.874 U	1.46 U	0.874 U	0.874 U	2.92 U	1.75 U	0.874 U	0.874 U	0.874 U	1.09 U	0.874 U	0.874 U	0.874 U	0.874 U	5.47 U	3.97 U	0.874 U	0.874 U

FIGURES

1. Site Location Map
2. Site Layout Map
3. A. Groundwater Elevations and Contour Map – December 11, 2019
   B. Groundwater Elevations and Contour Map – May 5, 2020
4. Soil Sample Exceedances of Unrestricted and/or Restricted Residential Use Soil Clean-up Objectives
5. Groundwater Exceedances
6. Detections of VOCs in Sub-Slab Vapor, Cellar Indoor Air, and Ambient Air Pre- and Post-SSDS Start-Up
7. Detections of VOCs in First Floor Indoor Air Pre- and Post-SSDS Start-Up
8. Detections of VOCs in Second Floor Indoor Air Pre- and Post-SSDS Start-Up
9. Detections of VOCs in Third Floor Indoor Air Pre- and Post-SSDS Start-Up
10. Composite Cover System Layout



QUADRANGLE LOCATION

SOURCE:
USGS; 2013, Central Park, NY-NJ
7.5 Minute Topographic Quadrangle

N

0 2000'

Title:

SITE LOCATION MAP

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: G.M.	Scale AS SHOWN	1
Project Mgr: R.L.	Project: 3371.0001Y000	
File: 3371.0001Y141.01.CDR		

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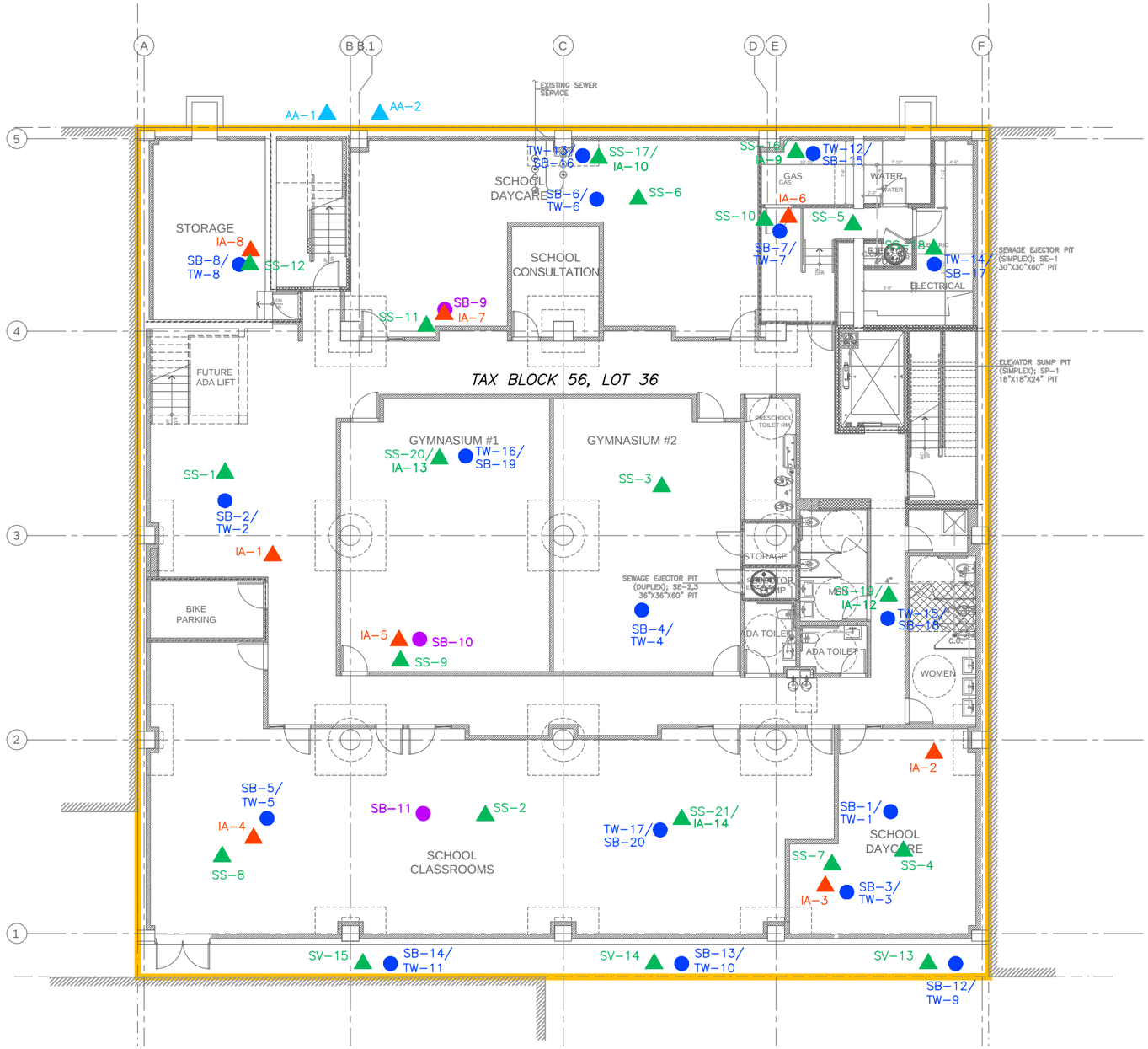

LEGEND

- BCP SITE BOUNDARY
- SB–10 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION
- SB–3/ TW–3 — APPROXIMATE SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION
- IA–3 — APPROXIMATE INDOOR AIR LOCATION AND DESIGNATION
- SS–7 — APPROXIMATE SUB–SLAB VAPOR LOCATION AND DESIGNATION
- AA–2 — APPROXIMATE AMBIENT AIR SAMPLE LOCATION AND DESIGNATION

N

15’ 0 15’

Title:

SITE LAYOUT MAP

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	2
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y141.02.DWG		

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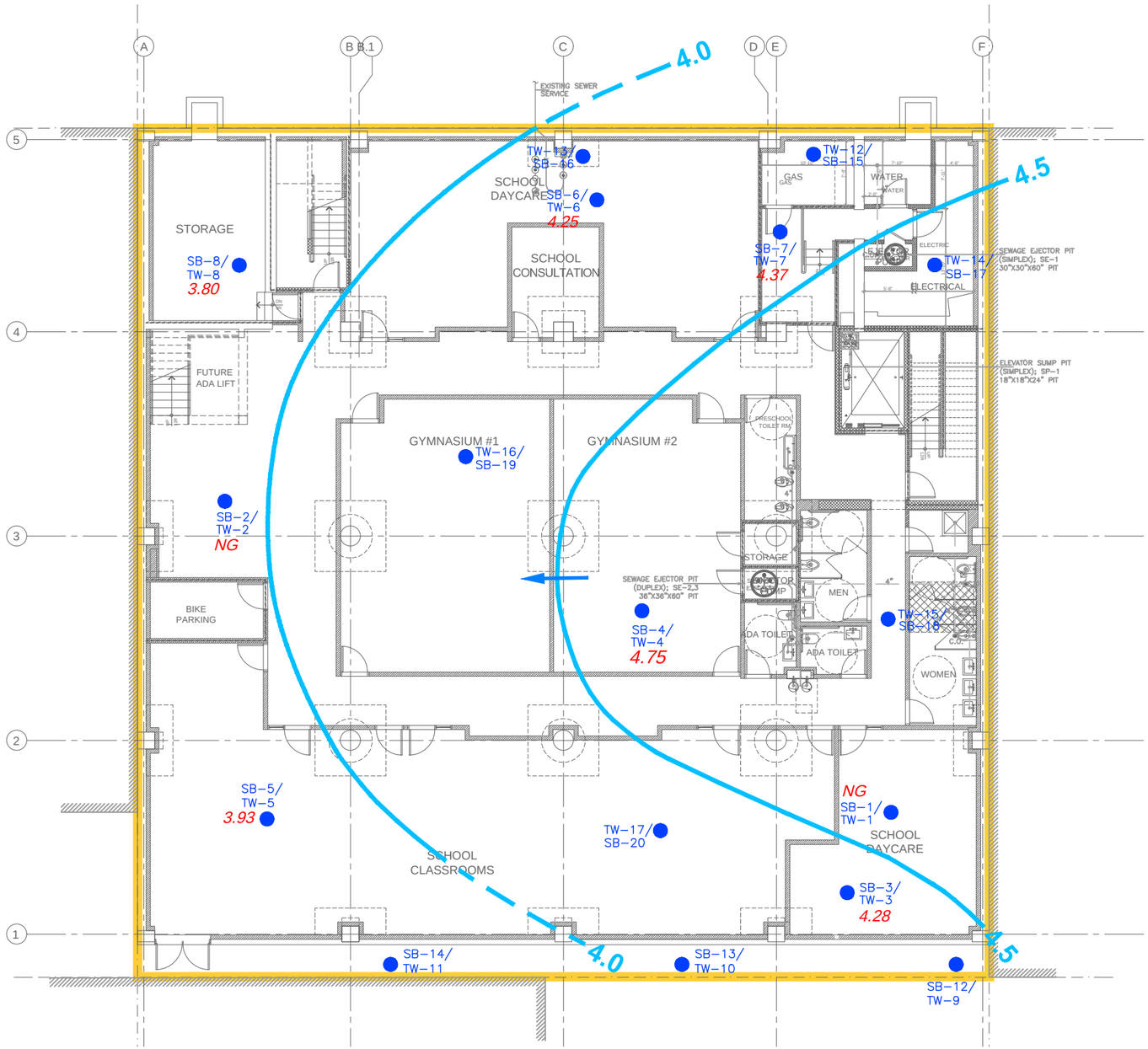

LEGEND

- SITE BOUNDARY
- SB-3/ TW-3 — APPROXIMATE TEMPORARY WELL LOCATION AND DESIGNATION
- 4.28 — GROUNDWATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL
- NG — NOT GAUGED
- 4.0 — LINE OF EQUAL GROUNDWATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION

N

15' 0 15'

Title:

GROUNDWATER ELEVATIONS AND CONTOUR MAP, DECEMBER 11, 2019

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: B.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	3A
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y141.03.DWG		

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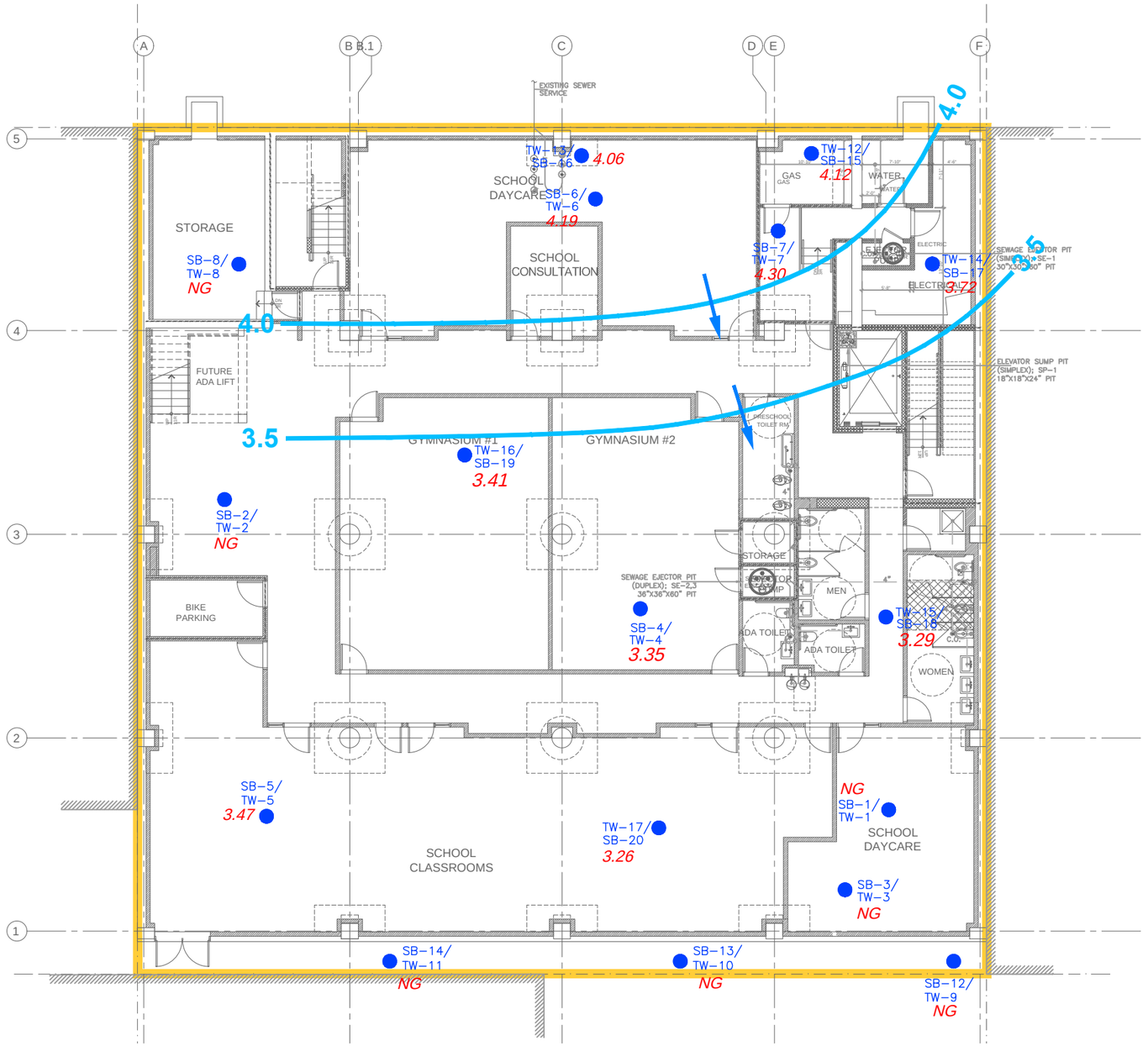

LEGEND

- SITE BOUNDARY
- SB-3/ TW-3 — APPROXIMATE TEMPORARY WELL LOCATION AND DESIGNATION
- 4.12 — GROUNDWATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL
- NG — NOT GAUGED
- 4.0 — LINE OF EQUAL GROUNDWATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION

15' 0 15'

Title:

GROUNDWATER ELEVATIONS AND AND CONTOUR MAP, MAY 5, 2020

11-20 46TH ROAD SITE
BCP SITE NO, C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: B.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	3B
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y141.03.DWG		

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SB-16	3/16/2020	
Depth (ft bls)	0 - 2	3-5
VOCs	NE	NE
SVOCs		
Benzo[a]anthracene	2.6	NE
Benzo[a]pyrene	2.4	NE
Benzo[b]fluoranthene	3.1	NE
Benzo[k]fluoranthene	1.1	NE
Chrysene	2.4	NE
Dibenz[a,h]anthracene	0.35	ND
Indeno[1,2,3-c,d]pyrene	1.5	NE
METALS		
Chromium, Trivalent	35	NE
Chromium, Hexavalent	1.55	ND
Chromium	36.9	NE
Copper	82.8	NE
Lead	216	NE
Zinc	495	NE
PCBs	ND	ND
PESTICIDES		
4,4'-DDE	0.00414	ND

SB-15	3/16/2020	
Depth (ft bls)	0 - 2	5-7
VOCs	NE	NE
SVOCs	NE	NE
METALS		
Chromium, Trivalent	54	NE
Chromium	53.9	NE
Copper	880	NE
Lead	861	NE
Nickel	110	NE
Zinc	6080	NE
PCBs	ND	ND
PESTICIDES		
4,4'-DDE	0.0104	ND

SB-6	12/9/19		
Depth (ft bls)	1 - 3	1 - 3 DUP	5 - 7
VOCs	NE	NE	NE

SB-7	12/9/19
Depth (ft bls)	5 - 7
VOCs	NE

SB-9	12/9/19	
Depth (ft bls)	2 - 4	5 - 7
VOCs		
Acetone	9.4	0.068

SB-8	12/10/19	
Depth (ft bls)	0 - 2	4 - 6
VOCs		
Acetone	3.1	1.8

SB-17	3/16/2020	
Depth (ft bls)	0 - 2	4-6
VOCs	NE	NE
SVOCs	NE	NE
METALS		
Chromium, Trivalent	40	NE
Chromium	39.6	NE
Copper	468	NE
Lead	461	NE
Nickel	59.1	NE
Zinc	3360	NE
PCBs	ND	ND
PESTICIDES		
4,4'-DDE	0.00708	ND

SB-19	3/17/2020	
Depth (ft bls)	0 - 2	4-6
VOCs		
Acetone	ND	0.092
SVOCs		
Benzo[a]anthracene	1.9	NE
Benzo[a]pyrene	1.8	NE
Benzo[b]fluoranthene	2.2	NE
Chrysene	1.7	NE
Indeno[1,2,3-c,d]pyrene	1 J	NE
METALS		
Arsenic	NE	25.7
Chromium, Trivalent	33 J	NE
Chromium	33.9	NE
Copper	104	NE
Lead	213	NE
Mercury	0.213	ND
Zinc	544	176
PCBs	ND	ND
PESTICIDES		
4,4'-DDE	0.0124	ND

SB-18	3/17/2020	
Depth (ft bls)	0 - 2	4-6
VOCs		
Acetone		7.3
SVOCs		
Benzo[a]anthracene	1.2	10
Benzo[a]pyrene	1.2 J	18
Benzo[b]fluoranthene	1.2	17
Benzo[k]fluoranthene	NE	5.1
Chrysene	1.1	9.5
Dibenz[a,h]anthracene	ND	2.9
Indeno[1,2,3-c,d]pyrene	0.73 J	12
METALS		
Cadmium	NE	2.78
Copper	NE	86.2
Lead	NE	596
Mercury	NE	0.252
Zinc	154	2170
PCBs	ND	ND
PESTICIDES		
4,4'-DDE	0.00642	ND

SB-2	10/21/19
Depth (ft bls)	1 - 3
VOCs	NE

SB-10	12/11/19	
Depth (ft bls)	3 - 5	5 - 7
VOCs		
Acetone	1.8	NE

SB-5	12/10/19
Depth (ft bls)	5 - 7
VOCs	
Acetone	1.1

SB-4	12/10/19	
Depth (ft bls)	3 - 5	5 - 7
VOCs		
Acetone	3.2	4
Naphthalene	33	NE
Xylenes (total)	0.32 J	NE

SB-11	12/11/19	
Depth (ft bls)	3 - 5	5 - 7
VOCs		
Acetone	NE	0.97

SB-1	10/21/19	
Depth (ft bls)	0 - 2	0 - 2 DUP
VOCs	NE	NE

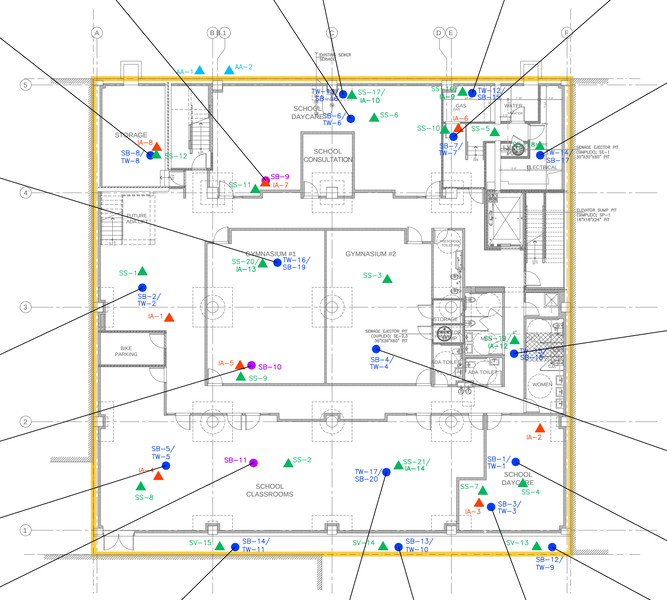
SB-14	1/13/2020	
Depth (ft bls)	0 - 2	7-9
VOCs	NE	NE

SB-20	3/17/2020		
Depth (ft bls)	0 - 2	0 - 2 DUP	4-6
VOCs	NE	NE	NE
SVOCs			
Benzo[a]anthracene	1.1	NE	3.5
Benzo[a]pyrene	1.2 J	NE	4.1
Benzo[b]fluoranthene	1.5	1.3	4.4
Benzo[k]fluoranthene	NE	NE	1.2
Chrysene	1.2	NE	3.6
Dibenz[a,h]anthracene	ND	ND	0.66
Indeno[1,2,3-c,d]pyrene	0.74 J	0.65 J	2.6
METALS			
Arsenic	NE	NE	21.3
Cadmium	NE	NE	10.9
Chromium, Trivalent	NE	NE	34 J
Chromium, Hexavalent	1.51	1.29	NE
Chromium	NE	NE	35.3
Copper	NE	NE	153
Lead	NE	NE	2780
Mercury	0.408	NE	0.531
Zinc	NE	213	9440
PCBs	ND	NE	ND
PESTICIDES			
Aldrin	0.0123	0.0128	ND
cis-Chlordane	0.108	0.106	ND
Dieldrin	0.0209	0.0221	ND
4,4'-DDE	0.0159	0.0168	ND

SB-3	12/11/19	
Depth (ft bls)	1 - 3	5 - 7
VOCs	NE	NE

SB-12	1/13/2020	
Depth (ft bls)	0 - 2	11 - 13
VOCs	NE	NE

SB-13	1/13/2020	
Depth (ft bls)	0 - 2	6-8
VOCs	NE	NE



LEGEND

- SITE BOUNDARY
- SB-10 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION
- SB-3/TW-3 — APPROXIMATE SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION
- IA-3 — APPROXIMATE INDOOR AIR LOCATION AND DESIGNATION
- SS-7 — APPROXIMATE SUB-SLAB VAPOR LOCATION AND DESIGNATION
- AA-2 — APPROXIMATE AMBIENT AIR SAMPLE LOCATION AND DESIGNATION

TYPICAL DATA BOX INFORMATION

SAMPLE ID#	SB-8	12/10/19		SAMPLE DATE
	Depth (ft bls)	0 - 2	4 - 6	SAMPLE DEPTH (FT)
ANALYTES	VOCs			CONCENTRATION (mg/kg)
	Acetone	3.1	1.8	

Parameter	Standards* (mg/kg)	Standards** (mg/kg)
VOCs		
Acetone	0.05	100
N-Propylbenzene	3.9	100
Naphtalene	12	100
Xylenes (total)	0.26	100
SVOCs		
Benzo[a]anthracene	1	1
Benzo[a]pyrene	1	1
Benzo[b]fluoranthene	1	1
Benzo[k]fluoranthene	0.8	3.9
Chrysene	1	3.9
Dibenz[a,h]anthracene	0.33	0.33
Indeno[1,2,3-c,d]pyrene	0.5	0.5
METALS		
Arsenic	13	16
Cadmium	2.5	4.3
Chromium, Hexavalent	1	110
Chromium, Trivalent	30	180
Chromium	30	180
Copper	50	270
Lead	63	400
Mercury	0.2	0.81
Nickel	30	310
Zinc	109	10,000
PCBs, Total	0.1	1
PESTICIDES		
4,4'-DDT	0.0033	7.9
4,4'-DDE	0.0033	8.9
Aldrin	0.005	0.097
cis-Chlordane	0.094	4.2
Dieldrin	0.005	0.2

Concentrations in mg/kg

mg/kg - Milligrams per kilogram
* - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives
** - NYSDEC Part 375 Restricted Residential Soil Cleanup Objectives
NYSDEC - New York State Department of Environmental Conservation
J - Estimated value
DUP - Duplicate Sample
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCBs - Polychlorinated Biphenyls
SCOs - Soil Cleanup Objectives
NE - No exceedance
ND - No detection
ft bls - Feet below land surface

Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use SCO

Shaded data indicates that parameter was detected above the NYSDEC Part 375 Commercial SCO

Note: All soil samples collected prior to March 2020 were only analyzed for VOC.

N

15' 0 15'

Title:

SOIL SAMPLE EXCEEDANCES OF UNRESTRICTED AND/OR RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	4
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y141.04.DWG		

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TW-8	12/10/19	3/16/20
VOCs		
Naphthalene	**290**	**130**
SVOCs		
Acenaphthene	NA	**24**
Benzo[a]anthracene	NA	**0.19**
Benzo[a]pyrene	NA	**0.07 J**
Benzo[b]fluoranthene	NA	**0.12**
Benzo[k]fluoranthene	NA	**0.04 J**
Chrysene	NA	**0.16**
Indeno[1,2,3-c,d]pyrene	NA	**0.05 J**
Phenol	NA	**1.1 J**
Metals (Total)		
Iron	NA	**40300**
Lead	NA	**122**
Magnesium	NA	**44900**
Manganese	NA	**1429**
Sodium	NA	**300000**
Metals (Dissolved)		
Iron	NA	**7680**
Lead	NA	ND
Magnesium	NA	**40000**
Manganese	NA	**1043**
Sodium	NA	**306000**
PCBs	NA	NA
Pesticides	NA	NE
Pesticides		
trans-Chlordane	NA	**0.006 J**

TW-16	3/18/2020
VOCs	NE
SVOCs	
Benzo[a]anthracene	**1.4**
Benzo[a]pyrene	**1.6**
Benzo[b]fluoranthene	**1.6**
Benzo[k]fluoranthene	**0.56**
Chrysene	**1.5**
Indeno[1,2,3-c,d]pyrene	**1.2**
Metals (Total)	
Antimony	**3.09 J**
Arsenic	**228.5**
Copper	**269.2**
Iron	**28400**
Lead	**466.9**
Manganese	**4490**
Mercury	**0.92**
Selenium	**24.2**
Thallium	**0.66 J**
Metals (Dissolved)	
Antimony	NE
Arsenic	NE
Copper	ND
Iron	**982**
Lead	ND
Manganese	**3642**
Mercury	ND
Selenium	ND
Thallium	NE
PCBs	ND
Pesticides	ND

TW-6	12/10/19	12/10/2019 DUP	3/16/20
VOCs			
1,2-Dichloroethene (total)	**12**	**14**	**12**
cis-1,2-Dichloroethene	**12**	**14**	**12**
SVOCs	NA	NA	NE
Metals (Total)			
Iron	NA	NA	**14400**
Manganese	NA	NA	**3419**
Sodium	NA	NA	**170000**
Metals (Dissolved)			
Iron	NA	NA	ND
Manganese	NA	NA	**2367**
Sodium	NA	NA	**167000**
PCBs	NA	NA	NA
Pesticides	NA	NA	ND

TW-13	3/18/2020	3/18/2020 DUP
VOCs		
Benzene	**8**	**8**
SVOCs		
Acenaphthene	**53**	**35**
Benzo[a]anthracene	**0.88**	**2.2**
Benzo[a]pyrene	**0.5**	**1.2**
Benzo[b]fluoranthene	**0.7**	**1.8**
Benzo[k]fluoranthene	**0.22**	**0.59**
Chrysene	**0.72**	**1.9**
Indeno[1,2,3-c,d]pyrene	**0.3**	**0.79**
Phenol	NE	**1.4 J**
Metals (Total)		
Antimony	NE	NE
Iron	**6910**	**7250**
Lead	**67.77**	**74.06**
Manganese	**1522**	**1567**
Sodium	**146000**	**148000**
Metals (Dissolved)		
Antimony	NE	**4.2**
Iron	NE	NE
Lead	ND	ND
Manganese	**1441**	NE
Sodium	**128000**	**125000**
PCBs	ND	ND
Pesticides	NE	NE
trans-Chlordane	**0.14 J**	**0.029 J**

TW-7	12/10/19	3/16/20
VOCs		
Vinyl chloride	**2.5**	**2.4**
SVOCs		
Acenaphthene	NA	**30**
Metals (Total)		
Iron	NA	**3900**
Manganese	NA	**992.2**
Sodium	NA	**209000**
Metals (Dissolved)		
Iron	NA	NE
Manganese	NA	**913**
Sodium	NA	**203000**
PCBs	NA	NA
Pesticides	NA	ND

TW-12	3/18/2020
VOCs	NE
SVOCs	
Benzo[a]anthracene	**0.08 J**
Benzo[a]pyrene	**0.02 J**
Benzo[b]fluoranthene	**0.03 J**
Benzo[k]fluoranthene	**0.01 J**
Chrysene	**0.04 J**
Metals (Total)	
Arsenic	**29.63**
Barium	**4223**
Beryllium	**19.05**
Chromium	**313.9**
Copper	**988.4**
Iron	**214000**
Lead	**1243**
Magnesium	**35700**
Manganese	**12750**
Mercury	**1.5**
Nickel	**292.8**
Selenium	**65.4**
Sodium	**246000**
Thallium	**1.6**
Metals (Dissolved)	
Antimony	NE
Arsenic	NE
Barium	ND
Beryllium	ND
Chromium	ND
Copper	NE
Iron	NE
Lead	NE
Magnesium	NE
Manganese	NE
Mercury	ND
Nickel	NE
Selenium	ND
Sodium	**204000**
Thallium	ND
PCBs	ND
Pesticides	NE

TW-14	3/18/2020
VOCs	
1,2,4,5-Tetramethylbenzene	**9.6**
SVOCs	
Acenaphthene	**31**
Benzo[a]anthracene	**0.06 J**
Benzo[a]pyrene	**0.02 J**
Benzo[b]fluoranthene	**0.03 J**
Benzo[k]fluoranthene	**0.01 J**
Chrysene	**0.04 J**
Indeno[1,2,3-c,d]pyrene	**0.03 J**
Phenol	**24**
Metals (Total)	
Arsenic	**26.25**
Barium	**2742**
Beryllium	**13.55**
Chromium	**412.8**
Copper	**666.1**
Iron	**246000**
Lead	**754.5**
Magnesium	**47000**
Manganese	**6615**
Mercury	**0.84**
Nickel	**244.9**
Selenium	**43.1**
Sodium	**260000**
Thallium	**1.76**
Metals (Dissolved)	
Arsenic	NE
Barium	NE
Beryllium	ND
Chromium	ND
Copper	ND
Iron	ND
Lead	ND
Magnesium	NE
Manganese	NE
Mercury	ND
Nickel	NE
Selenium	ND
Sodium	**232000**
Thallium	ND
PCBs	ND
Pesticides	NE

TW-15	3/18/2020
VOCs	
1,2,4,5-Tetramethylbenzene	**14**
Isopropylbenzene (Cumene)	**5.2**
N-Propylbenzene	**8**
SVOCs	
Benzo[a]anthracene	**3.8**
Benzo[a]pyrene	**4.6**
Benzo[b]fluoranthene	**5.1**
Benzo[k]fluoranthene	**1.4**
Chrysene	**3.6**
Indeno[1,2,3-c,d]pyrene	**3.7**
Metals (Total)	
Antimony	NE
Arsenic	**38.91**
Cyanide	**2310**
Iron	**6390**
Lead	**54.97**
Manganese	**414.5**
Metals (Dissolved)	
Antimony	**5.34**
Arsenic	**28.99**
Cyanide	NA
Iron	NE
Lead	NE
Manganese	NE
PCBs	ND
Pesticides	ND

TW-2	10/21/19
VOCs	ND

TW-5	12/11/19	3/16/20
VOCs	ND	ND
SVOCs		
Benzo[a]anthracene	NA	**6**
Benzo[a]pyrene	NA	**11**
Benzo[b]fluoranthene	NA	**8**
Benzo[k]fluoranthene	NA	**2**
Chrysene	NA	**6.8**
Indeno[1,2,3-c,d]pyrene	NA	**15**
Metals (Total)		
Iron	NA	**6380**
Lead	NA	**124.2**
Sodium	NA	**23500**
Metals (Dissolved)		
Iron	NA	**307**
Lead	NA	ND
Sodium	NA	**22200**
PCBs	NA	ND
Pesticides		
trans-Chlordane	NA	**0.008 J**

TW-11	1/13/2020
VOCs	ND

TW-4	12/11/19	3/16/20
VOCs	NE	NE
SVOCs		
Benzo[a]anthracene	NA	**0.92**
Benzo[a]pyrene	NA	**0.88**
Benzo[b]fluoranthene	NA	**0.99**
Benzo[k]fluoranthene	NA	**0.33**
Chrysene	NA	**0.86**
Indeno[1,2,3-c,d]pyrene	NA	**0.64**
Metals (Total)		
Iron	NA	**19000**
Lead	NA	**286.6**
Manganese	NA	**1215**
Mercury	NA	**1.31**
Sodium	NA	**248000**
Metals (Dissolved)		
Iron	NA	**2100**
Lead	NA	ND
Manganese	NA	**998.1**
Mercury	NA	ND
Sodium	NA	**258000**
PCBs	NA	ND
Pesticides		
trans-Chlordane	NA	**0.013 J**

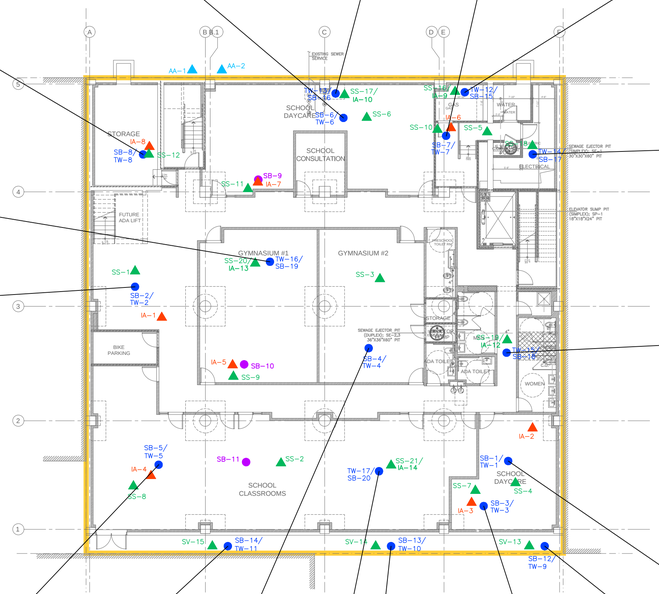
TW-17	3/18/2020
VOCs	ND
SVOCs	
Benzo[a]anthracene	**0.08 J**
Benzo[a]pyrene	**0.07 J**
Benzo[b]fluoranthene	**0.08 J**
Benzo[k]fluoranthene	**0.03 J**
Chrysene	**0.06 J**
Indeno[1,2,3-c,d]pyrene	**0.05 J**
Metals (Total)	
Antimony	NE
Iron	**13000**
Lead	**33.39**
Manganese	**333.8**
Metals (Dissolved)	
Antimony	**7.99**
Iron	NE
Lead	NE
Manganese	NE
PCBs	ND
Pesticides	ND

TW-9	1/13/2020
VOCs	ND

TW-3	12/11/19
VOCs	ND

TW-9	1/13/2020
VOCs	ND

TW-1	10/21/19	10/21/2019 DUP
VOCs	NE	NE



LEGEND

- SITE BOUNDARY
- SB-10 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION
- SB-3/TW-3 — APPROXIMATE SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION
- IA-3 — APPROXIMATE INDOOR AIR LOCATION AND DESIGNATION
- SS-7 — APPROXIMATE SUB-SLAB VAPOR LOCATION AND DESIGNATION
- AA-2 — APPROXIMATE AMBIENT AIR SAMPLE LOCATION AND DESIGNATION

TYPICAL DATA BOX INFORMATION

SAMPLE ID# — SAMPLE DATE — ANALYTES — CONCENTRATION (µg/L)

TW-6	12/10/19	12/10/2019 DUP	3/16/20
VOCs			
1,2-Dichloroethene (total)	**12**	**14**	**12**
cis-1,2-Dichloroethene	**12**	**14**	**12**
SVOCs	NA	NA	NE
Metals (Total)			
Iron	NA	NA	**14400**
Manganese	NA	NA	**3419**
Sodium	NA	NA	**170000**
Metals (Dissolved)			
Iron	NA	NA	ND
Manganese	NA	NA	**2367**
Sodium	NA	NA	**167000**
PCBs	NA	NA	NA
Pesticides	NA	NA	ND

Parameter	Standards* (g L)
VOCs	
1,2,4,5-Tetramethylbenzene	5
Benzene	1
1,2-Dichloroethene (total)	5
cis-1,2-Dichloroethene	5
Isopropylbenzene	5
Naphthalene	10
n-Propylbenzene	5
Vinyl chloride	2
SVOCs	
Acenaphthene	20
Benzo[a]anthracene	0.002
Benzo[a]pyrene	0
Benzo[b]fluoranthene	0.002
Benzo[k]fluoranthene	0.002
Chrysene	0.002
Indeno[1,2,3-c,d]pyrene	0.002
Phenol	1
Metals	
Antimony	3
Arsenic	25
Barium	1000
Beryllium	3
Copper	200
Chromium	50
Cyanide	200
Iron	300
Lead	25
Magnesium	35000
Manganese	300
Mercury	0.7
Nickel	100
Selenium	10
Sodium	20000
Thallium	0.5
PCBs	NE
Pesticides	NE

Con entration in g L
g L - Mi rogram er liter
* - NYSDEC AWQSGVs
NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
J - Estimated Value
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCBs - Polychlorinated biphenyls
NA - Compound not analyzed for
NE - No Exceedance
ND - No Detection

Bold data indicates that parameter was detected above the NYSDEC AWQSGVs
All samples collected prior to March 2020 were only analyzed for VOCs.

N

15' 0 15'

Title:

GROUNDWATER EXCEEDANCES

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	5
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y141.05.DWG		

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IA-7	12/03/2019	03/17/2020	03/17/2020 DUP	09/08/2020	09/08/2020 DUP	11/19/2020	03/04/2021	04/12/2021
VOCs								
Carbon Tetrachloride	**0.459**	**0.428**	**0.377**	**0.459 J**	**0.352**	**0.459**	**0.56**	**0.409**
1,1,1-Trichloroethane (TCA)	ND	ND	ND	**0.147 J**	ND	ND	ND	ND
Cis-1,2-Dichloroethylene	**0.944**	**1.19**	**0.789**	**1.13 J**	**1.81**	**0.71**	ND	ND
Trichloroethylene (TCE)	ND	ND	ND	ND	ND	ND	ND	**0.21**
Tetrachloroethylene (PCE)	**1.7**	**1.12**	**0.698**	**0.515 J**	**0.705**	**0.319**	ND	**0.441**
Methylene Chloride	ND	ND	ND	**2.49 J**	ND	**27.7**	**2.61**	**13**
Vinyl Chloride	**0.082**	**0.064**	ND	ND	**0.087**	ND	ND	ND

AA-2	12/03/2019	03/17/2020
VOCs		
Carbon Tetrachloride	**0.503**	**0.409**
Tetrachloroethylene (PCE)	**0.285**	**0.502**

AA-1	08/23/2019	09/26/2019	12/06/2020	03/04/2021	04/12/2021
VOCs					
Carbon Tetrachloride	**0.419**	**0.478**	**0.371**	**0.44**	**0.396**
Cis-1,2-Dichloroethylene	ND	**0.202**	ND	ND	ND
Tetrachloroethylene (PCE)	**1.12**	**0.956**	ND	ND	**0.407**
Methylene Chloride	ND	**2.23**	ND	ND	ND

IA-10	03/17/2020	09/08/2020	11/19/2020	11/19/2020 FD	03/04/2021	04/12/2021
VOCs						
Carbon Tetrachloride	**0.39**	**0.472**	**0.465**	**0.497**	**0.51**	**0.384**
Cis-1,2-Dichloroethylene	**1.26**	**1.57**	**1.79**	**1.8**	ND	ND
Trichloroethylene (TCE)	ND	ND	ND	ND	ND	**0.172**
Tetrachloroethylene (PCE)	**1.1**	**0.712**	**0.59**	**0.556**	ND	**0.475**
Methylene Chloride	ND	ND	**26.3**	**27.7**	ND	**10.8**
Vinyl Chloride	**0.051**	**0.079**	**0.067**	**0.061**	ND	ND

IA-8	12/03/2019	03/17/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021
VOCs						
Carbon Tetrachloride	**0.459**	**0.384**	**0.472**	**0.484**	**0.528**	**0.434**
Cis-1,2-Dichloroethylene	**0.646**	**0.48**	**1.41**	**0.416**	ND	ND
Tetrachloroethylene (PCE)	**1.35**	**0.726**	**0.719**	**0.312**	ND	**0.475**
Methylene Chloride	ND	**2.08**	ND	**8.44**	**3.24**	**3.58**
Vinyl Chloride	**0.072**	ND	**0.079**	ND	ND	ND

IA-9	03/17/2020	09/08/2020	11/19/2020	02/04/2021	03/04/2021	04/12/2021
VOCs						
Carbon Tetrachloride	**0.409**	**0.535**	**0.472**	**0.415**	**0.547**	**0.415**
Cis-1,2-Dichloroethylene	**1.82**	**2.21**	**0.829**	**1.67**	ND	**0.856**
Trichloroethylene (TCE)	ND	ND	ND	ND	ND	**0.124**
Tetrachloroethylene (PCE)	**1.24**	**0.807**	**0.346**	**0.353**	ND	**0.549**
Methylene Chloride	ND	ND	**23.3**	**6.18**	**3.35**	**4.34**
Vinyl Chloride	**0.084**	**0.11**	ND	**0.074**	ND	**0.079**

IA-13	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021	04/12/2021 DUP
VOCs						
Carbon Tetrachloride	**0.396**	**0.478**	**0.465**	**0.465**	**0.409**	**0.415**
Cis-1,2-Dichloroethylene	**0.932**	**1.63**	**0.496**	ND	ND	ND
Trichloroethylene (TCE)	ND	ND	ND	ND	ND	**0.124**
Tetrachloroethylene (PCE)	**0.698**	**0.719**	**0.325**	ND	**0.454**	**0.441**
Methylene Chloride	ND	ND	**23**	**3.68**	**7.3**	**7.09**
Vinyl Chloride	**0.054**	**0.077**	ND	ND	ND	ND

IA-6	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021
VOCs									
Carbon Tetrachloride	**0.453**	**0.365**	**0.428**	**0.447**	**0.478**	**0.384**	**0.403**	**0.554**	**0.396**
Cis-1,2-Dichloroethylene	**1.52**	**1**	**1.72**	**2.34**	**1.95**	**1.94**	**2**	**0.091**	**1.65**
Trichloroethylene (TCE)	**0.172**	**0.355**	ND	ND	ND	**0.623**	ND	ND	**0.129**
Tetrachloroethylene (PCE)	**2.23**	**0.705**	**1.31**	**0.854**	**0.637**	**1.34**	**0.373**	ND	**0.563**
Methylene Chloride	ND	ND	ND	ND	**28.3**	**68.1**	**6.74**	**3.51**	**4.06**
Vinyl Chloride	**0.141**	**0.059**	**0.072**	**0.112**	**0.082**	**0.061**	**0.102**	ND	**0.148**

IA-1	08/23/2019	09/26/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021
VOCs										
Carbon Tetrachloride	**0.396**	**0.484**	**0.503**	**0.384**	**0.497**	**0.421**	**0.39**	**0.465**	**0.428**	**0.428**
Cis-1,2-Dichloroethylene	ND	**1.19**	**0.801**	**4.12**	**1.17**	**0.464**	**1.51**	ND	ND	ND
Trichloroethylene (TCE)	ND	**0.199**	ND	**0.129**	ND	ND	**0.758**	**0.231**	ND	**0.242**
Tetrachloroethylene (PCE)	**1.01**	**2.27**	**0.495**	**2.31**	**0.644**	**0.332**	**1.29**	ND	ND	**0.461**
Methylene Chloride	**3.41**	ND	ND	ND	ND	**28.9**	**74**	**16.7**	**4.48**	**8.41**
Vinyl Chloride	ND	**0.169**	ND	**0.181**	**0.064**	ND	**0.059**	ND	ND	ND

IA-12	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021
VOCs					
Carbon Tetrachloride	**0.384**	**0.434**	**0.465**	**0.56**	**0.403**
Cis-1,2-Dichloroethylene	**1.41**	**1.54**	**0.373**	ND	**0.087**
Trichloroethylene (TCE)	ND	ND	**0.215**	ND	**0.193**
Tetrachloroethylene (PCE)	**1.15**	**0.719**	**0.264**	ND	**0.387**
Methylene Chloride	ND	ND	**66.7**	**2.91**	**6.46**
Vinyl Chloride	**0.077**	**0.069**	ND	ND	ND

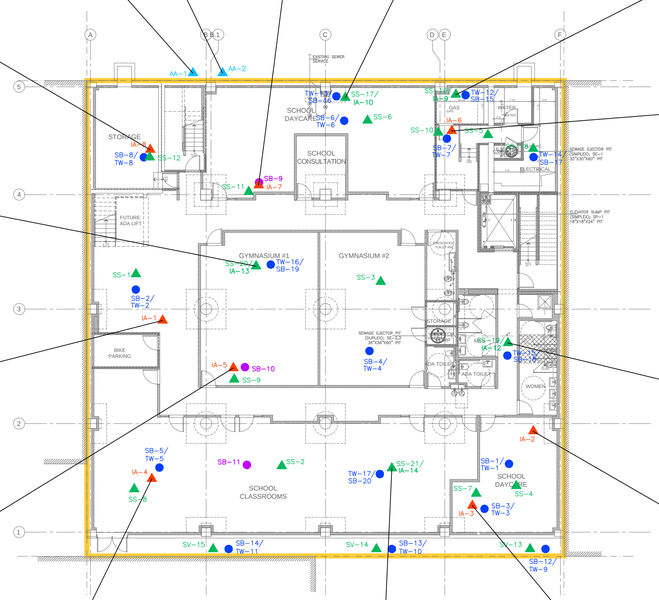
IA-5	12/03/2019	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021
VOCs						
Carbon Tetrachloride	**0.497**	**0.415**	**0.478**	**0.472**	**0.516**	**0.428**
Cis-1,2-Dichloroethylene	**0.773**	**0.266**	**1.74**	**0.428**	ND	ND
Trichloroethylene (TCE)	**0.124**	ND	ND	ND	ND	**0.161**
Tetrachloroethylene (PCE)	**1.8**	**0.4**	**0.746**	**0.312**	ND	**0.529**
Methylene Chloride	ND	ND	ND	**25.8**	**6.01**	**11.1**
Vinyl Chloride	**0.061**	ND	**0.087**	ND	ND	ND

IA-2	08/23/2019	09/26/2019	09/08/2020	11/19/2020	12/06/2020	02/04/2021	03/04/2021	04/12/2021
VOCs								
Carbon Tetrachloride	**0.403**	**0.497**	**0.453**	**0.428**	**0.396**	**0.44**	**0.491**	**0.428**
Cis-1,2-Dichloroethylene	ND	**1.65**	**1.69**	**0.523**	**1.82**	ND	ND	ND
Trichloroethylene (TCE)	**0.107**	**0.704**	ND	**0.269**	**0.957**	ND	ND	**0.118**
Tetrachloroethylene (PCE)	**0.956**	**5.93**	**0.719**	**0.332**	**2.01**	ND	ND	**0.468**
Methylene Chloride	ND	ND	ND	**112**	**130**	**5.77**	ND	**3.86**
Vinyl Chloride	ND	**0.194**	**0.092**	ND	**0.059**	ND	ND	ND

IA-4	12/03/2019	03/18/2020	09/08/2020	11/19/2020	03/04/2021	03/04/2021 DUP	04/12/2021
VOCs							
Carbon Tetrachloride	**0.428**	**0.396**	**0.421**	**0.434**	**0.522**	**0.459**	**0.403**
Cis-1,2-Dichloroethylene	**1.07**	**1.26**	**1.65**	**0.349**	ND	ND	ND
Trichloroethylene (TCE)	**0.134**	ND	ND	**0.15**	ND	ND	ND
Tetrachloroethylene (PCE)	**2.24**	**0.848**	**0.705**	**0.264**	ND	ND	**0.4**
Methylene Chloride	ND	ND	ND	**61.8**	**2.71**	**2.98**	**4.72**
Vinyl Chloride	**0.1**	**0.064**	**0.087**	ND	ND	ND	ND

IA-14	03/18/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021
VOCs					
Carbon Tetrachloride	**0.396**	**0.447**	**0.459**	**0.541**	**0.396**
Cis-1,2-Dichloroethylene	**1.27**	**1.52**	**0.638**	ND	ND
Trichloroethylene (TCE)	ND	ND	**0.22**	ND	**0.188**
Tetrachloroethylene (PCE)	**1.46**	**0.726**	**0.332**	ND	**0.515**
Methylene Chloride	ND	ND	**81.6**	**1.84**	**6.04**
Vinyl Chloride	**0.064**	**0.082**	ND	ND	ND

IA-3	12/03/2019	01/29/2020	03/17/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021
VOCs							
Carbon Tetrachloride	**0.465**	**0.44**	**0.39**	**0.535**	**0.465**	**0.459**	**0.403**
Cis-1,2-Dichloroethylene	**1.1**	**1.52**	**0.975**	**1.67**	**0.424**	ND	ND
Trichloroethylene (TCE)	**0.328**	**0.134**	ND	ND	**0.236**	ND	ND
Tetrachloroethylene (PCE)	**5.21**	**1.5**	**1.32**	**0.732**	**0.278**	ND	**0.427**
Methylene Chloride	ND	ND	ND	ND	**91.4**	ND	**3.75**
Vinyl Chloride	**0.069**	**0.097**	**0.051**	**0.095**	ND	ND	ND



LEGEND

- SITE BOUNDARY
- SB-10 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION
- SB-3/ TW-3 — APPROXIMATE SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION
- IA-3 — APPROXIMATE INDOOR AIR LOCATION AND DESIGNATION
- SS-7 — APPROXIMATE SUB-SLAB VAPOR LOCATION AND DESIGNATION
- AA-2 — APPROXIMATE AMBIENT AIR SAMPLE LOCATION AND DESIGNATION

TYPICAL DATA BOX INFORMATION

SAMPLE ID# →	AA-2	12/03/2019	03/17/2020	← SAMPLE DATE
ANALYTES →	**VOCs**			
	Carbon Tetrachloride	**0.503**	**0.409**	← CONCENTRATION ($\mu g/m^3$)
	Tetrachloroethylene (PCE)	**0.285**	**0.502**	

- INDOOR AIR DATA
- AMBIENT AIR DATA
- DATA COLLECTED AFTER START-UP OF THE SSDS IS OULINED IN RED

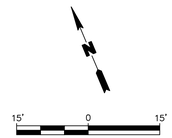
Con entration in g m^3

g m^3 - Micrograms per cubic meter
* - NYSDOH CEH BEEI Soil Vapor Intrusion Guidance of October 2006
NYSDOH - New York State Department of Health
CEH - Center for Environmental Health
BEEI - Bureau of Environmental Exposure Investigation
VOCs - Volatile Organic Compounds
DUP - Duplicate sample
ND - Compound was analyzed for but not detected

Results shown in **bold** have been detected

NOTE:

ONLY DETECTIONS OF THE EIGHT COMPOUNDS SHOWN IN THE NYSDOH GUIDANCE MATRICES A, B, C ARE SHOWN IN THE DATA BOXES. ADDITIONAL DETECTIONS CAN BE REVIEWED ON TABLE 1.



Title:

DETECTIONS OF VOCs IN SUB-SLAB VAPOR, CELLAR INDOOR AIR, AND AMBIENT AIR PRE- AND POST-SSDS START-UP

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	6
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y141.06.DWG		

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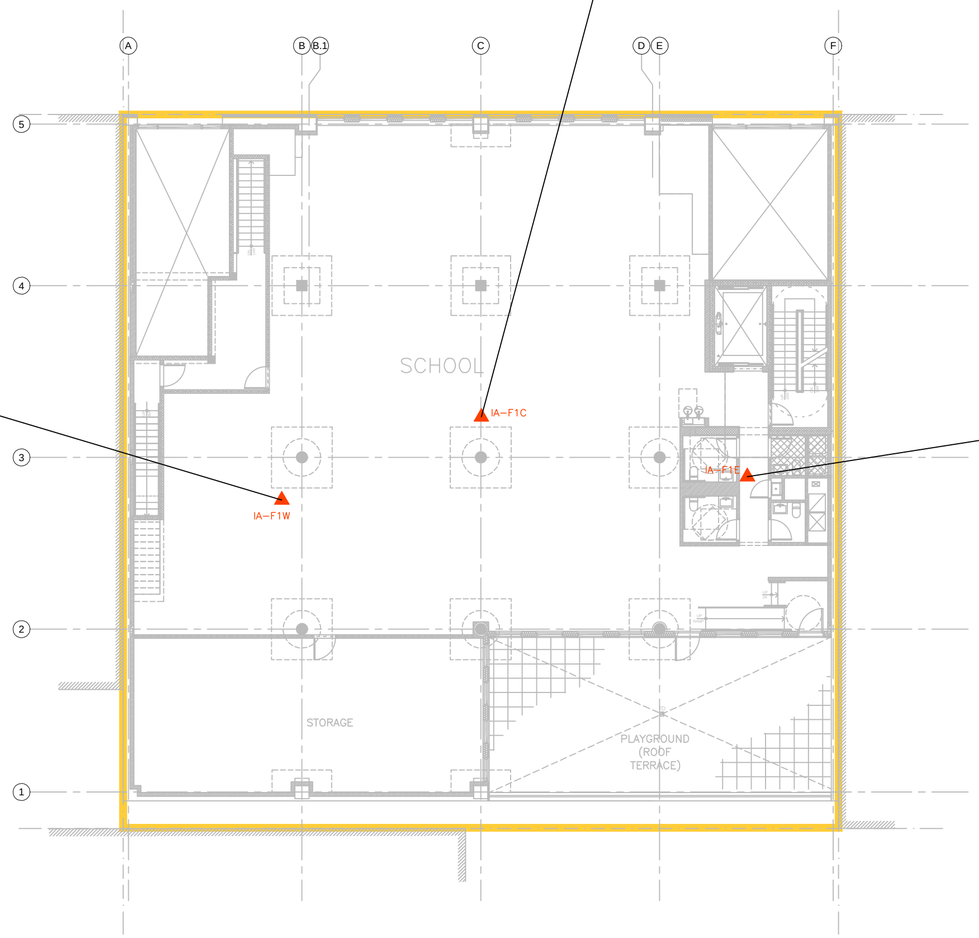
IA-F1C	01/29/2020	03/17/2020	03/17/2020 DUP	11/19/2020	12/06/2020	03/04/2021	04/12/2021
VOCs							
Carbon Tetrachloride	0.403	0.39	0.403	0.453	0.377	0.503	0.421
Cis-1,2-Dichloroethylene	ND	0.456	0.492	0.722	1.13	ND	ND
Trichloroethylene (TCE)	ND	ND	ND	0.661	1.81	0.183	0.183
Tetrachloroethylene (PCE)	0.251	0.807	0.821	0.441	1.76	ND	0.38
Methylene Chloride	ND	ND	ND	73.6	84.4	5.11	9.1



IA-F1W	12/03/2019
VOCs	
Carbon Tetrachloride	0.472
Cis-1,2-Dichloroethylene	0.381
1,1-Dichloroethene	ND
Trichloroethylene (TCE)	0.161
Tetrachloroethylene (PCE)	1.78

IA-F1E	12/03/2019	09/08/2020
VOCs		
Carbon Tetrachloride	0.447	0.459
Cis-1,2-Dichloroethylene	0.547	0.127
Trichloroethylene (TCE)	0.226	ND
Tetrachloroethylene (PCE)	3.62	0.481

LEGEND

SITE BOUNDARY

IA–F1E — APPROXIMATE INDOOR AIR LOCATION AND DESIGNATION

TYPICAL DATA BOX INFORMATION

SAMPLE ID# → | IA-F1E | 12/03/2019 | 09/08/2020 | ← SAMPLE DATE

ANALYTES → | VOCs | | |
Carbon Tetrachloride	0.447	0.459
Cis-1,2-Dichloroethylene	0.547	0.127
Trichloroethylene (TCE)	0.226	ND
Tetrachloroethylene (PCE)	3.62	0.481

→ CONCENTRATION (µg/m³)

INDOOR AIR DATA

DATA COLLECTED AFTER START–UP OF THE SSDS IS OULINED IN RED

Con entration in g m³

g m³ - Micrograms per cubic meter
* - NYSDOH CEH BEEI Soil Vapor Intrusion Guidance of October 2006
NYSDOH - New York State Department of Health
CEH - Center for Environmental Health
BEEI - Bureau of Environmental Exposure Investigation
VOCs - Volatile Organic Compounds
DUP - Duplicate sample
ND - Compound was analyzed for but not detected

Results shown in **bold** have been detected

NOTE:

ONLY DETECTIONS OF THE EIGHT COMPOUNDS SHOWN IN THE NYSDOH GUIDANCE MATRICES A, B, C ARE SHOWN IN THE DATA BOXES. ADDITIONAL DETECTIONS CAN BE REVIEWED ON TABLE 1.

N

15' 0 15'

Title:

DETECTIONS OF VOCs IN FIRST FLOOR INDOOR AIR PRE- AND POST-SSDS START-UP

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	7
Project Mgr: R.H.	Project: 3371.001Y000	
File: 3371.0001Y141.06.DWG		

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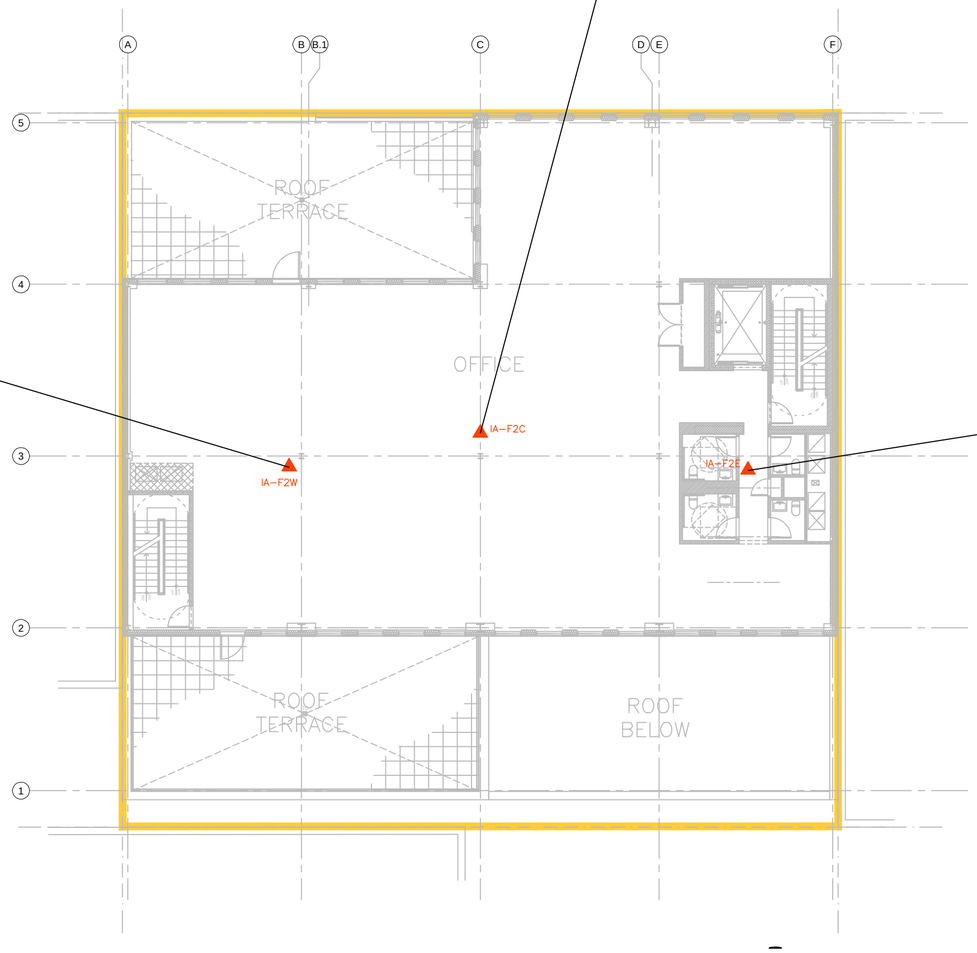
IA-F2C	01/29/2020	03/17/2020	09/08/2020	11/19/2020	12/06/2020	03/04/2021	04/12/2021
VOCs							
Carbon Tetrachloride	0.365	0.415	0.459	0.434	0.396	0.491	0.396
Cis-1,2-Dichloroethylene	ND	0.309	0.139	0.714	0.603	ND	ND
Trichloroethylene (TCE)	ND	ND	ND	0.236	0.344	ND	0.134
Tetrachloroethylene (PCE)	0.136	0.685	0.529	0.427	0.834	ND	0.529
Methylene Chloride	ND	ND	ND	48.6	35.1	2.31	4.38



IA-F2W	12/03/2019
VOCs	
Carbon Tetrachloride	0.459
Cis-1,2-Dichloroethylene	0.408
Trichloroethylene (TCE)	0.107
Tetrachloroethylene (PCE)	1.27

IA-F2E	12/03/2019
VOCs	
Carbon Tetrachloride	0.465
Cis-1,2-Dichloroethylene	0.813
Trichloroethylene (TCE)	0.285
Tetrachloroethylene (PCE)	3.28
Vinyl Chloride	0.102

LEGEND

SITE BOUNDARY

IA–F2E — APPROXIMATE INDOOR AIR LOCATION AND DESIGNATION

TYPICAL DATA BOX INFORMATION

SAMPLE ID# → IA-F2E	12/03/2019 ← SAMPLE DATE
VOCs	
ANALYTES → Carbon Tetrachloride	0.465
Cis-1,2-Dichloroethylene	0.813
Trichloroethylene (TCE)	0.285
Tetrachloroethylene (PCE)	3.28
Vinyl Chloride	0.102

CONCENTRATION (µg/m³)

INDOOR AIR DATA

DATA COLLECTED AFTER START–UP OF THE SSDS IS OULINED IN RED

Con entration in g m^3

g m^3 - Micrograms per cubic meter

* - NYSDOH CEH BEEI Soil Vapor Intrusion Guidance of October 2006

NYSDOH - New York State Department of Health

CEH - Center for Environmental Health

BEEI - Bureau of Environmental Exposure Investigation

VOCs - Volatile Organic Compounds

ND - Compound was analyzed for but not detected

Results shown in **bold** have been detected

NOTE:

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N

15' 0 15'

Title:

DETECTIONS OF VOCs IN SECOND FLOOR INDOOR AIR PRE- AND POST-SSDS START-UP

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

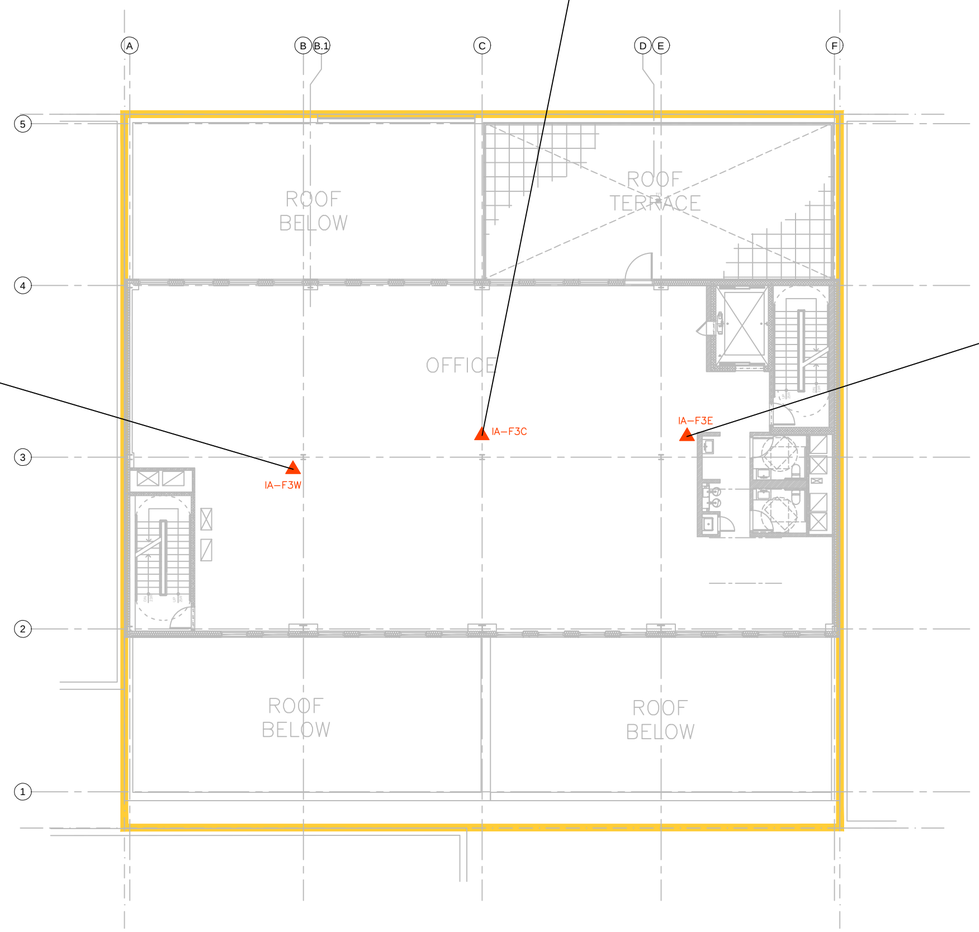
Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	8
Project Mgr: R.H.	Project: 3371.001Y000	
File: 3371.0001Y141.06.DWG		

V:\CAD\PROJECTS\3371Y000\1Y141\3371.0001Y141.06.DWG

IA-F3C	01/29/2020	03/17/2020	09/08/2020	11/19/2020	03/04/2021	04/12/2021
VOCs						
Carbon Tetrachloride	0.384	0.39	0.453	0.478	0.572	0.428
Cis-1,2-Dichloroethylene	0.119	0.329	0.091	0.777	ND	ND
Trichloroethylene (TCE)	ND	ND	ND	0.296	ND	ND
Tetrachloroethylene (PCE)	0.285	0.631	0.468	0.448	ND	0.468
Methylene Chloride	ND	ND	ND	47.2	2.44	4.03

IA-F3E	12/03/2019
VOCs	
Carbon Tetrachloride	0.459
Cis-1,2-Dichloroethylene	0.757
Trichloroethylene (TCE)	0.193
Tetrachloroethylene (PCE)	2.71
Vinyl Chloride	0.067

IA-F3W	12/03/2019
VOCs	
Carbon Tetrachloride	0.415
Cis-1,2-Dichloroethylene	0.884
Trichloroethylene (TCE)	0.231
Tetrachloroethylene (PCE)	3.21
Vinyl Chloride	0.056



LEGEND

SITE BOUNDARY

IA–F2E APPROXIMATE INDOOR AIR LOCATION AND DESIGNATION

TYPICAL DATA BOX INFORMATION

SAMPLE ID# →	IA-F3E	12/3/19 ← SAMPLE DATE
	VOCs	
ANALYTES →	Carbon Tetrachloride	**0.459**
	Trichloroethene	**0.193**
	Cis-1,2-Dichloroethene	**0.757**
	Tetrachloroethene	**2.71**
	Vinyl Chloride	**0.067**

CONCENTRATION (µg/m³)

INDOOR AIR DATA

DATA COLLECTED AFTER START–UP OF THE SSDS IS OULINED IN RED

Con entration in g m^3

g m^3 - Micrograms per cubic meter

* - NYSDOH CEH BEEI Soil Vapor Intrusion Guidance of October 2006

NYSDOH - New York State Department of Health

CEH - Center for Environmental Health

BEEI - Bureau of Environmental Exposure Investigation

VOCs - Volatile Organic Compounds

ND - Compound was analyzed for but not detected

Results shown in **bold** have been detected

NOTE:

ONLY DETECTIONS OF THE EIGHT COMPOUNDS SHOWN IN THE NYSDOH GUIDANCE MATRICES A, B, C ARE SHOWN IN THE DATA BOXES. ADDITIONAL DETECTIONS CAN BE REVIEWED ON TABLE 1.

N

15' 0 15'

Title:

DETECTIONS OF VOCs IN THIRD FLOOR INDOOR AIR PRE- AND POST-SSDS START-UP

11-20 46TH ROAD SITE
BCP SITE NO. C241242

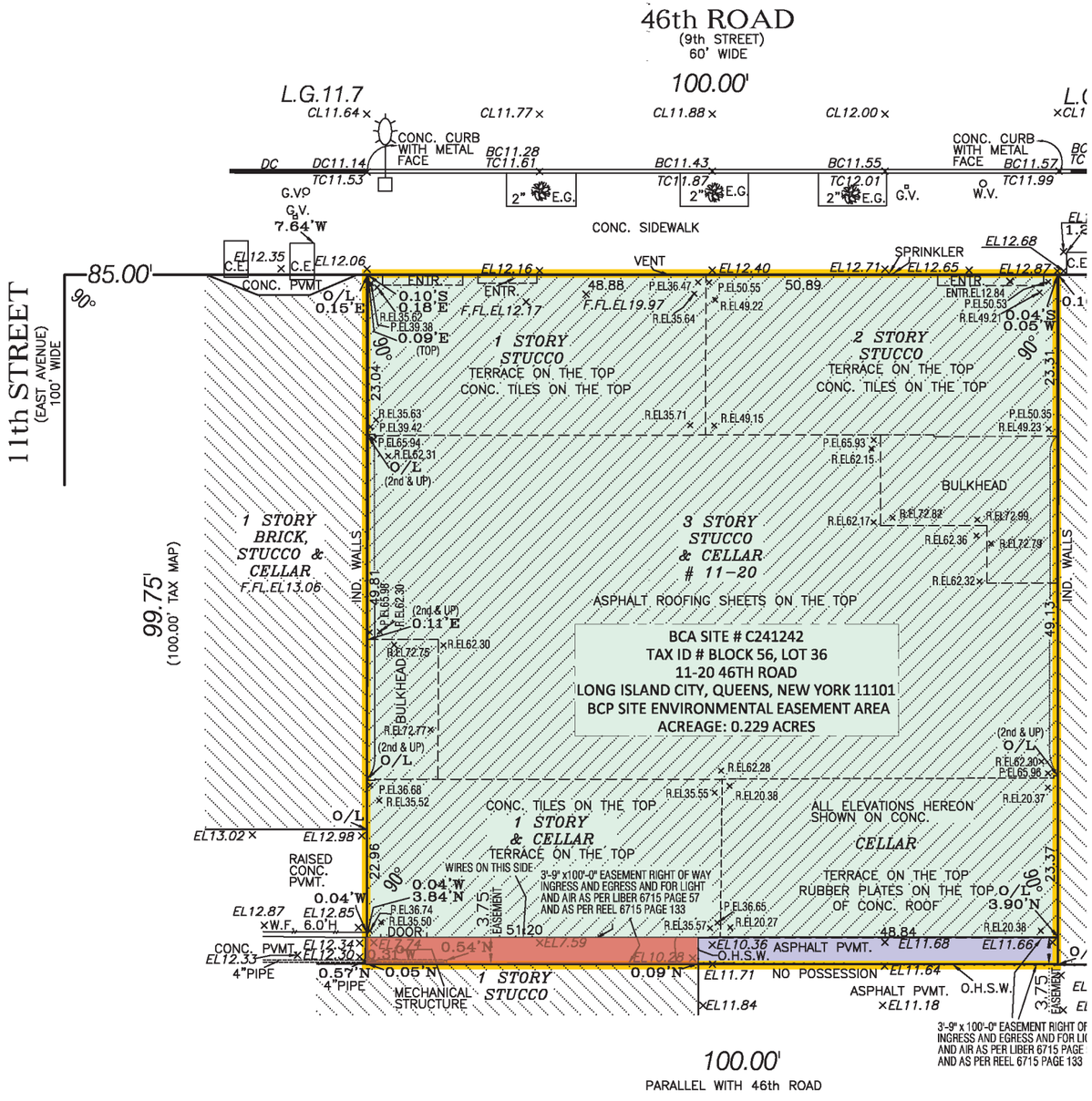
Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

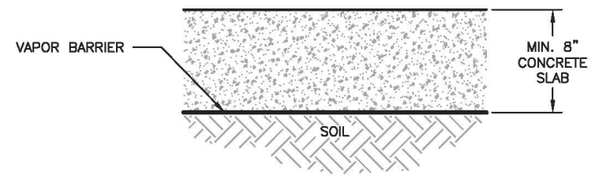
Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: D.E.K.	Scale: AS SHOWN	9
Project Mgr: R.H.	Project: 3371.001Y000	
File: 3371.0001Y141.06.DWG		

V:\CAD\PROJECTS\3371\Y000\Y1\41\3371.0001Y141.06.DWG

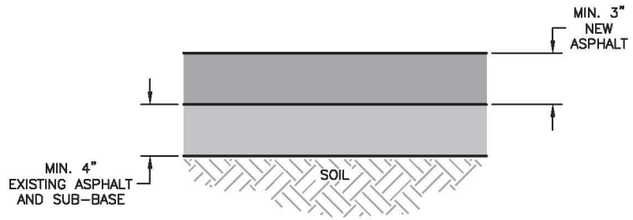


LEGEND

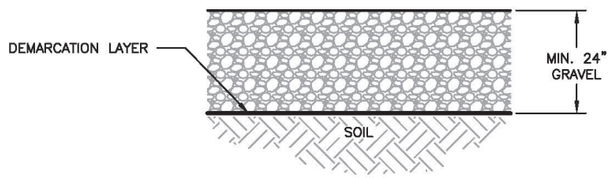
- SITE BOUNDARY
- MINIMUM 8-INCH THICK CONCRETE CELLAR SLAB
- ASPHALT PAVEMENT
- MINIMUM 24-INCH THICK GRAVEL



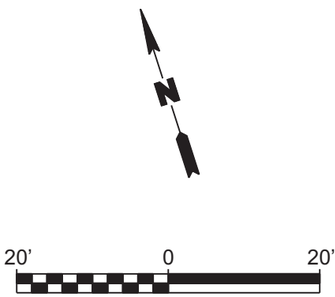
1 TYPICAL SLAB DETAIL
SCALE: NOT TO SCALE



2 TYPICAL SLAB DETAIL
SCALE: NOT TO SCALE



3 TYPICAL GRAVEL DETAIL
SCALE: NOT TO SCALE



Title:

COMPOSITE COVER SYSTEM LAYOUT

11-20 46TH ROAD SITE
BCP SITE NO. C241242

Prepared for:

11-20 46TH ROAD OWNER, LLC

ROUX

Compiled by: R.H.	Date: 15DEC21	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	10
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y141.07.CDR		

\3371Y0001Y141\3371.0001Y141.07.CDR

APPENDICES

A. Environmental Easement, Metes and Bounds, and Survey Map
B. List of Site Contacts
C. Soil Boring and Monitoring Well Construction Logs
D. Excavation Work Plan
E. Health and Safety Plan
F. Quality Assurance Project Plan
G. Site Management Forms
H. Equipment and Device Operations and Maintenance Manuals

APPENDIX A

Environmental Easement, Metes and Bounds, and Survey Map

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.

2021101801295001001E4B67

RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 10**

Document ID: 2021101801295001 Document Date: 09-28-2021 Preparation Date: 10-18-2021
Document Type: EASEMENT
Document Page Count: 9

PRESENTER:
NATIONAL LAND TENURE (NLT-29525-Q-19)
950 FRANKLIN AVENUE
GARDEN CITY, NY 11530
516-227-0800
SLEVIN@NLTCO.COM

RETURN TO:
NATIONAL LAND TENURE
950 FRANKLIN AVENUE
GARDEN CITY, NY 11530

PROPERTY DATA

Borough	Block	Lot	Unit	Address
QUEENS	56	36	Entire Lot	11-20 46TH ROAD

Property Type: OTHER Easement

CROSS REFERENCE DATA

CRFN_____ *or* DocumentID_____ *or* _____ Year_____ Reel____ Page_____ *or* File Number_____

PARTIES

GRANTOR/SELLER:
11-20 46TH ROAD OWNER LLC
C/O SD ASSET MANAGEMENT, LLC, 10 EAST 34TH STREET
NEW YORK, NY 10016-4327

GRANTEE/BUYER:
NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 BROADWAY, 14TH FLOOR
ALBANY, NY 12233-1500

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:	$	82.00
Affidavit Fee:	$	0.00

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

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 10-22-2021 09:54
City Register File No.(CRFN): **2021000417793**

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 28th day of September, 2021 between Owner, 11-20 46th Road Owner LLC, having an office at c/o Caervs Group, LLC, 200 East 58th Street, New York, New York 10022 (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 11-20 46th Road in the City of New York, County of Queens 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 56 Lot 36, being the same as that property conveyed to Grantor by deed dated October 25, 2015 and recorded in the City Register of the City of New York as CRFN # 2015000387928. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.229 +/- acres, and is hereinafter more fully described in the Land Title Survey dated September 28, 2020 prepared by Szczepan Henryk Roguski, L.L.S. of Roguski Land Surveying, P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, 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: C241242-05-20, 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: C241242
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.

11-20 46th Road Owner LLC:

By: _____

Print Name: DAVID SCHWARZ

Title: Authorized Signatory Date: 9/15/2021

Grantor's Acknowledgment

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

On the 15th day of Sept., in the year 20 21, before me, the undersigned, personally appeared David Schwarz, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Notary Public - State of New York

JOHN F KIM
Notary Public - State of New Jersey
My Commission Expires Dec 27, 2024

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: _____
Michael J. Ryan, Director
Division of Environmental Remediation

Grantee's Acknowledgment

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

On the 28th day of September in the year 2021, before me, the undersigned, personally appeared Michael J. Ryan, 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.

_____
Notary Public - State of New York

Dale L. Thiel
Notary Public, State of New York
Qualified in Columbia County
No 01TH6414394
Commission Expires February 2/22/2025

SCHEDULE "A" PROPERTY DESCRIPTION

ALL that certain plot, piece or parcel of land situate, with the buildings and improvements thereon erected, situate, lying and being at Long Island City, in the First Word of the County of Queens, City and State of New York, bounded and described as follows:

BEGINNING at a point on the southwesterly side of 46th Road (9th Street) distant 85 feet southeasterly from the corner formed by the intersection of the Southeasterly side of 11th Street (East Avenue) 100 feet wide, as shown on the Alteration Map Number 3117 to the Topographical Maps of the City of New York for the Borough of Queens, with the said Southwesterly side of 46th Road;

THENCE southwesterly at right angle to 46th Rood, 99.75 feet (100.00 feet tax map);

THENCE southeasterly and parallel with 46th Road, 100 feet;

THENCE northeasterly and again at right angles to 46th Rood 99.75 feet (100.00 feet tax map) to the southwesterly side of 46th Road; and

THENCE northwesterly along the southwesterly side of 46th Road, 100 feet to the point of place of BEGINNING.

SUBJECT to an easement and right of way over the southwesterly 3.75 feet of the above described premises for ingress and egress and for light and air in favor of the premises adjoining on the Southwest.

Said premises being known as 11-20 46th Road, Long Island City, New York.

Area of that certain plot, piece or parcel of land described above is 9,975 square feet (0.229 acres).

GRAPHIC SCALE: 1" = 20'
(IN METERS & FEET)

10F 5F 0 10F 20F 30F 40F 50F 60F
10M 5M 0 10M 20M

METES AND BOUNDS DESCRIPTIONS

Lot metes and bounds dimension discrepancies exist between survey, metes and bounds description based upon survey hereon (land surveyor's opinion), deeds (2015 deeds and 2000 deeds as denoted below) and tax map. Metes and Bounds Descriptions hereon are not prepared by nor certified by the Land Surveyor.

METES AND BOUNDS DESCRIPTION PER FOLLOWING 2015 DEEDS:

(1) Deed, CRFN 2015000387928, Dated 10/20/2015, Recorded 10/29/2015, Party 1 MAJA LLC, Party 2 11-20 46TH ROAD OWNER LLC

AREA INDETERMINATE DUE TO DISCREPANCY BETWEEN DEED REFERENCED "DEED" AND "ACTUAL" DIMENSIONS.

ALL that certain plot, piece or parcel of land situate, lying and being in the Town of Hunter's Point, County of Queens, State of New York bounded and described as follows:

BEGINNING at a point on the Southerly side of 46th Road (9th Street) distant 85 feet Southeasterly from the corner formed by the intersection of the Southeasterly side of 11th Street (East Avenue) 100 feet wide as shown on the Alteration Map Number 3117 to the Topographical Maps of the City of New York for the Borough of Queens, with the said Southwesterly side of 46th Road;

THENCE Southwesterly at right angle to 46th Road, 99.75 feet (deed), 100 feet (tax map and actual);

THENCE Southeasterly and parallel with 46th Road, 100 feet,

THENCE Northeasterly and again at right angles to 46th Street, 99.75 feet (deed), 100 feet (tax map and actual) to the Southwesterly side of 46th Road; and

THENCE Northwesterly along the Southwesterly side of 46th Road, 100 feet to the point of place of BEGINNING.

100 FEET (ACTUAL) IS A LOT METES AND BOUNDS DISCREPANCY AND IS PREPARED BY OTHERS (NOT ROGUSKI LAND SURVEYING, P.C.). 100 FEET (TAX MAP) IS ALSO A LOT METES AND BOUNDS DISCREPANCY.

The above description is drawn in accordance with a Survey made by AAA Group, dated August 9, 2015.

Note: Address, Block & Lot shown for informational purposes only

Designated as Block 56, Lot 36, Queens County, and also known as 11-20 46th Road, Long Island City, N.Y.

DESCRIPTION DENOTES IT IS DRAWN IN ACCORDANCE WITH A SURVEY MADE BY ANOTHER LAND SURVEYOR (NOT SURVEY HEREON NOR ROGUSKI LAND SURVEYING, P.C.)

(2) Deed, CRFN 2015000383403, Dated 10/20/2015, Recorded 10/27/2015, Party 1 NEW YORK CITY INDUSTRIAL DEVELOPMENT AGENCY, Party 2 MAJA LLC

AREA INDETERMINATE DUE TO DISCREPANCY BETWEEN DEED REFERENCED "DEED" AND "ACTUAL" DIMENSIONS.

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of and County of Queens, City and State of New York, bounded and described as follows:

BEGINNING at a point on the Southerly side of 46th Road (9th Street) distant 85 feet Southeasterly from the corner formed by the intersection of the Southeasterly side of 11th Street (East Avenue) 100 feet wide as shown on the Alteration Map Number 3117 to the Topographical Maps of the City of New York for the Borough of Queens, with the said Southwesterly side of 46th Road;

THENCE Southwesterly at right angle to 46th Road, 99.75 feet (deed), 100 feet (tax map and actual);

THENCE Southeasterly and parallel with 46th Road, 100 feet,

THENCE Northeasterly and again at right angles to 46th Street, 99.75 feet (deed), 100 feet (tax map and actual) to the Southwesterly side of 46th Road; and

THENCE Northwesterly along the Southwesterly side of 46th Road, 100 feet to the point of place of BEGINNING.

100 FEET (ACTUAL) IS A LOT METES AND BOUNDS DISCREPANCY AND IS PREPARED BY OTHERS (NOT ROGUSKI LAND SURVEYING, P.C.). 100 FEET (TAX MAP) IS ALSO A LOT METES AND BOUNDS DISCREPANCY.

METES AND BOUNDS DESCRIPTION PER FOLLOWING 2000 DEEDS:

(1) Deed, Dated 10/19/2000, Recorded 11/9/2000, Party 1 MAJA LLC, Party 2 NYC INDUSTRIAL DEVELOPMENT AGENCY

AREA OF THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND DESCRIBED IS 9,975 SQUARE FEET (0.229 ACRES).

ALL that certain plot, piece or parcel of land situate, lying and being at Long Island City, in the First Ward of the County of Queens, City of New York and State of New York, bounded and described as follows:

BEGINNING at a point on the Southwesterly side of 46th Road (9th Street) distant 85 feet Southeasterly from the corner formed by the intersection of the Southeasterly side of 11th Street (East Avenue) 100 feet wide, as shown on the Alteration Map Number 3117 to the Topographical Maps of the City of New York for the Borough of Queens, with the said Southwesterly side of 46th Road;

THENCE Southwesterly at right angle to 46th Road, 99.75 feet;

THENCE Southeasterly and parallel with 46th Road, 100 feet;

THENCE Northeasterly and again at right angles to 46th Road 99.75 feet to the Southwesterly side of 46th Road; and

THENCE Northwesterly along the Southwesterly side of 46th Road, 100 feet to the point of place of BEGINNING.

SUBJECT to an easement and right of way over the Southwesterly 3.75 feet of the above described premises for ingress and egress and for light and air in favor of the premises adjoining on the Southwest.

(2) Deed, Dated 10/19/2000, Recorded 11/9/2000, Party 1 11-20 REALTY CORP, Party 2 MAJA LLC

AREA OF THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND DESCRIBED IS 9,975 SQUARE FEET (0.229 ACRES).

ALL that certain plot, piece or parcel of land situate, with the buildings and improvements thereon erected, situate, lying and being at Long Island City, in the First Ward of the County of Queens, City and State of New York, bounded and described as follows:

BEGINNING at a point on the southwesterly side of 46th Road (9th Street) distant 85 feet southeasterly from the corner formed by the intersection of the Southeasterly side of 11th Street (East Avenue) 100 feet wide, as shown on the Alteration Map Number 3117 to the Topographical Maps of the City of New York for the Borough of Queens, with the said Southwesterly side of 46th Road;

THENCE southwesterly at right angle to 46th Road, 99.75 feet;

THENCE southeasterly and parallel with 46th Road, 100 feet;

THENCE northeasterly and again at right angles to 46th Road 99.75 feet to the southwesterly side of 46th Road; and

THENCE Northwesterly along the southwesterly side of 46th Road, 100 feet to the point of place of BEGINNING.

SUBJECT to an easement and right of way over the Southwesterly 3.75 feet of the above described premises for ingress and egress and for light and air in favor of the premises adjoining on the Southwest.

Said premises being known as 11-20 46th Road, Long Island City, New York.

The Grantor is the same as the Grantee in a deed October 28, 1954 and recorded November 3, 1954 Liber 6715 cp 57.

METES AND BOUNDS DESCRIPTION BASED UPON SURVEY HEREON (LAND SURVEYOR'S OPINION)

Lot metes and bounds dimension discrepancies exist between survey, metes and bounds description based upon survey hereon (surveyor's opinion), deeds (2015 deeds and 2000 deeds as denoted in section above) and tax map.

ALL that certain plot, piece or parcel of land situate, with the buildings and improvements thereon erected, situate, lying and being at Long Island City, in the First Ward of the County of Queens, City and State of New York, bounded and described as follows:

BEGINNING at a point on the southwesterly side of 46th Road (9th Street) distant 85 feet southeasterly from the corner formed by the intersection of the Southeasterly side of 11th Street (East Avenue) 100 feet wide, as shown on the Alteration Map Number 3117 to the Topographical Maps of the City of New York for the Borough of Queens, with the said Southwesterly side of 46th Road;

THENCE southwesterly at right angle to 46th Road, 99.75 feet (100.00 feet tax map);

THENCE southeasterly and parallel with 46th Road, 100 feet;

THENCE northeasterly and again at right angles to 46th Road 99.75 feet (100.00 feet tax map) to the southwesterly side of 46th Road; and

THENCE northwesterly along the southwesterly side of 46th Road, 100 feet to the point of place of BEGINNING.

SUBJECT to an easement and right of way over the southwesterly 3.75 feet of the above described premises for ingress and egress and for light and air in favor of the premises adjoining on the Southwest.

Said premises being known as 11-20 46th Road, Long Island City, New York.

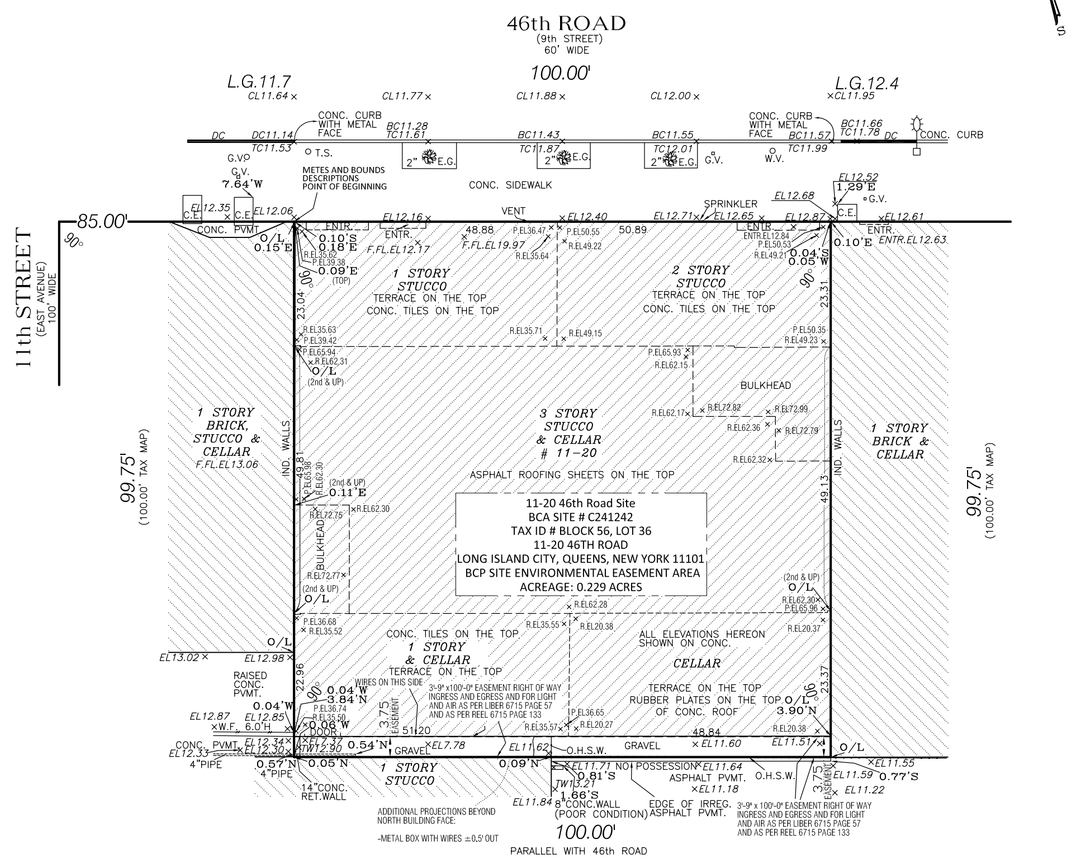
The Grantor is the same as the Grantee in a deed October 28, 1954 and recorded November 3, 1954 Liber 6715 cp 57.

Area of that certain plot, piece or parcel of land described above is 9,975 square feet (0.229 acres).

THE OFFSETS OR DIMENSIONS SHOWN FROM THE STRUCTURES TO THE PROPERTY LINES ARE FOR A SPECIFIC PURPOSE AND USE AND THEREFORE ARE NOT INTENDED TO GUIDE THE ERECTION OF FENCES, RETAINING WALLS, POOLS, PLANTING AREAS, ADDITIONS TO STRUCTURES AND ANY OTHER CONSTRUCTION. ENCROACHMENTS OR VAULTS, IF ANY, BELOW SURFACE ARE NOT SHOWN.

Job No. RLS200879

THE EXISTENCE OF RIGHT OF WAYS AND/OR EASEMENTS OF RECORD, IF ANY, NOT SHOWN ARE NOT CERTIFIED.



LEGEND:
AIR CONDITIONER — A.C.
CELLAR ENTRANCE — C.E.
CHAIN LINK FENCE — C.L.F.
PLATFORM — PLT.
PAVEMENT — PVMT.
EARTHEN GROUND — E.G.
CONCRETE — CONC.
OVER HEAD SERVICE WIRE — O.H.S.W.
METAL DOOR — M.D.
METAL COVER — M.C.
FIRE ESCAPE — F.E.
UTILITY POLE — ⊗
WOOD FENCE — W.F.
VINYL FENCE — V.F.
METAL FENCE — M.F.
BAY WINDOW — B.W.
AREA WAY — A.W.
ON LINE — O/L
TREE —
GAS VALVE — G.V.
WATER VALVE — W.V.
EXISTING ELEVATION — EL 43.54
BOTTOM OF CURB — BC 43.03
CENTER LINE OF STREET — CL 43.54
TOP OF CURB — TC 43.54
DROP CURB — DC 43.54
LEGAL GRADES: — L.G.43.60
TOP OF WALL — TW 43.54
PARAPET WALL ELEVATION - P.EL
ROOF ELEVATION - R.EL
TRAFFIC SIGNAL - T.S.

NOTES:

1. UNLESS OTHERWISE NOTED, ELEVATIONS AND LEGAL GRADES SHOWN ON THIS SURVEY ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), AS ESTABLISHED AND MAINTAINED BY THE NATIONAL GEODETIC SURVEY OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, OR SUCCESSOR AGENCY, WHICH IS ESTABLISHED AS THE CITY DATUM BY LOCAL LAW 96 OF 2013.

2. ROOF SURVEY EXCLUDED.

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.

FOR EASEMENT PURPOSES USE ONLY
FOR BUILDING DEPARTMENT USE ONLY

TOTAL LOT AREA AND ENVIRONMENTAL EASEMENT AREA IS 9975.0 sq.ft. =0.229 ACRES
ENVIRONMENTAL EASEMENT IS ENTIRETY OF LOT 36 IN BLOCK 56 (QUEENS)

SURVEY OF: *Described Property*
LOCATED AT:
11-20 46th Road, Long Island City Borough and County of Queens City and State of New York
TAX DESIG: *Block 56 Lot 36*
CERTIFIED TO:
-The People of the State of New York acting through its Commissioner of the Department of Environmental Conservation
-11-20 46th Road Owner LLC
-Knaut Shaw LLP

ROGUSKI LAND SURVEYING, P.C.
TITLE • ARCHITECTURAL • BOUNDARY • CONSTRUCTION
56-39 61st STREET, MASPETH, N.Y. 11378
Tel. • (718)480-3761 •Fax. • (718)480-3762 •
Email • info@rogusklls.net•
SZCZEPAN H. ROGUSKI
PROFESSIONAL LAND SURVEYOR
DATE: September 28, 2020
SCALE: 1"=20'
DRAWN BY WM

UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW. COPIES OF THIS SURVEY MAP NOT BEARING THE LAND SURVEYOR'S INKED SEAL OR EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE A VALID TRUE COPY.

CERTIFICATION INDICATED HEREON SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.

STATE OF NEW YORK
SZCZEPAN HENRYK ROGUSKI
050775
LICENSED LAND SURVEYOR

APPENDIX B

List of Site Contacts

APPENDIX B – LIST OF SITE CONTACTS

This Appendix should include a listing of all site contacts. The table below should be edited as necessary to include all site contacts necessary for implementation of the SMP.

Name	**Phone/Email Address**
Site Owner/Remedial Party: 11-20 46th Road Owner LLC	(917) 485-1733 Owner's Representative: David Schwarz dschwarz@caerusgp.com
Qualified Environmental Professional: David Kaiser, P.E. Roux Environmental Engineering and Geology, D.P.C.	(631) 232-2600 (Office) dkaiser@rouxinc.com
NYSDEC Site Control: Kelly Lewandowski	(518) 402-4569 Kelly.lewandowski@dec.ny.gov
NYSDEC Project Manager: Christopher Allan	(718) 482-4065 Christopher.allan@dec.ny.gov
NYSDEC Project Manager's Supervisor: Mandy Yau, NYSDEC	(718) 482-4897 mandy.yau@dec.ny.gov
Chief, NYSDEC, Superfund and Brownfield Cleanup Section: Jane O'Connell, NYSDEC	jane.oconnell@dec.ny.gov
NYSDOH Project Manager: Gregory Rys	Gregory.rys@health.ny.gov
NYSDOH Project Manager's Supervisor: Scarlett McLaughlin	scarlett.mclaughlin@health.ny.gov

APPENDIX C

Soil Boring and Monitoring Well Construction Logs

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-1	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**10/21/19-10/21/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**2.97 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to medium SAND, some Silt, little fine Gravel, Brick, and Concrete, trace coarse gravel (FILL); moist.			Vapor barrier.
1			G		1
		Brown, fine to medium SAND, some Silt, Brick, and Concrete, little fine Gravel and Clay (FILL); moist.		0.0	
2			G		2 Collect SB-1 (0-2) and DUP-10212019_SO for TCL VOCs.
		Dark brown, fine to coarse SAND, some Silt and fine Gravel, trace brick (FILL); wet.		0.0	
3			G		3 Temporary well TW-1 installed to 5.50' bls. Groundwater encountered at 2.97' bls.
		Dark brown, fine to coarse SAND and fine GRAVEL, some Silt, trace coarse gravel and brick (FILL); wet.		3.6	
4			G		4 Odor.
				22.8	
5			G		5
					End of boring 5.5' bls.

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SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-2	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**10/21/19-10/21/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**4.50 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		CONCRETE.				
		Light brown to gray, fine to medium SAND, some fine to coarse Gravel and Concrete (FILL); moist.				Vapor barrier.
1				G		1
		Brown, fine to medium SAND, some Silt, little fine to coarse Gravel, trace brick (FILL); moist.			0.2	
2				G		2
		Brown, fine to medium SAND, some Silt, little fine to coarse Gravel and Clay, trace brick (FILL); moist.			0.2	
3				G		3 Collect SB-2 (1-3) for TCL VOCs.
		Dark brown, fine to medium SAND and fine GRAVEL, some Silt, trace brick and coarse gravel (FILL); wet.			0.0	
4				G		4 Odor.
					0.7	Temporary well TW-2 installed to 5.50' bls. Groundwater encountered at 4.50' bls.
5				G		5
						End of boring at 5.5' bls.

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-3	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/10/19-12/10/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**1.95 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel, Brick, and Cobbles (FILL); moist.			Vapor barrier.
1			G		1
2			G		2 Temporary well TW-3 installed to 6.90' bls. Groundwater encountered at 1.95' bls.
		Brown, fine to coarse SAND, some fine to coarse Gravel, Brick, and Cobbles (FILL); wet.		0.7	
3			G		3 Collect SB-3 (1-3) for TCL VOCs.
				0.5	
4			G		4
5			G		5
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; wet.			Odor and staining.
				4.9	
6			G		6
			G		Collect SB-3 (5-7) for TCL VOCs.
7					End of boring 7' bls. 7

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-4	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/10/19-12/10/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**1.40 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; moist.			Vapor barrier.
1			G		1
					Temporary well TW-4 installed to 6.20' bls. Groundwater encountered at 1.40' bls.
2			G		2 Odor.
				17.2	
3			G		3
		Dark Brown, fine to coarse SAND, some fine to coarse Gravel and Peat; wet.			
				44.5	
4			G		4
5			G		5 Odor and staining. Collect SB-4 (3-5) for TCL VOCs.
				47.3	
6			G		6
					Collect SB-4 (5-7) for TCL VOCs.
7			G		End of boring 7' bls. 7

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-5	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/10/19-12/10/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**2.25 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel; moist.			Vapor barrier.
1			G		1
2			G		2
					Temporary well TW-5 installed to 7.35' bls. Groundwater encountered at 2.25' bls.
3			G	0.5	3
		Dark Brown, fine to coarse SAND, some fine to coarse Gravel; wet.			
4			G		4
5			G		5
					Collect SB-5 (5-7) for TCL VOCs.
					Odor and staining.
				37.6	
6			G		6
7			G		7
					End of boring 7.5' bls.

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-6	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/9/19-12/9/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**2.05 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; moist.			Vapor barrier.
1			G		
2			G		Temporary well TW-6 installed to 5.35' bls. Groundwater encountered at 2.05' bls.
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; moist.		1.1	
3			G		Collect SB-6 (1-3) for TCL VOCs.
4			G		
5			G		
				6.5	
6			G		
					Collect SB-6 (5-7) for TCL VOCs.
7			G		
					End of boring 7.5' bls.

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-7	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/9/19-12/9/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**1.90 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; moist.			Vapor barrier.
1			G		1
2			G		Temporary well TW-7 installed to 6.62' bls. Groundwater encountered at 1.90' bls. 2
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; wet.			
				0.4	
3			G		3
4			G		4
5			G		5
				0.5	
6			G		6
			G		Collect SB-7 (5-7) for TCL VOCs.
7					End of boring at 7' bls. 7

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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Fax: (631) 232-9898

SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-8	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/11/19-12/11/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**0.60 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"		PID Values (ppm)	REMARKS
		CONCRETE.				
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; moist.				Vapor barrier. Temporary well TW-1 installed to 7.35' bls. Groundwater encountered at 0.6' bls.
1		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; wet.		G		
					5.8	
2				G		Collect SB-8 (0-2) for TCL VOCs.
3				G		
					1.6	
4				G		
5				G		
						Collect SB-8 (4-6) for TCL VOCs.
6				G		
7						End of boring 7.5' bls.

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-9	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/10/19-12/10/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**3.00 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; moist.			Vapor barrier.
1			G		1
2			G	34.6	2
3			G		3
		Dark brown, CLAY, some fine to coarse Sand, fine to coarse Gravel, and Peat; wet.			Wet at 3'.
4			G		4
					Collect SB-9 (2-4) for TCL VOCs.
5			G		5
6			G	1.0	6
					Odor.
			G		Collect SB-9 (5-7) for TCL VOCs.
7					End of boring 7' bls. 7

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-10	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/11/19-12/11/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**3.00 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel and Cobbles; moist.			Vapor barrier.
1			G		1
2			G		2
				5.0	
3		Dark Brown, fine to coarse SAND, some Clay and fine to coarse Gravel; wet.	G		3 Wet at 3'.
4			G		4
5			G		5 Collect SB-10 (3-5) for TCL VOCs.
				33.4	
6			G		6 Odor and staining.
			G		Collect SB-10 (5-7) for TCL VOCs.
7					End of boring 7' bls. 7

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

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Fax: (631) 232-9898

SOIL BORING LOG

WELL NO.	LATITUDE	LONGITUDE		
SB-11	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
3371.0001Y000 / 11-20 46th Rd.		**Long Island City**		
APPROVED BY	LOGGED BY	**Queens, New York**		
R. Henke	**C.Wygel**			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
Trinity / J. Sakellis		**Long Island City, Queens**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
4" / Hand Auger	**4-inches**	**/ Hand Auger**	**4" Hand Auger**	**12/11/19-12/11/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**3.00 (Feet BLS)**	**Cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		CONCRETE.			
		Brown, fine to coarse SAND, some fine to coarse Gravel and Brick (FILL); moist.			Vapor barrier.
1			G		1
2			G		2
3			G	3.7	3
		Dark brown, fine to coarse SAND, some fine to coarse Gravel; wet.			Wet at 3'. Collect SB-11 (1-3) for TCL VOCs.
4			G		4
5			G		5
6			G	70.2	6
					Odor and staining.
			G		Collect SB-11 (5-7) for TCL VOCs.
7					End of boring 7' bls. 7

BORING/FEET 3371.0001Y000.GPJ ROUX.GDT 12/18/19

SB-12

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: S. Edmonds

Start to Finish Date: 1/13/2020 - 1/13/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 15 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 8 feet
Area: Long Island City, Queens	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD		Brown, fine to coarse SAND with some Brick, some Gravel [FILL].			0	Vapor barrier observed.
						0	
	MIXD		Light brown, fine SAND with some Glass [FILL].	G	5	0.1	Collect SB-12 (0-2).
	MIXD		Light brown, fine SAND with trace glass [FILL].			0.1	
	MIXD		Light brown, fine SAND with trace gravel [FILL].				
5			Light brown, fine SAND.			0.0	
	SP						Collect soil vapor sample SV-13 at 6 ft bls.
			Dark grey to black, coarse SAND; wet.	G	2.5	0.0	Collect groundwater sample TW-9.
	SP						
10			Dark grey to black, coarse to fine SAND; wet.			9	
	SP						
			Dark grey to black, fine SAND with some Clay; wet.	G	5	5.1	5 ft screen set at 12 ft bls.
	SP						
	PT		PEAT; wet.				Peat at bottom of borehole.

Bottom of borehole at 15 feet

ROUX STANDARD LOG_ - 5/1/20 17:12 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

SB-13

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: S. Edmonds

Start to Finish Date: 1/13/2020 - 1/13/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 15 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 10 feet
Area: Long Island City, Queens	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD	Brown, fine to coarse SAND with some Brick, some Gravel [FILL]			0	Vapor barrier observed.
	MIXD	Light brown, fine to coarse SAND with some Gravel, trace cobble [FILL].			0	
	MIXD	Dark brown to light brown, fine to coarse SAND with some Gravel and some Fabric [FILL].	G	5	0.1	Collect sample SB-2 (0-2).
	MIXD	Light brown, fine SAND.			85	
	SP	Light brown, fine SAND with trace gravel and trace brick [FILL].			0.0	
5	SP	Light brown, fine to coarse SAND with some brick [FILL]				Collect soil vapor sample SV-14 at 6 ft bls.
	SP	Dark brown, fine to coarse SAND	G	2.5	80	
	SP	Dark grey to black SAND with some Gravel.			67.8	Collect groundwater sample TW-10.
10	SP	Dark grey to black SAND; wet.			38	
	SP		G	5	35	
	SP-SC	Dark grey to black CLAY with some SAND; wet.			30	
	PT	PEAT; wet.				Peat at bottom of borehole.
		Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 5/1/20 17:13 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

SB-14

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: S. Edmonds

Start to Finish Date: 1/13/2020 - 1/13/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 15 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 10 feet
Area: Long Island City, Queens	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	MIXD	Dark brown to light brown, fine SAND with some Glass, some Gravel and trace brick [FILL].			3	Vapor barrier observed.
			G	5	2.6	Collect soil sample SB-14 (0-2).
					3.5	Collect soil vapor sample SV-15 at 2 ft bls.
	SP	Dark brown to black, fine SAND with some Silt and trace brick [FILL]			5.0	
5		Dark brown, silty SAND with some Sheen.				Sheen observed from 5 to 8 ft bls.
			G	2.5	80	Collect groundwater sample TW-11
10	SP				86	
			G	2	90	
		Bottom of borehole at 15 feet				

ROUX STANDARD LOG_ - 5/1/20 17:13 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

SB-15

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: J.Carames

Start to Finish Date: 3/16/2020 - 3/16/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 7 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 3.00 feet
Area: Long Island City, Queens	Elevation: 6.41	Northing: 210825.44	Easting: 998150.04

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		Concrete.				
	MIXD		Brown, fine-coarse SAND, some Gravel/Cobble, trace brick (FILL); moist.				Vapor barrier observed under concrete.
	MIXD		Light brown, fine-coarse SAND, some Gravel/Cobble, trace brick (FILL); moist.	G	5	0	Collected sample SB-15 (0-2).
	MIXD		Light brown, fine-coarse SAND, some Gravel/Cobble, trace gravel/brick (FILL); wet.				Groundwater observed at 3'.
5	MIXD		Brown, fine to coarse SAND, trace gravel/brick (FILL); wet.	G	2	0	
			Bottom of borehole at 7 feet				

ROUX STANDARD LOG_ - 3/26/20 13:11 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

SB-16

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: J.Carames

Start to Finish Date: 3/16/2020 - 3/16/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 5 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 3.00 feet
Area: Long Island City, Queens	Elevation: 6.48	Northing: 210856.16	Easting: 998106.73

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		Concrete.				
	MIXD		Brown, fine to coarse SAND, some Gravel/Cobble, trace brick (FILL); moist.				
1							
	MIXD		Dark brown, fine to coarse SAND, some Gravel/Cobble, trace brick (FILL); moist.				
2						0	Odor. Collected samples SB-18 (0-2), SB-18 (0-2) MS
	MIXD		Dark brown, fine to coarse SAND, some Gravel/Cobble, trace brick (FILL); moist.	G	5		
3							Odor. Groundwater observed at 3'.
	MIXD		Dark brown, fine to coarse SAND, some Gravel/Cobble, trace brick (FILL); wet.				
4						0	Odor.
	MIXD		Dark brown, fine to coarse SAND, some Gravel/Cobble, trace brick (FILL); wet.				Odor. Collected samples SB-16 (3-5), SB-18 (4-6) MSD
			Bottom of borehole at 5 feet				

ROUX STANDARD LOG_ - 3/26/20 13:11 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

SB-17

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: J.Carames

Start to Finish Date: 3/16/2020 - 3/16/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 6 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 3.00 feet
Area: Long Island City, Queens	Elevation: 6.45	Northing: 210807.97	Easting: 998117.99

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		Concrete.				
	MIXD		Brown, fine-coarse SAND, some Gravel/Cobbles/Brick (FILL); moist.			15.3	Odor. Odor.
	MIXD		Brown, fine-coarse SAND, some Gravel/Cobbles, trace brick (FILL); moist.	G	5	40.2	Odor.
	MIXD		Dark brown, fine-coarse SAND, some Gravel/Cobbles (FILL); wet.			2.4	Odor. Water table observed at 3'. No odor.
5				G	0.9 1	1.3	

Bottom of borehole at 6 feet

ROUX STANDARD LOG - 3/26/20 13:11 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

SB-18

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: J.Carames

Start to Finish Date: 3/17/2020 - 3/17/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 6 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 3.00 feet
Area: Long Island City, Queens	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		Concrete.				
	MIXD		Light brown, fine-coarse SAND, some Cobbles/Gravel/Brick (FILL); moist.			0.6	
	MIXD		Light brown, fine-coarse SAND, some Cobbles/Gravel/Brick (FILL); moist.			1.0	Odor. Collected samples SB-18 (0-2), SB-18 (0-2) MS.
	MIXD		Brown, fine-coarse SAND, some Gravel/Cobble/Brick, trace glass (FILL); moist.	G	5	1.4	Odor and staining. Groundwater observed at 3'.
	MIXD		Dark brown, fine-coarse SAND, some Gravel/Cobble/Brick (FILL), trace silt; moist.			80.9	Odor and staining.
5	SP-SM		Dark brown, fine to coarse SAND and GRAVEL, trace silt; wet.	G	1	10.2	Odor. Collected samples SB-16 (3-5), SB-18 (4-6) MSD.
			Bottom of borehole at 6 feet				

ROUX STANDARD LOG - 3/26/20 13:11 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

SB-19

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: J.Carames

Start to Finish Date: 3/17/2020 - 3/17/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 6 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 3.00 feet
Area: Long Island City, Queens	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		Concrete.				
	MIXD		Brown, fine-coarse SAND, some Gravel/Cobbles/Brick (FILL); moist.				Odor.
	MIXD		Dark brown, fine-coarse SAND, little Gravel/Cobbles/Brick (FILL); moist.			26.2	Odor.
	MIXD		Dark brown, fine-coarse SAND, little Gravel/Cobbles/Brick (FILL); moist.	G	5	1.0	
	ML		Dark brown, fine-coarse SAND and GRAVEL, trace silt; wet.			0.1	Water observed at 3'.
						0.1	
5				G	1	0.1	
						0.5	
			Bottom of borehole at 6 feet				

ROUX STANDARD LOG - 3/26/20 13:11 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

ROUX

SB-20

Client: 11-20 46th Road Owner, LLC	Site: 11-20 46th Road	Project Number: 3371.0001Y000
Address: 11-20 46th Road, Long Island City, NY	City/State: Queens, New York	Logged By: J.Carames

Start to Finish Date: 3/16/2020 - 3/16/2020	Contractor: Trinity	Drill Type: Hand Auger	Sampler Type/Method: 4" Hand Auger
Borehole Depth: 6 feet	Backfill: Cuttings	Borehole Diameter: 4-inches	DTW: 3.00 feet
Area: Long Island City, Queens	Elevation: NM	Northing: NM	Easting: NM

Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	CONC		Concrete.				
	MIXD		Light brown, fine-coarse SAND, some Gravel/Cobbles/Brick (FILL); moist.				
	MIXD		Light brown, fine-coarse SAND, some Gravel/Cobbles/Brick (FILL); moist.				
	MIXD		Brown, fine-coarse SAND, some Gravel/Cobbles/Brick (FILL); moist.	G	5	0	
	MIXD		Dark brown, fine-coarse SAND, little Gravel/Cobbles/Brick (FILL); wet.				Staining. Water observed at 3'.
	SW		Dark gray, fine to coarse SAND, some Gravel, little Silt; wet.				Staining.
5	SW		Dark gray, fine-coarse SAND, some Gravel and Silt; wet.	G	1	10.1	Odor and staining.
			Bottom of borehole at 6 feet				Odor and staining.

ROUX STANDARD LOG_ - 3/26/20 13:11 - S:\GINT\PROJECTS\3371.0001Y000.GPJ

APPENDIX D

Excavation Work Plan

APPENDIX E – EXCAVATION WORK PLAN (EWP)

E-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 the table below. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix B of the Site Management Plan (SMP).

Table 1. Notifications*

Christopher Allan, NYSDEC Project Manager	718-482-4065 Christopher.allan@dec.ny.gov
Mandy Yau, NYSDEC	718-482-4897 mandy.yau@dec.ny.gov
Jane O'Connell, NYSDEC Regional HW Engineer	718-482-4599 jane.oconnell@dec.ny.gov
Kelly Lewandowski, NYSDEC Site Control	518-402-4569 Kelly.lewandowski@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 Site Cover System, 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;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix E of this 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.

E-2 SOIL SCREENING METHODS

Visual, olfactory, and instrument-based (e.g. photoionization detector [PID]) soil screening will be performed by a qualified environmental professional (QEP) during all excavations into known or potentially contaminated material (remaining contamination) or a breach of the cover system. A qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE 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 offsite disposal and material that requires testing to determine if the material can be reused onsite as soil beneath the Site Cover System or if the material can be used as cover soil. Further discussion of offsite disposal of materials and onsite reuse is provided in Sections E-6 and E-7, respectively, of this EWP.

E-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.

Water will be available onsite at suitable supply and pressure for use in dust control.

E-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE 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 (RP) (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this EWP.

The presence of utilities and easements on the Site will be investigated by the QEP. 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).

A truck wash will be operated onsite, as appropriate. The QEP or their designated representative 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 offsite in an appropriate manner.

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

The QEP or their designated representative 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.

E-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 New York Codes, Rules and Regulations (NYCRR) Part 364. Haulers will be appropriately licensed and trucks properly placarded.

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

Truck transport routes are as follows:

- Trucks will enter the Site from the Long Island Expressway (I-495) heading east; take the Van Dam exit (Exit 15) and continue onto Borden Ave. Turn right onto Jackson Avenue and then turn left onto 11th Street. Continue until 46th Road and turn right and enter the Site.
- Trucks will turn right to exit the Site and turn right onto 21st Street and then turn left onto Jackson Avenue and then turn right on 51st Avenue and then turn left onto Vernon Boulevard. Turn left onto Borden Avenue and then enter the ramp to the Long Island Expressway (I-495).
- A truck route map is included as Figure 1 of this EWP. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting offsite 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 project 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 onsite in order to minimize offsite disturbance. Offsite queuing will be minimized to the extent practical.

E-6 MATERIALS DISPOSAL OFFSITE

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 this Site is proposed for unregulated offsite 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 offsite management of materials from this Site will not occur without formal NYSDEC project manager approval.

Offsite 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, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, construction and demolition (C&D) debris recovery facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report (PRR). 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 offsite will be handled consistent with 6 NYCRR Parts 360, 361, 362, 363, 364, and 365. Material that does not meet Unrestricted Use Soil Cleanup Objectives (UUSCOs) is prohibited from being taken to a New York State (NYS) C&D debris recovery facility (6 NYCRR Subpart 361-5 registered or permitted facility).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in the NYSDEC to be C&D materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C&D facility without permit modifications only upon prior notification of the NYSDEC Region 2 DMM.

E-7 MATERIALS REUSE ONSITE

The qualified environmental professional as defined in 6 NYCRR part 375 will ensure that procedures defined for material reuse in this SMP are followed and that unacceptable material (i.e. contaminated) does not remain onsite. Contaminated onsite material, including historic fill and contaminated soil, that is acceptable for reuse onsite will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

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, January 2021 guidance values. 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 E-2 and E-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 onsite will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing onsite 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 onsite.

Sampling and analysis of excavated backfill to qualify for unrestricted or restricted residential uses for onsite reuse will be performed in accordance with the Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) for the Site (Appendix F of the SMP). Representative sampling will be in accordance with DER-10.

E-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 offsite, unless prior approval is obtained from the 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. Liquids discharged into the New York City (NYC) sewer system will be addressed through approval by the New York City Department of Environmental Protection (NYCDEP), as necessary.

E-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the Site Cover System will be restored in a manner that complies with the Remedial Action Work Plan (RAWP). The existing Site Cover System for the majority of the Site is comprised of building foundations. The remainder of the Site currently contains a Site Cover System that is comprised of 2 feet of stone overlying a demarcation layer or a minimum of 3-inches of asphalt overlaying a minimum of 4-inches of existing asphalt/subbase. The demarcation layer, consisting of orange snow fencing material or approved equivalent, 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 PRR and in an updated SMP.

E-10 BACKFILL FROM OFFSITE SOURCES

All materials proposed for import onto the Site will be approved by the qualified environmental professional, as defined in 6 NYCRR Part 375, and will be in compliance with 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 G of this SMP.

Material from industrial sites, spill sites, or 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. Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table 2. 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.

A pre-determined Beneficial Use Determination (BUD) may be applicable for use of recycled concrete aggregate (RCA) with less than 10 percent passing a number 80 sieve sourced from a NYSDEC registered C&D Debris processing facility. A Site-specific BUD may be requested under certain circumstances for soil from environmental remediation sites or other sources.

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.

E-11 STORMWATER POLLUTION PREVENTION

Erosion and sediment controls to be installed during future disturbance of residual contamination, if required, will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. As required, silt fence, barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by 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.

E-12 EXCAVATION CONTINGENCY PLAN

During the remedial action (RA), a total of seventeen underground storage tanks (USTs) were uncovered and properly cleaned and disposed of offsite by a licensed tank contractor and it is unlikely that there are others present due to the extensive work completed onsite.

In the unlikely event that additional USTs 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 organic compounds [VOCs] and semivolatile organic compounds [SVOCs] (including 1,4 dioxane), TCL pesticides, polychlorinated biphenyls [PCBs], and PFAS), unless the Site history and previous sampling results provide a sufficient

justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC 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 to NYSDEC's project manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will also be included in the PRR.

E-13 COMMUNITY AIR MONITORING PLAN (CAMP)

The CAMP is included within the HASP, which is located in Appendix E of this SMP. The location of air sampling stations will be based on generally prevailing wind conditions at the Site. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and a downwind monitoring station.

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

E-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors offsite and onsite. Specific odor control methods to be used on a routine basis will include the use of odor suppressants and controlled excavation procedures as discussed below. 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 RP's Remediation Engineer, and any measures that are implemented will be discussed in the PRR.

All necessary means will be employed to prevent onsite and offsite 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 offsite 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 onsite 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.

E-15 DUST CONTROL PLAN

Particulate monitoring must be conducted according to the Community Air Monitoring Plan (CAMP) provided in Section E-13. 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 onsite work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated onsite water truck for road wetting. The truck 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.
- Onsite roads will be limited in total area to minimize the area required for water truck sprinkling.

E-16 OTHER NUISANCES

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

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

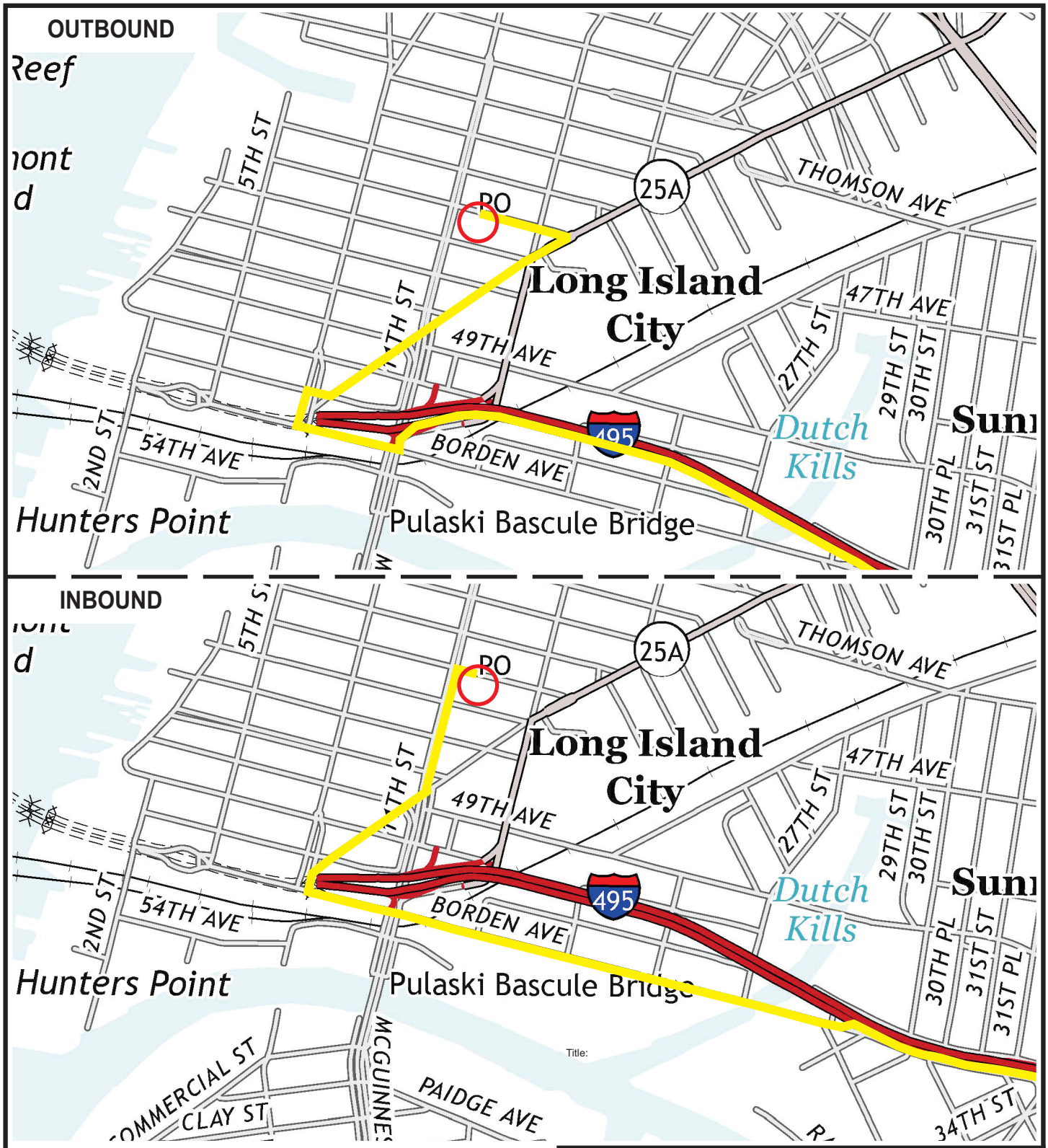
Table 1. Restricted Residential and Protection of Groundwater Soil Cleanup Objectives

Parameter	Restricted Residential Soil Cleanup Objectives	Protection of Groundwater Soil Cleanup Objectives
Volatile Organic Compounds (Concentrations in mg/kg)		
1,1,1-Trichloroethane	100	0.68
1,1-Dichloroethane	26	0.27
1,1-Dichloroethene	100	0.33
1,2,4-Trimethylbenzene	52	3.6
1,3,5-Trimethylbenzene	52	8.4
1,2-Dichlorobenzene	100	1.1
1,2-Dichloroethane	3.1	0.02
1,3-Dichlorobenzene	49	2.4
1,4-Dichlorobenzene	13	1.8
1,4-Dioxane	13	0.1
2-Butanone (MEK)	100	0.12
Acetone	100	0.05
Benzene	4.8	0.06
n-Butylbenzene	100	12
Carbon tetrachloride	2.4	0.76
Chlorobenzene	100	1.1
Chloroform	49	0.37
cis-1,2-Dichloroethene	100	0.25
Ethylbenzene	41	1
Hexachlorobenzene	1.2	3.2
Methylene chloride	100	0.05
Methyl tert-butyl ether (MTBE)	100	0.93
n-Propylbenzene	100	3.9
sec-Butylbenzene	100	11
tert-Butylbenzene	100	5.9
Tetrachloroethene	19	1.3
Toluene	100	0.7
trans-1,2-Dichloroethene	100	0.19
Trichloroethene	21	0.47
Vinyl chloride	0.9	0.02
Xylenes (mixed)	100	1.6
Semivolatile Organic Compounds (Concentrations in mg/kg)		
Acenaphthene	100	98
Acenaphthylene	100	107
Anthracene	100	1000
Benzo[a]anthracene	1	1
Benzo[a]pyrene	1	22
Benzo[b]fluoranthene	1	1.7
Benzo[g,h,i]perylene	100	1000
Benzo[k]fluoranthene	3.9	1.7
Chrysene	3.9	1
Dibenzo[a,h]anthracene	0.33	1000
Fluoranthene	100	1000
Fluorene	100	386
Indeno[1,2,3-cd]pyrene	0.5	8.2
m-Cresol	100	0.33
Naphthalene	100	12
o-Cresol	100	0.33
p-Cresol	100	0.33
Pentachlorophenol	6.7	0.8
Phenanthrene	100	1000
Phenol	100	0.33
Pyrene	100	1000

Table 1. Restricted Residential and Protection of Groundwater Soil Cleanup Objectives

Parameter	Restricted Residential Soil Cleanup Objectives	Protection of Groundwater Soil Cleanup Objectives
Metals (Concentrations in mg/kg)		
Arsenic	16	16
Barium	400	820
Beryllium	72	47
Cadmium	4.3	7.5
Chromium, Hexavalent	110	19
Chromium, Trivalent	180	NS
Copper	270	1720
Total Cyanide	27	40
Lead	400	450
Manganese	2000	2000
Mercury	0.81	0.73
Nickel	310	130
Selenium	180	4
Silver	180	8.3
Zinc	10000	2480
Pesticides (Concentrations in mg/kg)		
2,4,5-TP Acid (Silvex)	100	3.8
4,4'-DDD	13	14
4,4'-DDE	8.9	17
4,4'-DDT	7.9	136
Aldrin	0.097	0.19
alpha-BHC	0.48	0.02
alpha-Chlordane	4.2	2.9
beta-BHC	0.36	0.09
delta-BHC	100	0.25
Dibenzofuran	59	210
Dieldrin	0.2	0.1
Endosulfan I	24	102
Endosulfan II	24	102
Endosulfan sulfate	24	1000
Endrin	11	0.06
gamma-BHC (Lindane)	1.3	0.1
Heptachlor	2.1	0.38
Total Polychlorinated Biphenyls (Concentrations in mg/kg)		
Total Polychlorinated Biphenyls	1	3.2

mg/kg - Milligrams per kilogram
NS - Not Specified



TRUCK ROUTE

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H	Date: 19OCT21	FIGURE
Prepared by: G.M.	Scale AS SHOWN	D-1
Project Mgr: R.L.	Project: 3371.0001Y000	
File: 3371.0001Y141.06.CDR		

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APPENDIX E

Health and Safety Plan

Site-Specific Health and Safety Plan

11-20 46th Road
Long Island City, New York

June 10, 2020

Prepared for:

11-20 46th Road Owner LLC
10 East 34th Street, Mezzanine
New York, New York 10016

Prepared by:

Roux Environmental Engineering and Geology, D.P.C.
209 Shafter Street
Islandia, New York 11749

3371.0001Y109/CV

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Table of Contents

Table of Contents (Continued)

Tables

Figures

Appendices

Site-Specific Emergency Information

Emergency Phone Numbers

Most emergency services can be obtained by calling **911**. Where 911 service is not available, use the telephone numbers provided in the below table. The following is a master emergency phone list for use by the project management personnel. A more condensed version of the emergency numbers listed below will be posted throughout project work areas. Emergencies encountered on the site will be responded to by a combination of off-site emergency services and site personnel.

Emergency Contact Information			
Site Personnel			
Title	**Contact**		**Telephone**
Project Manager (PM)	Rachel Henke		(919) 619-1503
Site Supervisor (SS)	TBD		
Site Health and Site Safety Officer (SHSO)	TBD		
Office Health and Safety Manager (OHSM)	Kristina DeLuca		(631) 630-2406
Corporate Health and Safety Manager (CHSM)	Brian Hobbs		(631) 630-2419
Client Emergency Contact	TBD		
Outside Assistance			
Agency	**Contact**	**Telephone**	**Address/Location**
Ambulance/emergency medical services (EMS)	Forest Urgent Care	(718) 268-6808 / 911	112-01 75th Avenue, Forest Hills, NY 11375
Police	94th Precinct	(718) 383-3879 / 911	100 Meserole Avenue, Brooklyn, NY 11222
Fire	New York City Fire Department	(718) 999-2000 / 911	10-40 47th Avenue, Long Island City, NY 11101
Site Address	11-20 46th Rd, Long Island City, New York		

Route to NYU Medical Center:

403 E 34th Street, New York, NY

- Get on I-495W from 11th Street, Jackson Avenue and 50th Avenue
- Take Queens Midtown tunnel to E 35th Street in Manhattan
- Take the exit toward downtown from I-495W
- Drive to E 34th Street

Route to Forest Urgent Care:

10-11 49th Avenue, Long Island City, New York

- Head west on 47th Avenue
- Turn left onto Vernon Boulevard
- Turn left onto 49th Avenue
- 149th Street and the destination will be ahead on the right.

1. Introduction

This Site-specific Health and Safety Plan (HASP) has been prepared by Roux Environmental Engineering and Geology, D.P.C. (Roux) for use during the SSDS installation oversight and sampling at 11-20 46th Road LLC ("the Site"), located at 11-20 46th Road, Long Island City, NY 11101 (see **Figure 1**). These activities fall within the scope of operations covered by the Occupational Safety and Health Administration (OSHA) standards promulgated at 29 CFR 1910.120 and 29 CFR 1926.65, both commonly referred to as the Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard. In accordance with the HAZWOPER Standard, this site-specific HASP was prepared to address the safety and health hazards associated with the drilling, and environmental sampling activities being performed at the Site by Roux and to provide requirements and procedures for the protection of Roux employees, subcontractor personnel, government oversight personnel, Site personnel, and the general public. It also addresses client- and Site-specific requirements for health and safety.

Implementation of this HASP is the joint responsibilities of the project manager, the site health and safety officer, and all field staff, with assistance from the project principal and the office health and safety manager. The project manager for this project is Jessica Lam; the site health and safety officer and the site supervisor will be determined prior to the start of the project.

1.1 Roles and Responsibilities

Overall Roles and Responsibilities (R&Rs) of Roux personnel are provided in Roux's Policies and Procedures Manual. Only those R&Rs specific to HASP requirements are listed below.

Project Manager (PM)

The PM has responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the Site Health and Safety Officer (SHSO), has the authority to oversee and monitor the performance of the SHSO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

- Preparing and coordinating the site work plan;
- Providing site supervisor(s) with work assignments and overseeing their performance; Coordinating safety and health efforts with the SSHO;
- Ensuring effective emergency response through coordination with the Emergency Response Coordinator (ERC); and
- Serving as primary site liaison with public agencies, officials, and site contractors.

Site Health and Safety Officer (SHSO)

The SHSO has full responsibility and authority to develop and implement this HASP and to verify compliance. The SHSO reports to the Project Manager. The SHSO is on site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SHSO include:

- Managing the safety and health functions on this site;
- Serving as the site's point of contact for safety and health matters;
- Ensuring site monitoring, worker training, and effective selection and use of PPE;

- Assessing site conditions for unsafe acts and conditions and providing corrective action;
- Assisting the preparation and review of this hasp;
- Maintaining effective safety and health records as described in this HASP; and
- Coordinating with the site Supervisor(s) and others as necessary for safety and health efforts.

Site Supervisor

The Site Supervisor is responsible for field operations and reports to the Project Manager (PM). The Site Supervisor ensures the implementation of the HASP requirements and procedures in the field. The specific responsibilities of the Site Supervisor include:

- Executing the work plan and schedule as detailed by the PM;
- Coordination with the SHSO on safety and health; and
- Ensuring site work compliance with the requirements of this HASP.

Site Workers

Site workers are responsible for complying with this HASP, using the proper PPE, reporting unsafe acts and conditions, and following the work and safety and health instructions of the Project Manager (PM), SHSO, and Site Supervisor.

2. Background

Relevant background information is provided below, including a general description of the Site; a brief review of the Site's history with respect to hazardous material use, handling, and/or storage; and a review of known and potential releases of hazardous substances at the Site.

2.1 Site Description

The Site is located on the south side of 46th Road, between 11th Street to the west and 21st Street to the east, in the borough of Queens, New York. The borough of Queens is situated in the east portion of New York City. The vicinity of the Subject Property consists of commercial, residential, warehouses and factories. The ground surfaces in the vicinity of the Site consist of asphalt and concrete. The Site is located in an urban setting, so it is important that all personnel on site are aware of hazards that may arise in a densely populated setting, such as traffic hazards.

The properties situated adjacent to the Site include the NYSDEC Region 2 office to the north, a 4-story residential building to the south, a 1-story vacant commercial building to the east, and a 1-story warehouse to the west.

2.2 Site History

According to historical Sanborn maps, the site was undeveloped until 1950. A loft building was constructed in 1957 and used as commercial space, manufacturing, and warehouses. Based on a review of available information provided and/or obtained for 11-20 46th Rd in a 2008 Phase I report, it appears that the Site was developed with the existing building in 1957. The building was used for various manufacturing and commercial companies. The 1967-2008 City Directory lists the occupants as "W&W Jewelers and Zenith Graphics Supply." Jewelry and graphics manufacturing and operations commonly involve the use of hazardous materials and heavy metals throughout the entire process. These potential constituents should be considered when performing activities on site.

2.3 Known and Potential Releases of Hazardous Substances at the Site

The only documented release on site occurred in April 2007, when No. 2 fuel oil spilled in a sump. The spill was closed in 2007.

3. Scope of Work

In general, the tasks will include the oversight of the installation of an sub-slab depressurization system and the installation of sub-slab vapor monitoring points, sampling of sub-slab monitoring points, and collection of indoor air samples.

4. Site Control

This site control program is designed to reduce the spread of hazardous substances from contaminated areas to clean areas, to identify and isolate contaminated areas of the site, to facilitate emergency evacuation and medical care, to prevent unauthorized entry to the site, and to deter vandalism and theft.

4.1 Site Map

A map of this site, showing site boundaries, designated work zones, and points of entry and exit is provided in Figure1.

4.2 Site Access

Access to the site is restricted to reduce the potential for exposure to its safety and health hazards. During hours of site operation, site entry and exit is authorized only at the points. Entry and exit at these points are controlled by roll-up garage doors and entrances to the building.

4.3 Buddy System

While working in the Exclusion Zone, site workers use the buddy system. The buddy system means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of an emergency. The responsibilities of workers using the buddy system include:

- Remaining in close visual contact with partner;
- Providing partner with assistance as needed or requested;
- Observing partner for signs of heat stress or other difficulties;
- Periodically checking the integrity of partner's PPE; and
- Notifying the site manager or other site personnel if emergency assistance is needed.

4.4 Site Communications

The following communication equipment is used to support on-site communication: telephones.

- Cellular telephones will be available for communication with emergency support services/facilities. Each field person is equipped with a cellular telephone and is available for communication with emergency support services. A current list of emergency contact numbers is published and posted on-site.

4.5 Site Work Zones

This site is divided into three (3) major zones, described below. These zones are characterized by presence or absence of biological and chemical hazards and the activities performed within them. Zone boundaries are clearly marked at all times and the flow of personnel among the zones is controlled. The site is monitored for changing conditions that may warrant adjustment of zone boundaries. Zone boundaries are adjusted as necessary to protect personnel and clean areas. Whenever boundaries are adjusted, zone markings are also changed and workers are immediately notified of the change. The Heavy Equipment Exclusion Zone Policy is attached in Appendix D.

Exclusion Zone

The area where contamination exists is the Exclusion Zone (EZ). All areas where excavation and handling of contaminated materials take place are considered the EZ. This zone will be clearly delineated by orange high visibility fencing. Safety tape may be used as a secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The SHSO may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Personnel are not allowed in the EZ without:

- A buddy (co-worker);
- Required minimum level PPE;
- Medical Authorization;
- Training certification; and
- Requirement to be in the zone.

Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) is established between the exclusion zone and the support zone. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of personnel and equipment. The CRZ will be used for general Site entry and egress in addition to access for heavy equipment and emergency support services. Personnel are not allowed in the CRZ without:

- A buddy (co-worker)
- Appropriate PPE
- Medical authorization
- Training certification
- Requirement to be in the zone

Support Zone

The Support Zone (SZ) is an uncontaminated area that will be the field support area for the Site 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 or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

5. Job Hazard Evaluation

Roux's work at the Site is expected to entail a variety of physical, chemical, and biological hazards, all of which must be sufficiently managed to allow the work to be performed safely. Some of the hazards are Site-specific (i.e., they are associated with the nature, physical characteristics, and/or routine operation of the Site itself) while others are activity-specific (i.e., they are associated with [or arise from] the particular activity being performed). The various hazards can be grouped into the following categories:

Caught/Crushed – the potential to become caught in, under, between, or by an object or parts of an object, such as equipment with parts that open and close or move up and down ("pinch points") or equipment that rotates, and the accompanying potential to have body parts cut, mangled, or crushed thereby.

Contact – the potential to be struck by or against moving or stationary objects that can cause physical injury, such as heavy machinery, overhead piping, moving vehicles, falling objects, and equipment (including tools and hand-held equipment) or infrastructure with the ability to cut or impale.

Energy Sources – the potential for bodily harm associated with energy sources, most notably electricity, but also including latent energy sources such as compressed air and equipment under tension (which when released could cause injurious contact or a fall).

Ergonomics – the potential for musculoskeletal injury associated with lifting/carrying, pushing/pulling, bending, reaching, and other physical activity attributable to poor body position/mechanics, repetitive motion, and/or vibration.

Exposure – the potential for injury/illness due to physical, chemical, or biological exposures in the work environment, including but not limited to temperature extremes, solar radiation, and noise (physical), chemical splashes and hazardous atmospheres (chemical), and animal/insect bites and poisonous plants (biological).

Falls – the potential to slip or trip and thus fall or drop a load, resulting in bodily injury to oneself or others

The foregoing is intended to provide Roux employees with a general awareness of the hazards involved with Site work. A more detailed review of the potential hazards associated with each specific activity planned for the Site (or on-going activity, as the case may be) is provided in the activity-specific Job Safety Analysis (JSA) forms in Appendix A. As can be seen in the JSA forms, the hazards are identified by category per the above, and specific measures designed to mitigate/manage those hazards are also identified. In preparing the JSA forms, all categories of hazards were considered, and all anticipated potential hazards were identified to the extent possible based on the experience of the personnel preparing and reviewing the JSA forms. However, there is always the possibility for an unanticipated hazard to arise, potentially as condition change over the course of the workday. Roux personnel must maintain a continual awareness of potential hazards in the work zone, regardless of whether the hazard is identified in the JSA form. Particular attention should be paid to hazards associated with exposure to hazardous substances (see Table 1 for a listing of the hazardous substances most likely to be encountered in environmental media at the Site) and to Site personnel being located "in the line of fire" with respect to moving equipment, pinch points, and latent energy (e.g., being located or having body parts located within the swing radius of an excavator, between two sections of pipe being connected, below a piece of suspended equipment, or adjacent to a compressed air line).

5.1 Employee Notification of Hazards and Overall Site Information Program

The information in the JSAs and safety data sheets is made available to all employees and subcontractors who could be affected by it prior to the time they begin their work activities. Modifications to JSAs are communicated during routine pre-work briefings.

6. Emergency Response Plan

This emergency response plan details actions to be taken in the event of site emergencies. The PM and SHSO is responsible for the implementation of emergency response procedures on-Site. The SHSO/PM provides specific direction for emergency action based upon information available regarding the incident and response capabilities and initiates emergency procedures and notification of appropriate authorities. In the event of an emergency, site personnel are evacuated and do not participate in emergency response activities, response is facilitated through external emergency services.

6.1 Emergency Response

The SHSO, after investigating the incident and relevant information, shall determine the level of response required for containment, rescue, and medical care. Limited on-Site emergency response activities could occur; therefore, the SHSO is responsible for notifying external emergency response agencies. The SHSO provides relevant information to the responding organizations, including but not limited to the hazards associated with the emergency incident, potential containment problems, and missing site personnel.

6.2 Emergency Alerting and Evacuation

If evacuation notice is given, site workers leave the worksite, if possible, by way of the nearest exit. Appropriate primary and alternate evacuation routes and assembly areas have been identified. The routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by SHSO/PM.

Personnel exiting the site gather at a designated assembly point. To determine that everyone has successfully exited the site, personnel will be accounted for at the assembly site. If any worker cannot be accounted for, notification is given so that appropriate action can be initiated. Subcontractors on this site have coordinated their emergency response plans to ensure that these plans are compatible and potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

6.3 Emergency Medical Treatment and First Aid

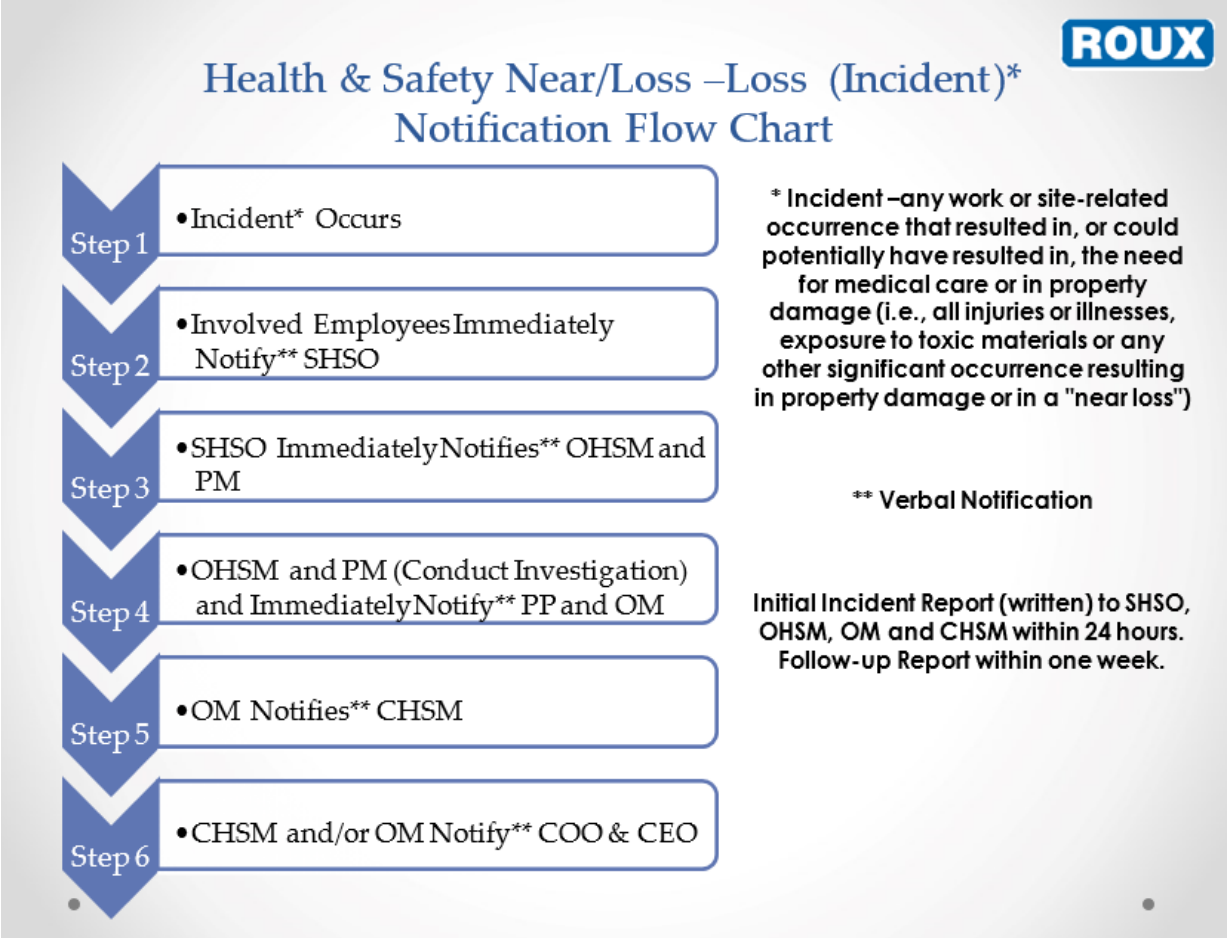
In the event of a work-related injury or illness, employees are required to follow procedures outlined below. All work-place injury and illness situations require Roux's Project and Corporate Management Team to be notified when an injury / illness incident occurs, and communication with the contracted Occupational Health Care Management Provider, AllOne Health, is initiated. The Injury/Illness Notification Flowchart is provided below and within Roux's Incident Investigation and Reporting program included as Appendix C.

If on-Site personnel require any medical treatment, the following steps will be taken:

1. Notify Roux's Project and Corporate Management Team for any work-related injury and/or illness occurrence, and communicate with the contracted Occupational Health Care Management Provider, AllOne Health, immediately following the notifications provided above.
2. Based on discussions with the Project Team, Corporate Management, and the AOH evaluation, if medical attention beyond on-Site First Aid is warranted, transport the injured / ill person (IP) to the Urgent Care Center, or notify the Fire Department or Ambulance Emergency service and request an ambulance or transport the victim to the hospital, and continue communications with Corporate

Management Team. A Hospital Route and Urgent Care map with location to New York Presbyterian Hospital/ CityMD is included in Figures 2 and 3.

3. Decontaminate to the extent possible prior to administration of first aid or movement to medical or emergency facilities.
4. First aid medical support will be provided by onsite personnel trained and certified in First Aid, Cardio Pulmonary Resuscitation (CPR), Automatic External Defibrillation (AED), and Blood-Borne Pathogens (BBP) Awareness, until relieved by emergency medical services (EMS).
5. The SHSO and Project Manager will perform a Loss Investigation (LI) and the Project Team will complete the final Loss Report. If a Roux employee is involved in a vehicular incident, the employee must also complete the Acord Automobile Loss Notice.



6.4 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO or project principal will determine if work can continue without sacrificing the health and safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.
- Treacherous weather-related conditions.
- Limited visibility.

- Electrical storm potential.

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions include heavy rain, fog, high winds, and lightning. Observe daily weather reports and evacuate if necessary in case of inclement weather conditions.

6.5 Electrical Storm Guidelines

In the event that lightning and/or thunder are observed while working on-Site, all on-Site activities shall stop and personnel shall seek proper shelter (e.g., substantial building, enclosed vehicle, etc.). Work shall not resume until the threat of lighting has subsided and no lightning or thunder has been observed for 30 minutes. If the possibility of lightning is forecasted for the day, advise the on-Site personnel on the risks and proper procedure at the pre-work safety briefing. Continuously monitor for changing weather conditions and allow enough time to properly stop work if lightning is forecast.

7. Safety Procedures

This section of the HASP presents the specific safety procedures to be implemented during Roux's activities at the Site in order to protect the health and safety of various on-site personnel. Minimum OSHA-mandated procedures are presented first, followed by client- and Site-specific procedures. Lastly, activity-specific procedures are discussed. These Site- and activity-specific procedures supplement the general safety procedures included in Roux's Corporate Health and Safety Manual, which also must be followed in their entirely.

7.1 Training

At a minimum, Site personnel who will perform work in areas where there exists the potential for toxic exposure will be health and safety-trained prior to performing work on the Site per OSHA 29 CFR 1910.120(e) and 29 CFR 1926.65(e). More specifically, all Roux, subcontractor, and other personnel engaged in sampling and remedial activities at the Site and who are exposed or potentially exposed to hazardous substances, health hazards, or safety hazards must have received at a minimum the 40 hour initial HAZWOPER training consistent with the requirements of 29CFR 1910.120(e)(3)(i) training and a minimum of 3 days' actual field experience under the direct supervision of a trained experienced supervisor, plus 8 hours of refresher training on an annual basis. Depending on tasks performed, less training may be permitted. Evidence of such training must be maintained at the Site at all times. Furthermore, all on-Site management and supervisory personnel directly responsible for or who supervise the employees engaged in Site remedial operations, must have received an additional 8 hours of specialized training at the time of job assignment on topics including, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques, plus 8 hours of refresher training on an annual basis.

Roux personnel training records are maintained in a corporate database with records available upon request from either the OHSM/SHSO/CHSM or Human Resources Department.

7.2 Site-Specific Safety Briefings for Visitors

A Site-specific briefing is provided to all site visitors who enter this site beyond the site entry point. For visitors, the Site-specific briefing provides information about site hazards; the site lay-out, including work zones and places of refuge; the emergency alarm system and emergency evacuation procedures; and other pertinent safety and health requirements as appropriate.

7.3 HASP Information and Site-Specific Briefings for Workers

Site personnel review this HASP and are provided a Site-specific tailgate briefing prior to the commencement of work to ensure that employees are familiar with this HASP and the information and requirements it contains as well as relevant JSAs. Additional briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing site characterization and analysis. Conditions for which we schedule additional briefings include, but are not limited to: changes in site conditions, changes in the work schedule/plan, newly discovered hazards, and incidents occurring during site work.

7.4 Medical Surveillance

The medical surveillance section of the Health and Safety Plan describes how worker health status is monitored at this site. Medical surveillance is used when there is the potential for worker exposure to

hazardous substance at levels above OSHA permissible exposure limits or other published limits. The purpose of a medical surveillance program is to medically monitor worker health to ensure that personnel are not adversely affected by site hazards.

7.4.1 Site Medical Surveillance Program

Medical surveillance requirements are based on a worker's potential for exposure as determined by the site characterization and job hazard analysis documented in Section 4 and JSAs within Appendix A of this HASP and in compliance with the requirements of 29 CFR 1910.120(f)(2). Based on site information and use of direct reading instruments, limited use of respirators (less than 30 days per year), and the absence of an employee-staffed HAZMAT team, a limited medical surveillance program is required and implemented at this site. The medical surveillance program provides that:

1. Workers assigned to tasks requiring the use of respirators receive medical examinations in accordance with 29 CFR 1910.134(e) to ensure they are physically capable to perform the work and use the equipment.
2. If a worker is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substance or health hazards, medical examinations are provided to that worker as soon as possible after the occurrence and as required by the attending physician.
3. These medical examinations and procedures are performed by or under the supervision of a licensed physician and are provided to workers free of cost, without loss of pay, and at a reasonable time and place. In addition, the need to implement a more comprehensive medical surveillance program will be re-evaluated after any apparent over-exposure.

7.4.2 Medical Recordkeeping Procedures

Medical recordkeeping procedures are consistent with the requirements of 29 CFR 1910.1020 and are described in the company's overall safety and health program. A copy of that program is available at our Islandia, New York office.

The following items are maintained in worker medical records:

- Respirator fit test and selection;
- Physician's medical opinion of fitness for duty (pre-placement, periodic, termination);
- Physician's medical opinion of fitness for respirator protection (pre-placement, periodic); and
- Exposure monitoring results.

7.4.3 Program Review

The medical program is reviewed to ensure its effectiveness. The Corporate Health and Safety Manager, in coordination with the Human Resources Director, is responsible for this review. At minimum, this review consists of:

- Review of accident and injury records and medical records to determine whether the causes of accidents and illness were promptly investigated and whether corrective measures were taken wherever possible;
- Evaluation of the appropriateness of required medical tests based on site exposures; and
- Review of emergency treatment procedures and emergency contacts list to ensure they were site-specific, effective, and current.

7.5 Personnel Protection

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices and PPE are used to protect employees. Appropriate personal protective equipment (PPE) shall be worn by Site personnel when there is a potential exposure to chemical hazards or physical hazards (e.g., falling objects, flying particles, sharp edges, electricity, and noise [Appendix B]), as determined by the SHSO, and described in the Personal Protective Equipment Program attached as Appendix F. The level of personal protection, type, and kind of equipment selected will depend on the hazardous conditions and in some cases cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors will be made before work can be safely executed.

Roux maintains a comprehensive written PPE program that addresses proper PPE selection, use, maintenance, storage, fit, and inspection. PPE to be used at the Site will meet the appropriate American National Standards Institute (ANSI) standards and the following OSHA (General Industry) standards for minimum PPE requirements.

The minimum level of PPE for entry onto the Site is Level D. The following equipment shall be worn:

- Work uniform (long pants, sleeved shirt);
- Hard hat;
- Steel or composite toe work boots;
- Safety Glasses (must comply with one of the following ANSI/ISEA Z87.1-2010, ANSI Z87.1-2003, ANSI Z87.1-2003);
- Boot Covers (as needed);
- Hearing Protection (as needed);
- High visibility clothing (shirt/vest); and
- Hand Protection (e.g., minimum cut resistance meeting ANSI 105-2000 Level 2).

Note that jewelry shall be removed or appropriately secured to prevent it from becoming caught in rotating equipment or unexpectedly snagged on a fixed object. (e.g., wrist watches, bracelets, rings, chains and necklaces, open earrings). Do not wear loose clothing and all shoulder length hair should be tied back.

Site specific PPE ensembles and materials are identified within task specific JSAs located within Appendix A, and any upgrades or downgrades of the level of protection (i.e., not specified in the JSA) must be immediately communicated to all Roux personnel and subcontractors as applicable. PPE is used in accordance with manufacturer's recommendations.

7.6 Monitoring

An air monitoring program is important to the safety of on- and off-Site personnel. A preliminary survey, to establish background conditions in the immediate sampling area, may be made prior to the initiation of Site work including, but not limited to, monitoring wind direction and approximate temperature during all invasive site activities. This survey will be conducted with the appropriate air monitoring instrument(s) as warranted by the field activity. Once this survey has been complete, any change in the type of PPE will be determined.

Air monitoring may be performed to verify that the proper level of equipment is used and to determine if increased protection or work stoppage is required. The following equipment may be used to monitor conditions:

- A Photoionization Detector (PID) with a lamp energy of 10.6 eV will be used to provide direct readings of organic vapor concentrations during intrusive activities to determine that personnel protection is adequate. Concentrations shall be recorded during intrusive activities with the potential to encounter contaminant vapors.

Monitoring equipment will be calibrated in accordance with applicable regulatory requirements and manufacturer specifications.

Below are monitoring action levels for Site-specific chemicals of concern. In the event that PID readings above the thresholds identified below are sustained for 5 minutes in the breathing zone, worker protection will require upgrading following notification to the OHSM and applicable parties (e.g., client, board of health, regulators, etc.).

OVM/Multi-gas Meter Action Levels

Action Levels for Respiratory Protection	
OVM Reading in Breathing Zone (ppm)	
<5	No Action
≥5 - <25	Level C
≥25	Cease Field Operations
Multi-gas Reading in Breathing Zone (%)	
LEL ≥2	Cease Field Operations
O_2 <19.5 or >21.5	Cease Field Operations

7.7 Tailgate Safety Meetings

A designated Site worker will provide daily safety briefings (e.g., tailgate meetings) including, but not limited to, the following scenarios:

- When new operations are to be conducted;
- Whenever changes in work practices must be implemented; and
- When new conditions are identified and/or information becomes available.

Daily safety briefings shall be recorded on the Roux Daily Tailgate Health and Safety Meeting Log/Daily Site Safety Checklist, and all completed forms will become a part of the project file.

7.8 Spill Containment

Spill containment equipment and procedures should, at a minimum, meet the requirements of the facility's Spill Prevention, Control and Countermeasure Plan, if applicable. Otherwise, spill containment equipment and procedures must be considered depending on the task including, but no limited to, chemical/product transfer points and handling.

7.8.1 Initial Spill Notification and Response

Any worker who discovers a hazardous substance spill will immediately notify the Project Manager, Rachel Henke. The worker will, to his/her best ability, report the hazardous substance involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, and any associated injuries without compromising their own safety.

7.8.2 Spill Evaluation and Response

Rachel Henke, Project Scientist, is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area will be isolated and demarcated to the extent possible. If necessary to protect nearby community members, notification of the appropriate authorities is made by the PM as appropriate. On-site response is limited to small spills (e.g., <10 gallons), large spills require external emergency responders who will be contacted by the SHSO.

7.10 Decontamination

The decontamination section of the HASP describes how personnel and equipment are decontaminated when they leave the Exclusion Zone. This section also describes how residual waste from decontamination processes is disposed. The site decontamination procedures are designed to achieve an orderly, controlled removal or neutralization of contaminants that may accumulate on personnel or equipment. These procedures minimize worker contact with contaminants and protect against the transfer of contaminants to clean areas of the site and off-site. They also extend the useful life of PPE by reducing the amount of time that contaminants contact and can permeate PPE surfaces. Decontamination is facilitated within the contamination reduction zone at this site.

7.10.1 Decontamination Procedures for Personnel and PPE

The following are general decontamination procedures established and implemented at this site.

1. Decontamination is required for all workers exiting a contaminated area. Personnel may re-enter the Support Zone only after undergoing the decontamination procedures described below in the next section.
2. Protective clothing is decontaminated, cleaned, laundered, maintained, and/or replaced as needed to ensure its effectiveness.
3. PPE used at this site that requires maintenance or parts replacement is decontaminated prior to repairs or
4. PPE used at this site is decontaminated or prepared for disposal on the premises. Personnel who handle contaminated equipment have been trained in the proper means to do so to avoid hazardous exposure.
5. This site uses an off-site laundry for decontamination of PPE. The site has informed that facility of the hazards associated with contaminated PPE from this site.
6. The site requires and trains workers that if their permeable clothing is splashed or becomes wetted with a hazardous substance, they will immediately exit the work zone, perform applicable decontamination procedures, shower, and change into uncontaminated clothing.
7. Procedures for disposal of decontamination waste meet applicable local, State, and Federal regulations.

7.10.2 Decontamination Procedures for Equipment

All tools, equipment, and machinery from the Exclusion Zone or CRZ are decontaminated in the CRZ prior to removal to the Support Zone. Equipment decontamination procedures are designed to minimize the potential for hazardous skin or inhalation exposure and to avoid cross-contamination and chemical incompatibilities.

General Equipment Decontamination Procedures:

1. Decontamination is required for all equipment exiting a contaminated area. Equipment may re-enter the Support Zone only after undergoing the equipment decontamination procedures.
2. Vehicles that travel regularly between the contaminated and clean areas of the site are carefully decontaminated each time they exit the Exclusion Zone and the effectiveness of that decontamination is monitored to reduce the likelihood that contamination will be spread to other parts of the site.
3. Particular attention is given to decontaminating tires, scoops, and other parts of heavy equipment that are directly exposed to contaminants and contaminated soil.

The following items may be used to decontaminate equipment:

- Fresh water rinse;
- Non-phosphorus detergent wash;
- Distilled water rinse;
- Acetone rinse;
- Distilled water rinse; and
- A steam cleaner or pressure washer (heavy equipment only).

7.10.3 Monitoring the Effectiveness of Decontamination Procedures

Visual examination and sampling are used to evaluate the effectiveness of decontamination procedures. Visual examination is used to ensure that procedures are implemented as described and that they appear to control the spread of contaminants under changing site conditions. Visual examination is also used to inspect for signs of residual contamination or for contaminant permeation of PPE.

Personnel who work in contaminated areas of the site, either the Contamination Reduction Zone (CRZ) or the Exclusion Zone, are trained in the principles and practices of decontamination described in this section of the HASP and in related SOPs. If site procedures are changed as a result of inspection and monitoring, all affected employees are notified of these changes.

7.11 Confined Space Entry

The following is a list of the safety requirements for confined space entry at the Site:

- **ROUX PERSONNEL ARE NOT AUTHORIZED TO ENTER AN OSHA PERMIT REQUIRED CONFINED SPACE;**
- Currently the scope of work **DOES NOT** require personnel to enter permitted confined space for this project; and
- Any changes to the field activities that may necessitate confined space entry will be reported to the Project Principal and OHSM.

Confined space is defined as any space, depression, or enclosure that:

- Has limited opening for entry and egress;
- Is large enough for and employee to enter and perform assigned work; and
- Is not intended for continuous occupancy.

A permit required confined space is one that meets the definition of a confined space and has one or more of the following characteristics:

- May contain or produce life-threatening atmospheres due to oxygen deficiency the presence of toxic, flammable, or corrosive contaminants;
- Contains a material that has the potential for engulfment;
- Has an internal configuration that may cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; and
- Contains any other serious safety or health hazards.

Although Roux personnel will not perform confined space entry, it is expected that subcontractors performing cleaning and mitigation and/or remedial measures activities may be required to enter structures that are considered to be a permit required confined space. Permitting of the confined space as well as hazard mitigation for entry will be completed by the subcontractor in accordance with 1910.146.

7.12 Client and Site-Specific

In addition to the OSHA-specific procedures discussed above, there may be client and site-specific safety procedures that must be adhered to during the performance of remedial activities at the Site.

7.13 Unusual or Significant Risks

Field activities that appear to have unusual or significant risks that cannot be adequately managed with existing risk tools such as LPS, HASPs, traffic safety plans, work permits, design and O&M practices, equipment HAZOPS or other safety tools must be referred to the CHSM to help with the assessment and management of the associated potential safety risks. Examples include the use of explosives for demolition, use of firearms to control wildlife, rappelling, demolition over water, etc.

7.14 Activity-Specific

In addition to the general hazards discussed above, there are activity-specific hazards associated with each work activity planned for the Site. An activity-specific JSA has been completed for each of the activities planned for the Site. JSAs are provided in Appendix A. In the event that new work activities or tasks are planned, JSAs will be developed and implemented prior to performing the new activities. In the absence of a JSA, the personnel performing work must prepare a field JSA and receive clearance from a designated competent safety official prior to performing any task with significant risk. In emergency situations where time is critical SPSAs will be utilized to identify the task, associated hazards and mitigative actions to take. For lower risk activities (as deemed by the discretion of a Competent Person) where a JSA is determined to not be needed, the individual(s) conducting the activities must perform SPSAs prior to and during the work.

7.15 COVID-19

Measures for protecting workers from exposure to, and infection with, SARS-CoV-2, the virus that causes Coronavirus Disease 2019 (COVID-19), depend on the type of work being performed and exposure risk,

including potential for interaction with people with suspected or confirmed COVID-19 and contamination of the work environment. Roux has performed an analysis of these risks based upon published government agency guidelines. Roux has developed health and safety guidance specific to COVID-19, which is provided as Appendix G.

8. Field Team Review

Each person performing work at or visiting this site shall sign this section after site-specific training is completed and before being permitted to access the CRZ or Exclusion Zone.

I have read and understand this Site-Specific Health and Safety Plan. I will comply with the provision contained therein.

Site/Project: 11-20 46th Road, Long Island City, New York

Name Printed	Signature	Date

9. Approvals

By their signature, the undersigned certify that this HASP is approved and will be utilized at the 11-20 46th Road Site.

Lauren Jenkins – Site Health and Safety Officer	June 10, 2020 Date
Kristina DeLuca - Office Health and Safety Manager	June 10, 2020 Date
Rachel Henke – Project Manager	June 10, 2020 Date
Robert Kovacs – Project Principal	June 10, 2020 Date

TABLE

Toxicological Properties of Hazardous Substances Present at the Site

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

References

U.S. Department of Labor. 1990. OSHA Regulated Hazardous Substances, industrial Exposure and Control Technologies Government Institutes, Inc.
Hawley's Condensed Chemical Dictionary, Sax, N. Van Nostrand and Reinhold Company, 11th Edition, 1987.
Proctor, N.H., J.P. Hughes and M.L. Fischman, 1989. Chemical Hazards of the Workplace. Van Nostrand Reinhold. New York.
Sax, N.I. and R.J. Lewis. 1989. Dangerous Properties of Industrial Materials. 7th Edition. Van Nostrand Reinhold. New York.
Guide to Occupational Exposure Values. 2008. American Conference of Governmental Industrial Hygienists (ACGIH).
NIOSH Pocket Guide to Chemical Hazards. 2005. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists.
BP – boiling point at 1 atmosphere, °F
C – Ceiling, is a concentration that should not be exceeded during and part of the working exposure.
Ca – considered by NIOSH to be a potential occupational carcinogen
CAS# Chemical Abstracts Service registry number which is unique for each chemical.
Fl. Pt. – Flash point
IDLH – Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health
LEL – Lower explosive (flammable) limit in air, % by volume (at room temperature)
mg/m^3 – Milligrams of substance per cubic meter of air
NIOSH – National Institute for Occupational Safety and Health.
OSHA – Occupational Safety and Health Administration
PEL - OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.
ppm – parts per million
REL – NIOSH Recommended Limit indicated a time weighted average concentration that must not be exceeded during any 10 hour work shift of a 40 hr work week
STEL – Short-term exposure limit
TLV – ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).
TWA – 8-hour, time-weighted average
UEL – Upper explosive (flammable) limit in air, % by volume (at room temperature)

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,1,1-Trichloroethane	71-55-6	TWA 350 ppm STEL 440 ppm C 440 ppm	C 350 ppm (1900 mg/m^3) [15-minute]	TWA 350 ppm (1900 mg/m^3)	700 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage	Eyes, skin, central nervous system, cardiovascular system, liver	Colorless liquid with a mild, chloroform-like odor. BP: 165°F UEL: 12.5% LEL: 7.5%
1,1,2-Trichloroethane	79-00-5	TWA 10 ppm	Ca TWA 10 ppm (45 mg/m^3) [skin]	TWA 10 ppm (45 mg/m^3) [skin]	Ca [100 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; central nervous system depression; liver, kidney damage; dermatitis; [potential occupational carcinogen]	Eyes, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, chloroform-like odor. BP: 237°F UEL: 15.5% LEL: 6%
1,1-Dichloroethane	75-34-3	TWA 100 ppm	TWA 100 ppm (400 mg/m^3)	TWA 100 ppm (400 mg/m^3)	3000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation skin; central nervous system depression; liver, kidney, lung damage	Skin, liver, kidneys, lungs, central nervous system	Colorless, oily liquid with a chloroform-like odor. BP: 135°F Fl.P: 2°F UEL: 11.4% LEL: 5.4%
1,1-Dichloroethene	75-35-4	TWA 5 ppm	Ca (lowest feasible concentration)	TWA 1ppm	Ca [N.D.]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor. BP: 89°F Fl.P: -2°F UEL: 15.5% LEL: 6.5% Class IA Flammable Liquid
1,2,4-Trimethylbenzene	95-63-6	None established	TWA 25 ppm (125mg/m^3)	None established	N.D.	Inhalation; ingestion; skin and/or eye contact	Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, confusion; chemical pneumonitis	Eyes, skin, resp sys, CNS, blood	Clear, colorless liquid with a distinctive, aromatic odor BP: 337°F FL.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable liquid
1,2,4-Trimethylbenzene	95-63-6	TWA 25 ppm (125 mg	TWA 25 ppm (125 mg/m^3)	None established	N.D.	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, fatigue, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood	Clear, colorless liquid with a distinctive, aromatic odor. BP: 337°F Fl.P: 112°F UEL: 6.4% LEL: 0.9% Class II Flammable Liquid
1,2-Dichlorobenzene	95-50-1	TWA 25 ppm STEL 50 ppm	C 50 ppm (300 mg/m^3)	C 50 ppm (300 mg/m^3)	200 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; liver, kidney damage; skin blisters	Eyes, skin, respiratory system, liver, kidneys	Colorless to pale-yellow liquid with a pleasant, aromatic odor. [herbicide] BP: 357°F Fl.P: 151°F UEL: 9.2% LEL: 2.2% Class IIIA Combustible Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
1,2-Dichloroethane	107-06-2	TWA 10 ppm	Ca TWA 1 ppm (4 mg/m^3) STEL 2 ppm (8 mg/m^3)	TWA 50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]	Ca [50 ppm]	inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eyes, skin, kidneys, liver, central nervous system, cardiovascular system	Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.] BP: 182°F Fl.P: 56°F UEL: 16% LEL: 6.2% Class IB Flammable Liquid
1,2-Dichloroethene (total)	540-59-0	TWA 200 ppm (790 m	TWA 200 ppm (790 mg/m^3)	TWA 200 ppm (790 mg/m^3)	1000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor BP: 118-140°F Fl.P: 36-39°F UEL: 12.8% LEL: 5.6% Class IB Flammable Liquid
1,3,5-Trimethylbenzene	108-67-8	None established	TWA 25 ppm (125mg/m^3)	None established	N.D.	Inhalation; ingestion; skin and/or eye contact	Eye, skin, nose, and throat, resp syst irritation; bronchitis; hypochromic anemia; headache, drowsiness, weakness, dizziness, nausea, incoordination, vomit, confusion; chemical pneumonitis	Eyes, skin, resp sys, CNS, blood	Clear, colorless liquid with a distinctive, aromatic odor BP: 329°F FL.P: 122°F Class II Flammable liquid
1,3,5-Trimethylbenzene	108-67-8	TWA 25 ppm (125 mg	TWA 25 ppm (125 mg/m^3)	None established	N.D	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood	Clear, colorless liquid with a distinctive, aromatic odor. BP: 329°F Fl.P: 122°F Class II Flammable Liquid
1,4-Dichlorobenzene	106-46-7	TWA 10 ppm	Ca	TWA 75 ppm (450 mg/m^3)	Ca [150 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Eye irritation, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen]	Liver, respiratory system, eyes, kidneys, skin	Colorless or white crystalline solid with a mothball-like odor. [insecticide] BP: 345°F Fl.P: 150°F LEL: 2.5% Combustible Solid
2,4-Dimethylphenol	105-67-9	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system, mouth, throat, stomach; dizziness, weakness, fatigue, nausea, headache; systemic damage; moderate to severe eye injury.	Skin, CVS, eyes, CNS	Clear, colorless liquid with a faint ether or chloroform-like odor BP: 178°F

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
2-Butanone (MEK)	78-93-3	TWA 200 ppm (590 mg/m^3) STEL 300 ppm (885 mg/m^3)	TWA 200 ppm (590 mg/m^3) STEL 300 ppm (885 mg/m^3)	TWA 200 ppm (590 mg/m^3)	3000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor. BP: 175°F Fl.P: 16°F UEL(200°F): 11.4% LEL(200°F): 1.4% Class IB Flammable Liquid
Acenaphthene	83-32-9	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system	Eyes, skin, respiratory system	Brown solid
Acetone	67-64-1	TWA 500 ppm STEL 50 ppm	TWA 250 ppm (590 mg/m^3)	TWA 1000 ppm (2400 mg/m^3)	2500 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a fragrant, mint-like odor BP: 133°F Fl.P: 0°F UEL: 12.8% LEL: 2.5% Class IB Flammable Liquid
Anthracene	65996-93-2	TWA 0.2 mg/m^3	Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m^3 (benzene-soluble fraction)	Ca [80 mg/m^3]	inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids
Antimony	7440-36-0	TWA 0.5 mg/m^3	TWA 0.5 mg/m^3	TWA 0.5 mg/m^3	50 mg/m^3 (as Sb	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly	Eyes, skin, respiratory system, cardiovascular system	Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder. BP: 2975°F
Arsenic (inorganic)	7440-38-2 (metal)	TWA 0.01 mg/m3	Ca C 0.002 mg/m3 [15-min]	TWA 0.010 mg/m3	Ca [5 mg/m3 (as As)]	Inhalation; ingestion; skin absorption; skin and/or eye contact	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]	Liver, kidneys, skin, lungs, lymphatic sys	Metal: sliver-gray or tin-white, brittle, odorless solid BP: sublimes
Asbestos	1332-21-4	TWA 0.1 f/cc	Ca 100,000 fibers/m3	TWA 0.1 fiber/cm3	Ca [IDLH value has not been determined]	Inhalation; ingestion; skin and/or eye contact	Asbestosis (chronic exposure), dyspnea, interstitial fibrosis, restricted pulmonary function, finger clubbing, irritation eyes, [potential occupational carcinogen]	Respiratory system, eyes,	White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite), fibrous, odorless solids. BP: decomposes
Asphalt fumes	8052-42-4	TWA 0.5 mg/m^3(fumes)	Ca C 5 mg/m3 [15 min]	None established	Ca [IDLH value has not been determined]	Skin absorption; inhalation; skin and/or eye contact	Irritation eyes, resp sys	Eyes, respiratory system	Black or dark brown cement-like substance Combustible solid
Barium	7440-39-3	TWA 0.5 mg/m3	None established	TWA 0.5 mg/m3	None established	Inhalation, ingestion, skin contact	Irritation, skin, respiratory system, (	Skin, eyes, respiratory system	Yellow white powder BP: 1640 C
Benzene	71-43-2	TWA 0.5 ppm STEL 2.5 ppm	Ca TWA 0.1 ppm STEL 1 ppm	TWA 1 ppm STEL 5 ppm	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]	Eyes, skin, respiratory system, blood, central nervous system, bone marrow	Colorless to light yellow liquid with an aromatic odor [Note: Solid below 42 °F] BP: 176°F Fl.Pt = 12°F LEL: 1.2% UEL: 7.8% Class B Flammable liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Benzo[a]anthracene	56-55-3	None established	None established	None established	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	Irritation eyes, skin, respiratory system, CNS	Skin	Pale Yellow crystal, solid BP: 438 C
Benzo[a]pyrene	50-32-8	None established	TWA 0.1 mg/m3	TWA 0.2 mg/m3	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	POISON. This material is an experimental carcinogen, mutagen, tumorigen, neoplastigen and teratogen. It is a probable carcinogen in humans and a known human mutagen. IARC Group 2A carcinogen. It is believed to cause bladder, skin and lung cancer. Exposure to it may damage the developing foetus. May cause reproductive damage. Skin, respiratory and eye irritant or burns.	Skin, eye, bladder, lung, reproductive	Yellow crystals or powder [found in cigarette smoke, coal tar, fuel exhaust gas and in many other sources] BP: 495 C
Benzo[b]fluoranthene	205-99-2	None established	TWA 0.1 mg/m3	TWA 0.2 mg/m3	None established	Inhalation; ingestion; skin and/or eye contact	No data were identified on the toxicity of benzo[b]fluoranthene to humans. Based on results of studies in animals, IARC concluded that benzo[b]fluoranthene is possibly carcinogenic to humans	Respiratory system, skin, bladder, kidneys	Off-white to tan powder
Benzo[k]fluoranthene	207-08-9	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory tract, gastrointestinal; fatal if swallowed, inhaled, absorbed through the skin; vomiting, nausea, diarrhea	Lungs, respiratory system	Yellow crystals BP: 480 C
Beryllium	7440-41-7 (metal)	TWA 0.002 mg/m^3	Ca C 0.0005 mg/m^3	TWA 0.002 mg/m^3 C 0.005 mg/m^3 (30 minutes) with a maximum peak of 0.025 mg/m^3	Ca [4 mg/m^3 (as Be)]	inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]	Eyes, skin, respiratory system	Metal: A hard, brittle, gray-white solid. BP: 4532°F
Bis(2-ethylhexyl) phthalate	117-81-7	TWA 5 mg/m^3	TWA 5 mg/m^3 STEL 10 mg/m^3 (do not exceed during andy 15-minute work period)	TWA 5 mg/m^3	None established	inhalation, skin and/or eye contact	Irritation eyes, skin, nose, throat; affect the nervous system and liver; damage to male reproductive glands	Eyes, skin, nose, respiratory system, nervous system, reproductive system, liver	Colorless to light colored, thick liquid with slight odor
Butane	106-97-8	TWA 1000 ppm	TWA 800 ppm (1900 mg/m^3)	None established	None established	inhalation, skin and/or eye contact (liquid)	Drowsiness, narcosis, asphyxia; liquid: frostbite	central nervous system	Colorless gas with a gasoline-like or natural gas odor. BP: 31°F UEL: 8.4% LEL: 1.6% Flammable Gas

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Cadmium	7440-43-9 (metal)	TWA 0.01 mg/m^3	Ca	TWA 0.005 mg/m^3	Ca [9 mg/m^3 (as Cd)]	inhalation, ingestion	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	respiratory system, kidneys, prostate, blood	Metal: Silver-white, blue-tinged lustrous, odorless solid. BP: 1409°F
Carbon Disulfide	75-15-0	TWA 1 ppm	TWA 1 ppm (3 mg/m^3) STEL 10 ppm (30 mg/m^3) [skin]	TWA 20 ppm C 30 ppm 100 ppm (30-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Dizziness, headache, poor sleep, lassitude (weakness, exhaustion), anxiety, anorexia, weight loss; psychosis; polyneuropathy; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects	central nervous system, peripheral nervous system, cardiovascular system, eyes, kidneys, liver, skin, reproductive system	Colorless to faint-yellow liquid with a sweet ether-like odor. BP: 116°F Fl.P: -22°F UEL: 50.0% LEL: 1.3% Class IB Flammable Liquid
Chlorobenzene	108-90-7	TWA 10 ppm	None established	TWA 75 ppm (350 mg/m^3)	1000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; drowsiness, incoordination; central nervous system depression; in animals: liver, lung, kidney injury	Eyes, skin, respiratory system, central nervous system, liver	Colorless liquid with an almond-like odor BP: 270°F Fl.P: 82°F UEL: 9.6% LEL: 1.3%
Chloroethane	75-00-3	TWA 100ppm	Handle with caution in the workplace	TWA 1000 ppm (2600 mg/m^3)	3800 ppm [10%LEL]	inhalation, skin absorption (liquid), ingestion (liquid), skin and/or eye contact	Incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage	Liver, kidneys, respiratory system, cardiovascular system, central nervous system	Colorless gas or liquid (below 54°F) with a pungent, ether-like odor. BP: 54°F Fl.P: NA (Gas) -58°F (Liquid) UEL: 15.4% LEL: 3.8% Flammable Gas
Chloroform	67-66-3	TWA 10 ppm	Ca STEL 2 ppm (9.78 mg/m^3) [60-minute]	C 50 ppm (240 mg/m^3)	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen]	Liver, kidneys, heart, eyes, skin, central nervous system	Colorless liquid with a pleasant odor BP: 143°F
Chromium	7440-47-3	TWA 0.5 mg/m^3 (metal and Cr III compounds) TWA 0.05 mg/m^3 (water-soluble Cr IV compounds) TWA 0.01 mg/m^3 (insoluble Cr IV compounds)	TWA 0.5 mg/m^3	TWA 1 mg/m^3	250 mg/m^3 (as Cr)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; lung fibrosis (histologic)	Eyes, skin, respiratory system	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid. BP: 4788°F
Chrysene; Phenanthrene; Pyrene; Coal tar pitch volatiles	65996-93-2	TWA 0.2 mg/m3	Ca TWA 0.1 mg/m^3 (cyclohexane-extractable fraction)	TWA 0.2 mg/m^3 (benzene-soluble fraction)	Ca [80 mg/m^3]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
cis-1,2-Dichloroethene	158-59-2	TWA 200 ppm	TWA 200 ppm	TWA 200 ppm	None established	inhalation, skin absorption, ingestion	Harmful if swallowed, inhaled, or absorbed through skin. Irritant. Narcotic. Suspected carcinogen	Skin	Colorless liquid BP: 60 C Fl.P: 4 C UEL: 12.8% LEL: 9.7 %
Copper	7440-50-8	TWA 0.2mg/m^3 (fume) 1 mg/m^3 (dusts and mists)	TWA 1 mg/m^3	TWA 1 mg/m^3	100 mg/m^3 (as Cu)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; cough, dyspnea (breathing difficulty), wheezing	Eyes, skin, respiratory system, liver, kidneys (increase(d) risk with Wilson's disease)	Noncombustible Solid in bulk form, but powdered form may ignite. BP: 4703°F
Dibenzo[a,h]anthracene	53-70-3	None established	None established	None established	None established	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin	Eyes, skin; skin photosensitization.	Colorless crystalline powder BP: 524°C
Diesel Fuel #2	68476-34-6	None established	None established	Designated as an OSHA Select Carcinogen	None established	ingestion, skin and/or eye contact	Kidney damage; potential lung damage; suspected carcinogen; irritation of eyes, skin, respiratory tract; dizziness, headache, nausea; chemical pneumonitis (from aspiration of liquid); dry, red skin; irritant contact dermatitis; eye redness, pain.	Eyes, skin, kidneys	Clear yellow brown combustible liquid; floats on water; distinct diesel petroleum hydrocarbon odor. BP: 356-716°F Fl.P: 154.4-165.2°F LEL: 0.6% UEL: 7.0%
Ethylbenzene	100-41-4	TWA 100 ppm STEL 125 ppm	TWA 100 ppm (435 mg/m^3) STEL 125 ppm (545 mg/m^3)	TWA 100 ppm (435 mg/m^3)	800 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with an aromatic odor. BP: 277°F Fl.P: 55°F UEL: 6.7% LEL: 0.8% Class IB Flammable Liquid
Fluoranthene	206-44-0	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible burns; heart and liver injury, pulmonary edema, respiratory arrest, gastrointestinal disturbances.	Heart, liver, lungs.	Yellow needles.
Fluorene	86-73-7	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation skin, digestive tract	Skin	White crystals BP: 563°F
Fuel Oil #2	68476-30-2	TWA 100mg/m^3 (aerosol and vapor, as total hydrocarbons)	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; CNS effects; nausea, vomiting, headache, cramping, dizziness, weakness, loss of coordination,, drowsiness; kidney, liver damage	Eyes, skin, CNS	Clear or yellow to red oily liquid, kerosene-like odor BP: 347 - 689 °F UEL:5-6% LEL: 0.7-1.0%
Gasoline	8006-61-9	TWA 300 ppm STEL 500 ppm	Carcinogen	None established	Ca [IDLH value has not been determined]	Skin absorption; inhalation; ingestion; skin and/or eye contact	Eyes and skin irritation, mucous membrane; dermatitis; headache; listlessness, blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis; possible liver, kidney damage [Potential occupational carcinogen]	Eyes, skin, respiratory system, CNS, Liver, Kidneys	Clear liquid with a characteristic odor, aromatic Fl.Pt = -45°F LEL = 1.4% UEL = 7.6% Class 1B Flammable Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Hexachlorobutadiene	87-68-3	TWA 0.02 ppm	Ca TWA 0.02 ppm (0.24 mg/m^3) [skin]	None established	Ca [N.D.]	inhalation, skin absorption, ingestion, skin and/or eye contact	In animals: irritation eyes, skin, respiratory system; kidney damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, kidneys	Clear, colorless liquid with a mild, turpentine-like odor. BP: 419°F
Hydrogen Sulfide	7783-06-4	TWA (1 ppm) STEL (5 ppm) (adopted values for which changes are proposed in the NIC)	C 10 ppm (15 mg/m^3) [10-minute]	C 20 ppm 50 ppm [10-minute maximum peak]	100 ppm	inhalation, skin and/or eye contact	Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance; liquid: frostbite	Eyes, respiratory system, central nervous system	Colorless gas with a strong odor of rotten eggs. BP: -77°F UEL: 44.0% LEL: 4.0% Flammable Gas
Indeno[1,2,3-cd]pyrene	193-39-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impairment of blood forming tissue	Skin	Fluorescent green-yellow crystalline solid BP: 536 C
Indeno[1,2,3-cd]pyrene	193-39-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impairment of blood forming tissue	Skin	Yellowish crystal solid BP: 536 C
Isopropylbenzene	98-82-8	TWA 50 ppm	TWA 50 ppm (245 mg/m^3) [skin]	TWA 50 ppm (245 mg/m^3) [skin]	900 ppm [10%LEL]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with a sharp, penetrating, aromatic odor. BP: 306°F Fl.P: 96°F UEL: 6.5% LEL: 0.9%
Kerosene	8008-20-6	TWA 200 mg/m^3	TWA 100 mg/m^3	None established	IDLH value has not been determined	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system	Colorless to yellowish, oily liquid with a strong, characteristic odor. BP: 347-617°F Fl.P: 100-162°F UEL: 5% LEL: 0.7% Class II Combustible Liquid
Lead	7439-92-1	TWA 0.05 mg/m^3	TWA (8-hour) 0.050 mg/m^3	TWA 0.050 mg/m^3	100 mg/m^3 (as Pb)	inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. BP: 3164°F Noncombustible Solid in bulk form

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Manganese	7439-96-5 (metal)	TWA 0.2 mg/m^3	TWA 1 mg/m^3 STEL 3 mg/m^3	C 5 mg/m^3	500 mg/m^3 (as Mn)	inhalation, ingestion	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	respiratory system, central nervous system, blood, kidneys	A lustrous, brittle, silvery solid. BP: 3564°F
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 STEL 0.03 mg/m^3 [skin]	TWA 0.01 mg/m^3 C 0.04 mg/m^3	2 mg/m^3 (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Paresthesia; ataxia, dysarthria; vision, hearing disturbance; spasticity, jerking limbs; dizziness; salivation; lacrimation (discharge of tears); nausea, vomiting, diarrhea, constipation; skin burns; emotional disturbance; kidney injury; possible teratogenic effects	Eyes, skin, central nervous system, peripheral nervous system, kidneys	Appearance and odor vary depending upon the specific (organo) alkyl mercury compound
Mercury compounds [except (organo) alkyls] (as Hg) Mercury	7439-97-6	TWA 0.025 mg/m^3 (elemental and inorganic forms)	Hg Vapor: TWA 0.05 mg/m^3 [skin] Other: C 0.1 mg/m3 [skin]	TWA 0.1 mg/m^3	10 mg/m^3 (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eyes, skin, respiratory system, central nervous system, kidneys	Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.] BP: 674°F
Methyl tert-butyl ether (MTBE)	1634-04-4	TWA 50 ppm	No established REL	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, mucous membrane, respiratory; dizziness, nausea, headache, intoxication	Eyes, skin, mucous membrane, respiratory system, central nervous system	Colorless liquid BP: 55.2 C
Methylene Chloride	75-09-2	TWA 50 ppm, A3 - suspected human carcinogen	Ca	TWA 25 ppm STEL 125 ppm	Ca [2300 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numbness, tingle limbs; nausea; [potential occupational carcinogen]	Eyes, skin, cardiovascular system, central nervous system	Colorless liquid with a chloroform-like odor BP: 104°F UEL: 23% LEL: 13%
Naphtha (coal tar)	8030-30-6	None established	TWA 100 ppm (400 mg/m^3)	TWA 100 ppm (400 mg/m^3)	1000 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; dizziness, drowsiness; dermatitis; in animals: liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Reddish-brown, mobile liquid with an aromatic odor BP: 320-428°F Fl.P: 100-109°F Class II Combustible Liquid
Naphthalene	91-20-3	TWA 10 ppm STEL 15 ppm	TWA 10 ppm (50 mg/m^3) STEL 15 ppm (75 mg/m^3)	TWA 10 ppm (50 mg/m^3)	250 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	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	Eyes, skin, blood, liver, kidneys, central nervous system	Colorless to brown solid with an odor of mothballs. BP: 424°F Fl.P: 174°F UEL: 5.9% LEL: 0.9%

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
n-Butylbenzene	104-51-8	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; CNS depression, lung damage; nausea, vomiting, headache, dizziness, weakness, loss of coordination, blurred vision, drowsiness, confusion, disorientation	Eyes, skin,respiratory system, central nervous system	Colorless liquid with a sweet odor BP: 183 C Fl.P: 59 C UEL: 5.8% LEL: 0.8%
Nickel	7440-02-0 (Metal)	TWA 1.5 mg/m^3 (elemental) TWA 0.1 mg/m^3 (soluble inorganic compounds) TWA 0.2 mg/m^3 (insoluble inorganic compounds) TWA 0.1 mg/m^3 (Nickle subsulfide)	Ca TWA 0.015 mg/m^3	TWA 1 mg/m^3	Ca [10 mg/m^3 (as Ni)]	inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Nasal cavities, lungs, skin	Metal: Lustrous, silvery, odorless solid. BP: 5139°F
Nitrobenzene	98-95-3	TWA 1 ppm	TWA 1 ppm (5 mg/m^3) [skin]	TWA 1 ppm (5 mg/m^3) [skin]	200 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; anoxia; dermatitis; anemia; methemoglobinemia; in animals: liver, kidney damage; testicular effects	Eyes, skin, blood, liver, kidneys, cardiovascular system, reproductive system	Yellow, oily liquid with a pungent odor like paste shoe polish. BP: 411°F Fl.P: 190°F LEL(200°F): 1.8%
n-Propylbenzene	103-65-1	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Harmful if swallowed, Irritation eyes, skin, digestive tract, respiratory tract, central nervous system	Eyes, skin, central nervous system, respiratory system	colorless or light yellow liquid BP: 159 C Fl.P: 47 C UEL: 6% LEL: 0.8%
Petroleum hydrocarbons(Petroleum distillates)	8002-05-9	None established	TWA 350 mg/m^3 C 1800 mg/m^3 [15 min]	TWA 500 ppm (2000 mg/m^3)	1,100 [10% LEL]	Inhalation; ingestion; skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, drowsiness, headache, nausea; dried/cracked skin; chemical pneumonitis	CNS, eyes, respiratory system, skin	Colorless liquid with a gasoline or kerosene-like odor BP: 86-460°F Fl. Pt = -40 to -86°F UEL: 5.9% LEL: 1.1% Flammable liquid
Phenol	108-95-2	TWA 5 ppm	TWA 5 ppm (19 mg/m^3) C 15.6 ppm (60 mg/m^3) [15-minute] [skin]	TWA 5 ppm (19 mg/m^3) [skin]	250 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	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	Eyes, skin, respiratory system, liver, kidneys	Colorless to light-pink, crystalline solid with a sweet, acrid odor. BP: 359°F UEL: 8.6% LEL: 1.8%
p-Isopropyltoluene	99-87-6	None established	None established	None established	None established	inhalation, skin absorption, eye contact	Irritation skin	CNS, skin	Colorless, clear liquid, sweetish aromatic odor BP: 350.8°F Class III Flammable liquid
sec-Butylbenzene	135-98-8	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, upper airway; central nervous system, headache, dizziness; gastrointestinal disturbance	Respiratory system, central nervous system, eyes, skin;	Colorless liquid BP: 344°F Fl.P: 126 °F UEL: 6.9% LEL: 0.8% Combustible liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Selenium	7782-49-2	TWA 0.2 mg/m^3	TWA 0.2 mg/m^3	TWA 0.2 mg/m^3	1 mg/m^3 (as Se)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage	Eyes, skin, respiratory system, liver, kidneys, blood, spleen	Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.] BP: 1265°F
Silver	7440-22-4 (metal)	TWA 0.1 mg/m^3 (metal, dust, fumes) TWA 0.01 mg/m^3 (Soluble compounds, as Ag)	TWA 0.01 mg/m^3	TWA 0.01 mg/m^3	10 mg/m^3 (as Ag)	inhalation, ingestion, skin and/or eye contact	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance	Nasal septum, skin, eyes	Metal: White, lustrous solid BP: 3632°F
Slop Oil	69029-75-0	None established	None established	None established	None established	Inhalation; ingestion	Irritation eyes, skin, gastrointestinal tract	Eyes, skin, gastrointestinal tract	Clear light to dark amber liquid, with mild hydrocarbon odor. BP: >500°F Fl.P : 250°F
Sulfuric Acid	7664-93-9	TWA 0.2 mg/m^3	TWA 1 mg/m^3	TWA 1 mg/m^3	15 mg/m^3	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatis; dental erosion; eye, skin burns; dermatitis	Eyes, skin, respiratory system, teeth	Colorless to dark-brown, oily, odorless liquid. BP: 554°F Noncombustible Liquid
tert-Butylbenzene	98-06-6	None established	None established	None established	None established	inhalation, skin absorption, ingestion,	Eye and respiratory irritant; CNS depression; liver or kidney damage	Respiratory system, central nervous system, eyes, liver, kidney	Colorless liquid with an aromatic odor BP: 168 - 169 C Fl.P: 34 C UEL:5.6 % LEL: 0.8 %
Tetrachloroethene	127-18-4	TWA 25 ppm STEL 100 ppm (STEL) listed as A3, animal carcinogen	Ca Minimize workplace exposure concentrations	TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm	Ca [150 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system	Colorless liquid with a mild, chloroform-like odor. BP: 250°F Noncombustible Liquid
Toluene	108-88-3	TWA 20 ppm	TWA 100 ppm (375 mg/m^3) STEL 150 ppm (560 mg/m^3)	TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, pungent, benzene-like odor. BP: 232°F Fl.P: 40°F UEL: 7.1% LEL: 1.1% Class IB Flammable Liquid
trans-1,2-Dichloroethene	156-60-5	TWA 200 ppm	None established	TWA 200 ppm STEL 250 ppm (skin)	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Narcotic. Irritation eyes, skin, respiratory tract, mucous membrane; CNS depression.	Respiratory tract, mucous membrane, eyes, skin, CNS	Colorless liquid with a fruity pleasant odor BP: 48°C Fl.P 6C UEL: 12.8% LEL: 9.7%

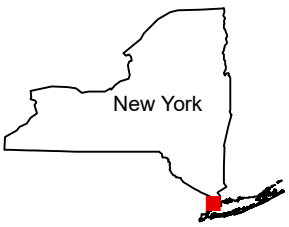
Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 11-20 46th Road, Long Island City, Queens, NY

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Trichloroethene	79-01-6	TWA 10 ppm STEL 25 ppm	Ca	TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)	Ca [1000 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system	Colorless liquid (unless dyed blue) with a chloroform-like odor. BP: 189°F UEL(77°F): 10.5% LEL(77°F): 8%
Vinyl Chloride	75-01-4	TWA 1 ppm	Carcinogen	TWA 1 ppm C 5 ppm [15-minute]	Ca [IDLH value has not been determined]	inhalation, skin, and/or eye contact (liquid)	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]	Liver, central nervous system, blood, respiratory system, lymphatic system	Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. BP: 7°F UEL: 33.0% LEL: 3.6% Flammable Gas
Xylene (m, o & p isomers)	108-38-3, 95-47-6, 106-42-3	TWA 100 ppm (435 mg/m^3) STEL 150 ppm	TWA 100 ppm (435 mg/m^3)	TWA 100 ppm (435 mg/m^3)	900 ppm	Skin absorption, inhalation, ingestion, skin, and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys	Colorless liquid with an aromatic odor BP: 282°F, 292°F, 281°F Fl. Pt. 82°F, 90°F, 81°F LEL: 1.1%, 0.9%, 1.1% UEL: 7.0%, 6.7%, 7.0% Class C Flammable Liquid
Zinc	7440-66-6	TWA 10 mg/m3 (Inhalable fraction)	None established	TWA 10 mg/m3 (for zinc oxide fume)	None established	skin and/or eye contact, inhalation, ingestion	Irritation eyes, skin, respiratory tract; gastrointestinal disturbances	Eyes, skin, respiratory system	Bluish gray solid BP: 1664.6°F Flammable

FIGURES

1. Site Location Map
2. Hospital Route Map
3. Urgent Care Route Map

QUADRANGLE LOCATION



N

1,000 0 1,000'

Title:

SITE LOCATION MAP

11-20 46TH ROAD
LONG ISLAND CITY, NY 11101

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: S.C.	Date: 11/25/19	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	
Project Mgr: R,H,	Project: 3371.0001Y000	1
File: 3371.0001Y109.1.mxd		

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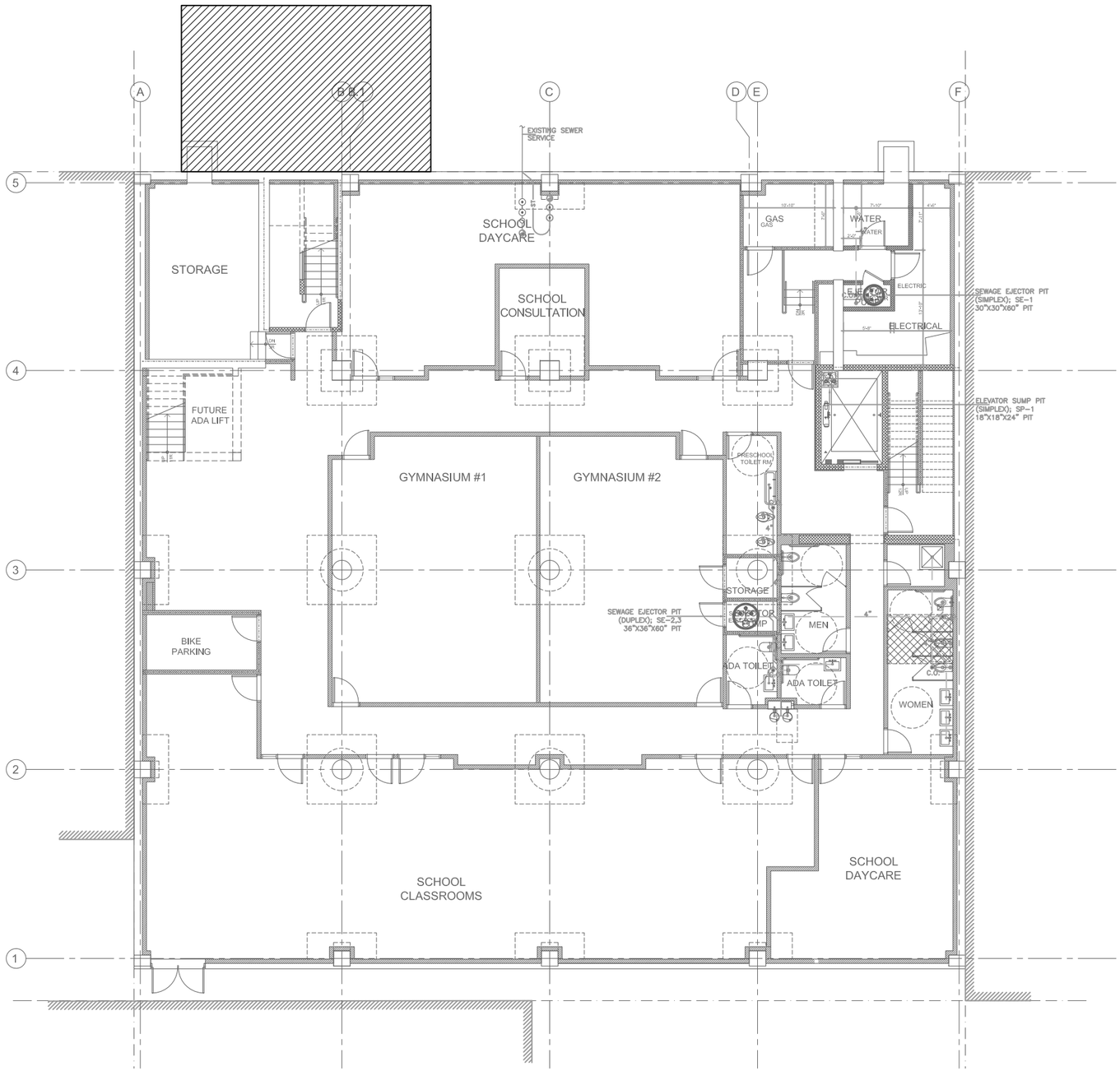

LEGEND

MUSTER AREA

15' 0 15'

Title:

SITE PLAN WITH EMERGENCY MUSTER AREA

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: R.H.	Date: 20NOV19	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	2
Project Mgr: R.H.	Project: 3371.0001Y000	
File: 3371.0001Y109.01.DWG		

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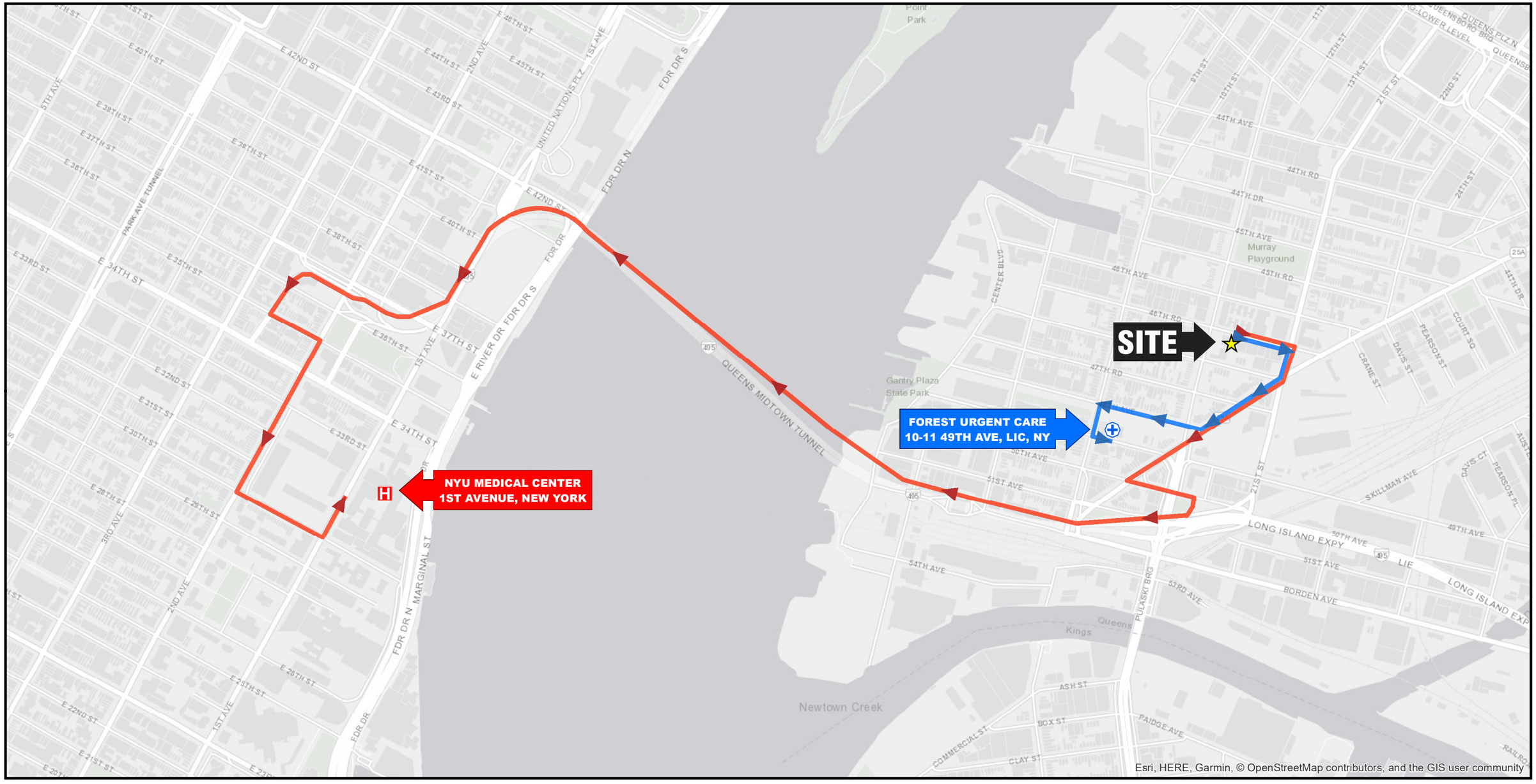

DIRECTIONS TO HOSPITAL

1. HEAD EAST ON 46H ST
2. TURN RIGHT ONTO 21ST ST
3. TURN RIGHT ONTO JACKSON AVE
4. TURN LEFT ONTO 50TH AVE
5. MERGE ONTO I-495 W
6. TAKE QUEENS MIDTOWN TUNNEL AND 2ND AVE TO 1ST AVENUE IN MANHATTAN
7. USE THE LEFT LANE TO TAKE THE EXIT TOWARD DOWNTOWN
8. TURN LEFT ONTO E 35TH ST
9. TURN RIGHT ONTO 2ND AVE
10. TURN LEFT ONTO E 30TH ST
11. TURN LEFT ONTO 1ST AVENUE

DIRECTIONS TO URGENT CARE

1. TAKE 47TH AVE TO 11TH ST
2. TURN RIGHT ONTO 11TH ST
3. TURN RIGHT ONTO 46TH RD
4. TAKE JACKSON AVE TO 48TH AVE
5. TURN RIGHT ONTO 48TH AVE
6. TURN LEFT ONTO VERNON BLVD
7. TURN LEFT ONTO 49TH AVE

N

750 0 750'

Title:

ROUTES TO URGENT CARE AND HOPSITAL

11-20 46TH ROAD
LONG ISLAND CITY, NY 11101

Prepared for:

11-20 46TH ROAD OWNER LLC

ROUX

Compiled by: S.C.	Date: 11/25/19	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	3
Project Mgr: R,H,	Project: 3371.0001Y000	
File: 3371.0001Y109.2.mxd		

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APPENDICES

A. Job Safety Analysis (JSA) Forms
B. SDSs for Chemicals Used
C. Incident Investigation and Reporting Program
D. Heavy Equipment Exclusion Zone Policy
E. Subsurface Utility Clearance Management Program
F. Personal Protective Equipment (PPE) Management Program
G. COVID-19 Interim Health and Safety Guidance

APPENDIX A

Job Safety Analysis (JSA) Forms

JOB SAFETY ANALYSIS	Cntrl. No.	DATE:	☒ NEW ☐ REVISED	PAGE 1 of 2
JSA TYPE CATEGORY **GENERIC**	WORK TYPE	WORK ACTIVITY (Description)		

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☐ GLOVES:
☐ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☐ PPE CLOTHING:	
☐ SAFETY GLASSES	☐ SAFETY SHOES		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment:

Commitment to LPS – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE: A _ foot exclusion zone will be maintained around (indicate equipment).

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. [INSERT JOB STEP]	**1a. CONTACT:** [INSERT HAZARD]	1a.
	1b. CAUGHT: [INSERT HAZARD]	1b.
	1c. FALL: [INSERT HAZARD]	1c.
	1d. EXPOSURE: [INSERT HAZARD]	1d.
	1e. EXERTION: [INSERT HAZARD]	1e.
	1f. ENERGY SOURCE: [INSERT HAZARD]	1f.
2. [INSERT JOB STEP]	**2a. CONTACT:** [INSERT HAZARD]	2a.
	2b. CAUGHT: [INSERT HAZARD]	2b.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

	2c. FALL: [INSERT HAZARD]	2c.
	2d. EXPOSURE: [INSERT HAZARD]	2d.
	2e. EXERTION: [INSERT HAZARD]	2e.
	2f. ENERGY SOURCE: [INSERT HAZARD]	2f.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-009	DATE: 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 1

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**O&M**	**Movement of 55-Gallon Drums/Drum Handling with Mobile Carrier**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Michael Sarni	Technician	Brian Hobbs	Senior Health & Safety Manager
		Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Cut-resistant gloves
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER:
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent long sleeve shirt or long sleeve shirt and reflective safety vest.	
☒ SAFETY GLASSES	☒ SAFETY SHOES: Steel or composite toe		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Mobile Drum Carrier, safety cones, and caution tape

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ): A 10-foot exclusion zone will be maintained around heavy equipment (i.e. forklift).

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Preparing for and Inspection of Drum	**1a. FALL:** Tripping/falling due to uneven surface. Loose debris/garbage in work area.	1a. Clear area of loose garbage and debris. Inspect 55-gal drums for proper condition, labeling, check drum ring and bolts for tightness, inspect mobile drum carrier. 1a. Do a Test Lift to get a general sense of the weight of the drum. 1a. Inspect and use established pathways to avoid uneven terrain, weather-related hazards (i.e., debris, puddles, ice, etc.), and other obstructions. 1a. Secure work area and coordinate and communicate the planned work activities with other personnel working in the area. 1a. Delineate work area with 42" safety cones.
	1b. CONTACT/EXPOSURE: Drums could potentially be damaged or contain hazardous material. Mobile drum carrier could potentially be in poor working condition causing malfunctioning during operation.	1b. Prior to inspecting drums don cut-resistant gloves. If drum is not properly labeled, do not open and cease all drum transport activities. Immediately contact project manager and inform him/her of drum situation. 1b. Do not continue drum transport activities until further actions are determined by the project manager. 1b. If the drum is properly labeled, but leaking, improperly sealed or in poor condition, place drum in an over-pack drum. 1b. Inspect mobile drum carrier to ensure its overall integrity. Look for rust marks or potential weak points where the drum carrier could malfunction. Inspect the wheels to ensure that they easily turn and nothing is impeding their movement.
	1c. EXERTION/CAUGHT: Potential pinching/exertion hazards while securing ring/ tightening bolts	1c. Keep back straight and knees slightly bent while securing drum ring/tightening bolt. Wear cut-resistant gloves.
2. Position drum clamp tightly in between drum ribs, securing drum clamp to drum with chain	**2a. CAUGHT:** Pinching fingers between drum clamp and handle/chain.	2a. Attach drum clamp with chain and tighten until snug. Do not place hands between drum clamp and drum as the chain is tightened; wear cut resistant gloves. Keep face away from drum when handling in case of escaping vapors.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Disengage safety latches on handle, pull handle down until drum is lifted off ground and safety latches are reengaged; slightly suspending drum off the ground	**3a. EXERTION/ CONTACT:** Potential muscle strain associated with lifting/engaging drum/handle. Drum could shift/slip downward and crush toes.	3a. Ascertain whether the drum is overweight; if it is, then two people are needed to lower handle while drum is secured with clamp so that safety latches can be engaged. Keep body out of the line of fire of the handle (do not position head above handle) as it is being pushed down. Do not allow feet/toes to be positioned under the drum as it is being lifted; wear steel/composite toe boots.
	3b. CAUGHT: Fingers could be pinched while engaging/disengaging safety latches on handle	3b. Wear cut-resistant gloves while disengaging/reengaging safety latches. 3b. Avoid placing hands in pinch points.
4. Transport drums to designated location and disengage drum clamp (repeat Step 3 in reverse order)	**4a. FALL:** Tripping/ falling due to obstructions and uneven terrain. Potential for drum to fall during transport.	4a. Ensure transport path is free of potential obstructions that may cause the drum/carrier to become unstable. Position drum clamp between the ribs on the drum to prevent possible slipping.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

JOB SAFETY ANALYSIS	Ctrl. No. GEN-015	DATE: 1/4/2018	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)	
GENERIC	**Site Recon**	**Mobilization/Demobilization**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Rebecca Lowy	Staff Assistant Geologist	Brian Hobbs	Senior Health & Safety Manager
Tally Sodre	OHSM	Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Steel Toe or composite toe	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest of high-visibility clothing; long sleeve shirt; long pants	☒ GLOVES: Leather, nitrile, and cut resistant (as needed) ☐ OTHER

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: None

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ): A 10-foot exclusion zone will be maintained around equipment in use..

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilize/demobilize and establish work area	**1a. FALL:** Slip/trips/falls from obstructions, uneven terrain, weather conditions, heavy loads, and/or poor housekeeping.	1a. Use 3 points-of-contact/ensure secure footing when entering and exiting vehicle. 1a. Inspect walking path for uneven terrain, steep hills, obstructions, and/or weather-related hazards (i.e., ice, snow, and puddles) prior to mobilizing equipment. Use established pathways. Walk on stable/secure ground. 1a. Do not climb over stored materials/equipment; walk around. Practice good housekeeping; organize and store equipment neatly in one area at its lowest potential energy. 1a. Wear boots with adequate treads. 1a. Delineate unsafe areas with 42” cones, caution tape and/or flagging.
	1b. CONTACT: Personal injury and/or property damage caused by being struck by Site traffic or equipment used in Site activities.	1b. Observe and maintain the posted speed limits. 1b. When first arriving onsite, park vehicles in designated parking space and/or out of the way locations. Use parking brake on all vehicles and tire chocks on work trucks and trailers. 1b. Check in with Site Manager/Supervisor to ensure coordination with other Site activities and to discuss any special hazards. Ensure that short-service employees (SSE) are identified. 1b. Identify potential traffic sources. 1b. Wear PPE including high visibility clothing or reflective vest. 1b. Use a spotter while moving work vehicles; plan ahead to avoid backing whenever possible. 1b. Maintain a minimum 10’ exclusion zone when vehicles are in motion. When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver-to-spotter visibility. 1b. Delineate work area with 42” cones, flags, caution tape, and/or other barriers. 1b. Position “Work Area” signs at Site entrances, if possible, or at either side of work area.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
		1b. Position largest vehicle to protect against oncoming traffic. 1b. Face traffic, maintain eye contact with oncoming vehicles, use a spotter, and establish a safe exit route. 1b. Observe potential overhead and ground surface features that may interfere with moving equipment. Clear the path of physical hazards prior to initiating mobilization.
	1c. CAUGHT: Personal injury from pinch points and being in line-of-fire of vehicle and/or equipment.	1c. Make sure driver has engaged parking brake and placed wheel chocks in a position to prevent movement. Be sure that vehicle is parked in front/down gradient (positioned to best block oncoming traffic) of work area. 1c. Wear leather gloves when handling any tools or equipment. Wear cut-resistant gloves (Kevlar or similar) when handling sharp objects/cutting tools/glass. 1c. Keep body parts away from line-of-fire of equipment. 1c. Always carry tools by the handles and/or designated carrier. Ensure sharp-edged tools are sheathed/secure. 1c. Remove any loose jewelry. Avoid wearing loose clothing and/or ensure loose clothing is secure. 1c. Secure all items on the equipment, tighten up any items or features that have potential to shift or break during mobilization.
	1d. OVEREXERTION: Muscle strains while lifting/carrying equipment.	1d. Use body positioning and lifting techniques that avoid muscle strain; keep back straight, lift with legs, turn with whole body, keep load close to body, and never reach with a load. 1d. Ensure that loads are balanced. Use assistance (mechanical or additional person) to carry equipment that is either unwieldy or over 50 lbs.
	1e. EXPOSURE: Personal injury from exposure to biological and environmental hazards.	1e. Inspect area to avoid contact with biological hazards (i.e. poisonous plants, stinging insects, ticks, etc.). 1e. Wear long sleeved clothes treated with Permethrin, apply insect repellant containing DEET to exposed skin, and inspect clothes and skin for ticks during and after work. 1e. Apply sunscreen (SPF 15+) if exposure to sun for 30 minutes or more is expected.
	1f. EXPOSURE: Weather related injuries.	1f. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, nausea, rapid and shallow breathing). Take breaks in cool places and hydrate as needed. 1f. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks in warm areas as needed. 1f. Wear clothing appropriate for weather and temperature conditions (e.g., rain jackets, snow pants, multiple layers). 1f. If lightning is observed, wait 30 minutes in a sheltered location (car is acceptable) before resuming work.
	1g. EXPOSURE: Personal injury from noise hazards.	1g. Wear hearing protection if sound levels exceed 85 dBA (if you must raise your voice for normal conversation).

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JOB SAFETYANALYSIS Ctrl. No. GEN-020	DATE: 1/4/2018	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY: **GENERIC**	WORK TYPE: **Gauging & Sampling**	WORK ACTIVITY (Description): **Soil Sampling**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
MaryBeth Lyons	Project Scientist	Brian Hobbs	Senior Health & Safety Manager
		Joe Gentile	Corporate Health and Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES ☒ FLAME RESISTANT CLOTHING (as needed)	☐ GOGGLES ☐ FACE SHIELD: ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Recommended Equipment: 42" traffic cones, caution tape, trowel

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): A 10-foot exclusion zone will be maintained around moving equipment, if present.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Secure location	**1a. CONTACT:** Personnel and vehicular traffic may enter the work area.	1a. If in an area with foot or vehicle traffic, delineate the work area with 42" traffic cones and/or caution tape to prevent exposure to traffic and inform others of work activity. 1a. Wear reflective vest and/or high visibility clothing. 1a. Face the direction of any vehicular traffic. Position vehicle to protect worker from traffic. 1a. Communicate work activity with adjacent work areas.
	1b. FALL: Tripping/falling due to uneven terrain or entry/exit from excavations.	1b. Inspect pathways and work area for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions. 1b. Use established pathways and walk on stable, secure ground. 1b. Stage equipment and tools in a convenient, stable, and orderly manner. Store equipment at lowest potential energy. 1b. Roux employees should stay 5 feet from in-progress excavations and trenches. Should entry to an excavation be required (when stabilization is complete), ladders must be employed for steep embankments, excavations, pits, and trenches.
	1c. EXPOSURE: Exposure to sun and excessive heat, possibly causing sunburn, heat exhaustion or heat stroke. Exposure to cold temperatures possibly causing cold stress. Skin burn as a result of fire, if applicable. Exposure to explosive vapors due to tank farm operations. Exposure to airborne dust due to high wind speeds. Biological hazards - ticks, bees/wasps, poison ivy, thorns, insects, etc.	1c. Wear sunscreen with an SPF 15 or greater whenever 30 minutes or more of exposure is expected. 1c. Use a tent to shade the work area from direct sunlight particularly when warm temperatures are expected. 1c. Be aware of the location of all Site personnel. 1c. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). 1c. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). 1c. Take breaks for rest and water as necessary. Move to an area that is well shaded or a climate controlled area (i.e., car, site trailer, etc.). 1c. No open flames/heat sources. 1c. Flame retardant clothing must be worn when specified by Site policy. 1c. Cell phones should be disabled when specified by Site policy. 1c. Pre-treat field clothing with Permethrin prior to site visit to kill ticks and insects. 1c. Wear long sleeved shirts and tuck in (or tape) pant legs into socks or boots to prevent ticks from reaching skin. 1c. Spray insect repellant containing DEET on exposed skin when working in overgrown areas of the Site. 1c. Inspect area to avoid contact with biological hazards. 1c. Wear cut-resistant gloves when handling branches, shrubs, etc. that may lie within the walking path. 1c. Wear spoggles if the average wind speeds are above 15 mph. 1c. Personnel shall examine themselves and co-worker's outer clothing for ticks periodically when onsite. 1c. If skin comes in contact with poison ivy, wash skin thoroughly with soap and water. If rash persists after washing, immediately notify your supervisor, the OM and OHSM for possible consultation with a physician at an approved Occupational Health Clinic.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Collect Soil Sample	**2a. CONTACT:** Personal injury from pinch points, cuts, and abrasions from sampling equipment tools, and material within soil sample. Personal injury from contact with moving equipment while sampling. Personal injury from contact with glass sample jars.	2a. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant (nitrile) disposable gloves when handling soil samples and sampling jars. 2a. Where possible, use trowel or equivalent tool to avoid contact with soil. 2a. If sampling from bucket of heavy equipment, ensure all equipment is off and operator utilizes the “show me your hands” policy. 2a. See 1a.
	2b. EXPOSURE: Exposure to contamination (impacted soil) and/or lab preservatives.	2b. Wear chemical-resistant (nitrile) disposable gloves over cut resistant gloves to protect hands when handling samples; use containment material or plastic sheeting to protect surrounding areas. 2b. Wear safety glasses to protect eyes from dust or air-borne contaminants that may results from disturbing the soil. 2b. Where possible, remain upgradient from sample location if collecting soil sample from stockpile, drill rig, etc. to avoid breathing contaminant vapors, if they are present. 2b. When collecting soil sample from hand auger, put large zip lock bag over entire auger to prevent spillage of soil on to the ground. 2b. Open sample jars slowly and fill carefully to avoid contact with preservatives.
	2c. EXERTION: Exertion due to repetitive motion and ergonomics.	2c. Utilize a table or raised surface for soil sampling if multiple soil samples are going to be taken to minimize repetitive bending motion.
3. Decontaminate equipment	**3a. EXPOSURE/CONTACT:** Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated vapors and/or soil). **3b. EXPOSURE:** Chemicals in cleaning solution including ammonia.	3a. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3a. Use an absorbent pad to clean spills. 3a. Properly dispose of used materials/PPE in provided drums in designated drum storage area. 3a. Remain upwind of sample and avoid breathing contaminant vapors, if they are present. 3b. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3b. Work on the upwind side of decontamination area. 3b. Use an absorbent pad to clean spills. 3b. Properly dispose of used materials/PPE in provided drums in designated drum storage area. Ensure that all drums are properly labeled and secured.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-006	DATE 8/6/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):	
Generic	**Drilling**	**Direct Push Soil Borings / Well Installation**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Timothy Zei	Project Hydrogeologist	Raymond Olson	Staff Assistant Geologist
		Christine Pietrzyk	Office Health & Safety Manager
		Brian Hobbs	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing, Long Sleeve Shirt	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Geoprobe or Truck-Mounted Direct Push Drill Rig, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Macrocore liners, Liner Opening Tool, 20 lb. Type ABC Fire Extinguisher, 42" Cones & Flags, "Work Area" Signs, Water

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ) – All non-essential personnel will maintain a distance of 10 feet from drilling equipment while equipment is moving/engaged

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization of drilling rig (ensure the Subsurface Clearance Protocol and Drill Rig Checklist are completed)	**1a. CONTACT:** Equipment/property damage.	1a. The drill rig's tower/derrick will be lowered and secured prior to mobilization. 1a. A spotter should be utilized while moving the drill rig. If personnel move into the path of the drill rig, the drill rig will be stopped until the path is again clear. Use a spotter for all required backing operations. 1a. Set-up the work area and position equipment in a manner that eliminates or reduces the need for backing of support trucks and trailers. 1a. When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver visibility. 1a. Inspect the driving path for uneven terrain. Level or avoid if needed. 1a. Drill rig should have a minimum **exclusion zone of 10 feet** for non-essential personnel (i.e., driller helper, geologist) when the rig is moving/ in operation.
	1b. FALL: Slip/trip/fall hazards.	1b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
	1c. CONTACT: Crushing from roll-over.	1c Geoprobe should cross all hills/obstructions head on with the mast down to reduce risk of roll-over.
2. Raising tower/derrick of drill rig	**2a. CONTACT:** Overhead hazards.	2a. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for wires, tree limbs, piping, or other structures, that could come in contact with the rig's tower and/or drilling rods or tools. 2a. Maintain a safe distance of 10' from overhead structures.
	2b. CONTACT: Pinch Points/Amputation Points when raising the rig and instability of rig	2b. Inspect the equipment prior to use and avoid pinch/amputation points. 2b. Lower outriggers to ensure stability prior to raising rig tower/derrick. 2b. If the rig needs to be mounted, be sure to use three points of contact.
3. Advancement of drilling equipment and well installation	**3a. CONTACT:** Flying debris	3a. Be aware of and avoid potential lines of fire and wear required PPE such as eye, ear, and hand protection.
	3b. EXPOSURE: Noise and dust.	3b. Wet borehole area with sprayer to minimize dust. 3b. Stand upwind and keep body away from rig. 3b. Dust mask should be worn if conditions warrant. 3b. Wear hearing protection when the drill rig is in operation.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Advancement of drilling equipment and well installation (Continued)	**3a. CONTACT:** Flying debris **3b. EXPOSURE:** Noise and dust. **3c. FALL:** Slip/trip/fall hazards. **3d. CAUGHT:** Limb/extremity pinching; abrasion/crushing. **3e. CONTACT:** Equipment imbalance during advancement of drill equipment. **3f. EXPOSURE:** Inhalation of contamination/vapors. **3g. EXERTION:** Potential for muscle strain/injury while lifting and installing well casings, lifting sand bags, and/or lifting rods.	3c. Contain drill cuttings and drilling water to prevent fall hazards from developing in work area. 3c. See 1b. 3d. Ensure all Emergency Safety Stop buttons function properly. 3d. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 3d. Inspect the equipment prior to use for potential pinch/amputation points. Keep hands away from pinch/amputation points and use of tools is preferable compared to fingers and hands. 3d. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 3d. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3d. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment. 3d. Drillers and helpers will understand and use the "Show Me Your Hands" Policy. 3d. Spinning rods/casing have an **exclusion zone of 10 feet** while in operation. 3e. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 3e. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 3e. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (**minimum exclusion zone of 10 feet**). 3f. Monitor ambient air for dangerous conditions using a calibrated photoionization detector (PID) to periodically monitor the breathing zone of the work area. 3f. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional precautions in accordance with the site specific health and safety plan. 3f. Use a multi-gas meter to monitor ambient air for dangerous conditions (i.e. unsafe levels of carbon monoxide when drilling indoors or the presence of explosive vapors). 3g. Keep back straight and bend at the knees. 3g. Utilize team lifting for objects over 50lbs. 3g. Use mechanical lifting device for odd shaped objects.
4. Remove sample liner.	**4a. EXERTION:** Potential for muscle strain/injury while removing liner from probe rod. **4b. CONTACT:** Pinch points and cuts **4c. EXPOSURE:** Inhalation and/or dermal contact with contaminants.	4a Utilize team lifting for objects over 50lbs. 4a. Use hydraulic liner extruder if available. 4b. Place liner on sturdy surface when opening. 4b. Don cut-resistant gloves and use appropriate liner cutter when opening liners. 4b. Always cut away from the body. 4c. Wear chemical-resistant disposable gloves when handling liners. 4c. See 3e.
5. Decontaminate equipment.	**5a. EXPOSURE/CONTACT**: To contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors). **5b. EXPOSURE:** To chemicals in cleaning solution including ammonia.	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Contain decontamination water so that it does not spill. 5a. Use an absorbent pad to clean spills, if necessary. 5a. Spray equipment from side angle, not straight on, to avoid backsplash. 5a. See 3b. 5b. See 4a. Review SDS to ensure appropriate precautions are taken and understood.

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JOB SAFETY ANALYSIS Ctrl. No. GEN-013	DATE 8/6/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE:	WORK ACTIVITY (Description):
Generic	**Gauging and Sampling**	**Gauging and Sampling**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Brandon Tufano	Staff Geologist	Brian Hobbs	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☒ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Knee pads, Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

42-inch Safety Cones, Caution Tape, Interface Probe and/or Water Level Meter, 20-lb., Type ABC Fire Extinguisher, Buckets. Tools as needed: Socket Wrench, Screw Driver, Crow Bar, Mallet, and Wire Brush.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization to monitoring well(s).	**1a. FALL:** Personal injury from slip/trip/fall due to uneven terrain and/or obstructions.	1a. Inspect pathway and plan for most suitable designated pathway prior to mobilization. 1a. Use established pathways, walk and/or drive on stable, secure ground and avoid steep hills or uneven terrain. 1a. If working near open water with an unguarded edge, wear life vest.
	1b. CONTACT: With traffic/third parties.	1b. Identify potential traffic sources and delineate work area with 42-inch traffic safety cones. Position vehicle to protect against oncoming traffic. Use caution tape to provide a more visible delineation of the work area if necessary. 1b. Wear appropriate PPE including high visibility clothing or reflective vest. 1b. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.
	1c. EXERTION: Muscle strain from lifting equipment	1c. Use proper lifting techniques when handling/moving equipment; bend knees and keep back straight. 4c. Use mechanical assistance or team lifting techniques when equipment is 50 lbs. or heavier. 4c. Make multiple trips to carry equipment.
	1d. EXPOSURE: To biological hazards.	1d. Inspect work area for bees and insects. 1d. Use insect/tick repellent as necessary.
2. Open/close well.	**2a. EXERTION:** Muscle strain.	2a. Use proper lifting techniques; keep back straight, lift with legs and bend knees when reaching to open/close well.
	2b. CAUGHT: Pinch/crush points associated with removing/replacing manholes and working with hand tools.	2b. Wear leather gloves or cut resistant gloves when working with well cover and hand tools. 2b. Use proper tools (ratchet and pry bar for well cover) and inspect before use. 2b. Do not put fingers under well cover.
	2c. CAUGHT: Pinch points associated with placing J-plug back onto PVC pipe.	2c. See 2b. 2c. Keep fingers out of line-of-fire when securing cap.
	2d. EXPOSURE: To potential hazardous vapors.	2d. No open flames/heat sources. 2d. To minimize exposure to vapors, allow well to vent after opening it and before sampling activities begin. 2d. Stand up-wind, if possible, to avoid inhaling vapors.
3. Gauge well.	**3a. CONTACT:** With contamination (e.g. contaminated groundwater).	3a. Wear chemical-resistant disposable gloves (over cut-resistant gloves) and safety glasses when gauging well. 3a. Insert and remove probe slowly to avoid splashing. 3a. Use an absorbent pad to clean probe.
	3b. CONTACT: With traffic.	3b. See 1b.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
4. Purge and sample well	**4a. EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors) and/or sample preservatives.	4a. Open and fill sample jars slowly to avoid splashing and contact with preservatives. 4a. Wear cut-resistant gloves and chemical-resistant disposable gloves when sampling. 4a. Fill sample containers over purge container to avoid spilling water onto the ground. 4a. Use an absorbent pad to clean spills. 4a. When using a bailer to purge a well, pull the bailer slowly from the well to avoid splash hazards. 4a. When sampling or purging the water using a bailer, pour out water slowly to reduce the potential for splash hazards with groundwater. 4a. When using a tubing valve always remove the valve slowly after sample collection to release any pressure and avoid pressurized splash hazards. 4a. When collecting a groundwater sample always point sampling apparatus (tubing, bailer, etc.) away from face and body.
	4b. CONTACT: Personal injury from cuts, abrasions, or punctures by glassware or sharp objects.	4b. To avoid spills or breakage, place sample ware on even surface. 4b. Do not over tighten caps on glass sample ware. 4b. Wear chemical-resistant nitrile disposable gloves over cut-resistant (i.e., Kevlar) gloves when sampling and handling glassware (i.e., VOA vials) or when using cutting tools.
	4c. EXERTION: Muscle strain while carrying equipment.	4c. Use proper lifting techniques when handling/moving equipment, bend knees and keep back straight. 4c. Use mechanical assistance or team lifting techniques when equipment is 50 lbs. or heavier. 4c. Make multiple trips to carry equipment.
	4d. CONTACT: With traffic.	4d. See 1b.
	4e. CONTACT: Pinch points with groundwater pump components (i.e., wheel, line, clamps).	4e. Wear leather gloves when working with groundwater pumps. 4e. Never place hands on or near pinch points such as the wheel, clamps or other moving parts during pump operations. 4e. Use the correct mechanisms, such as a pump reel, to lower pump into well. 4e. Never attempt to manually stop any moving part of equipment including hose reels and/or tubing.
	4f. EXERTION: Muscle strain from repetitive motion of bailing and sampling a well.	4f. See 4c. 4f. Include a stretch break when repetitive motions are part of the task.
5. Management of purge water.	**5a. EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors).	5a. Do not overfill container and pour liquids slowly so that they do not splash. 5a. Properly dispose of used materials/PPE in appropriate container in designated storage area.
	5b. EXERTION: Muscle strain from lifting/carrying and moving containers.	5b. Use proper lifting techniques when lifting / carrying or moving container(s) (see 4c.). 5b. Do not overfill container(s).
6. Decontaminate equipment.	**6a. EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors).	6a. Work on the upwind side, where possible, of decon area. 6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Use an absorbent pad to clean spills.
	6b. CAUGHT: Pinch points associated with handling hand tools	6b. See 2b. 6b. Inspect hand tools for sharp edges before decontaminating.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-014	DATE: 8/6/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):	
Generic	**Drilling**	**Hollow Stem Auger Soil Borings / Well Installation**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Douglas Ferraiolo	Staff Geologist	Brian Hobbs	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☒ GOGGLES: Spoggles required if winds exceed 15 mph. ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed). ☒ SAFETY SHOES: Steel or Composite Toe.	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent long-sleeve shirt or long-sleeve shirt and reflective safety vest.	☒ GLOVES: Leather, Cut-Resistant, and Nitrile. ☒ OTHER: Insect Repellant, Sunscreen (as needed).

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Truck-Mounted Drilling Rig or Track Rig, Saw, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Interface Probe, 20 lb. Type ABC Fire Extinguisher, 42" Cones & Flags, "Work Area" Signs.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ) – All non-essential personnel shall maintain a **10 foot** exclusion zone while drill rig is engaged.

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization / demobilization and establish a work area.	**1a. See Mobilization/ Demobilization JSA GEN-015.**	1a. See Mobilization / Demobilization JSA GEN-015.
2. Raising tower / derrick of drilling rig.	**2a. CONTACT:** Overhead hazards.	2a. Prior to raising the tower / derrick, the area above the drilling rig will be inspected for overhead hazards (wires, tree limbs, piping or other structures) that may be contacted by the rig's tower or drilling rods. 2a. The tower / derrick must not be raised beneath overhead power lines unless approved by the Roux PM. 2a. Maintain a minimum of 10' from all overhead structures. 2a. Do not move the rig while the tower / derrick is raised.
	2b. CONTACT: Amputation / crush points when raising the rig and instability of rig.	2b. Inspect the equipment prior to use and avoid any potential amputation points. 2b. Lower outriggers to ensure stability prior to raising rig tower derrick. Keep feet and body out of the line of fire when lowering out-riggers. 2b. Inspect the set-up location for uneven terrain. Level or avoid area if needed. 2b. If the rig needs to be mounted, be sure to use three points of contact.
3. Advancement of augers for soil boring installation.	**3a. CONTACT:** Equipment imbalance during advancement of drill equipment.	3a. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and / or tip. 3a. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 3a. Drillers will maintain the "Purple Zone" policy surrounding augers to ensure no personnel come into contact with augers while in use. Workers will spray paint a 3' semi-circle surrounding the augers to visually show that no personnel should enter the "Purple Zone" while drilling activities are being conducted. 3a. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (minimum exclusion zone of 20 feet).
	3b. CONTACT: Flying / spraying debris.	3b. Wear all required PPE (especially hand, eye, and ear protection). 3b. Maintain minimum 20' EZ distance when rig is in operation to avoid potential line of fire hazards from flying materials or debris.
	3c. CAUGHT: Limb/extremity amputation, abrasion, and crushing.	3c. Inspect the equipment prior to use for potential pinch points. 3c. Test all emergency shutdown devices prior to drilling. 3c. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 3c. Inspect augers, do not use if auger flight is damaged or bent.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Advancement of augers for soil boring installation (Continued).		3c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3c. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment particularly when installing auger flights and steel override casings. 3c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy. 3c. Spinning augers should have an exclusion zone of 20 feet when in operation.
	3d. FALL: Slip/trip/fall hazards.	3d. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 3d. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 3d. Use established pathways and walk on stable, secure ground. 3d. Use three points of contact when mounting or dismounting the rig. 3d. Remove soil cuttings to avoid a tripping hazard from developing near augers.
	3e. EXPOSURE: Inhalation of contamination / vapors.	3e. Air monitoring using a calibrated photoionization detector (PID) to periodically monitor the breathing zone of the work area. 3e. The Action Level for breathing zone air is five parts per million (sustained) as detected by the PID. 3e. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional appropriate precautions in accordance with the site specific health and safety plan.
	3f. EXPOSURE: Noise and dust.	3f. Wet borehole area with sprayer to minimize dust. Stand upwind and keep body positioned away from rig. 3f. Wear hearing protection while drill rig is operating and / or the noise levels exceed 85 dBA.
	3g. EXERTION: Installing well casings and lifting augers.	3g. Keep back straight and bend at the knees. 3g. Utilize team lifting for objects over 50lbs. 3g. Use mechanical lifting device for odd shaped objects.
4. Installation of well materials.	**4a. CONTACT:** Installing well materials while also pulling up augers. **4b. CAUGHT:** Possible pinch or crush hazard assembling PVC and sending down the borehole. **4c. FALL:** Slip/trip/fall hazards with hand tools and materials. **4d. EXPOSURE:** Potential contamination, harmful vapors, dust, and / or noise. **4e. EXERTION:** Lifting heavy bags of materials to backfill borehole.	4a. Potential contact with augers during installation of well materials. 4a. Keep distance from augers and do not place any materials while augers are in motion. 4b. Keep all body parts out of potential pinch points while placing PVC together and sending down borehole. 4c. See 3d. 4d. See 3e and 3f. 4d. Stand upwind to avoid exposure to dust generated from packing materials. 4e. Ergonomic hazard lifting bags of sand and bentonite while packing the well.
5. Cleaning the auger flights	**5a. CONTACT:** Cuts/scrapes or puncture wound from contacting auger.	5a. Follow "Show Me Your Hands" Procedure and make sure auger is out of gear before contacting auger with tool or hand. 5a. Pull cleaning tool across your body with handle away from body; do not push toward the auger. 5a. Do not clean more than ¾ turn around the auger at a time. 5a. Wear cut resistant and leather gloves. 5a. Always use two hands to operate cleaning tool. 5a. Inspect tool before use and remove from service if handle or metal are cracked/fatigued. 5a. Stand out of the line of fire.
6. Decontaminate equipment.	**6a. EXPOSURE / CONTACT:** To contamination (e.g., contaminated groundwater, vapors). **6b. EXPOSURE**: To chemicals in cleaning solution (including ammonia).	6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Contain decontamination water so that it does not spill. 6a. Use an absorbent pad to clean spills, if necessary. 6b. See 3e. Wear all appropriate PPE and stand upwind of any exposed cleaning solutions.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-019	DATE: 8/6/2018	☐NEW ☒REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Site Recon**	**Site Walk and Inspection**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Sara Barrientos	Staff Geologist	Brian Hobbs	Corporate Health and Safety Manager
		Joe Duminuco	Vice President

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: ear plugs as necessary ☒ SAFETY SHOES: Steel or composite toed	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: High-visibility vest or high-vis outerwear	☒ GLOVES: Leather/cut-resistant/chemical resistant ☒ OTHER: Tyvek and rubber boots as necessary, dust mask as necessary

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Site map, emergency contact list, documentation of urgent care/hospital routes and / or guide familiar with Site, operating cell phone or walkie-talkie if Site allows.

Commitment to Safety – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE (EZ): A minimum 10' exclusion zone will be maintained around equipment.

SITE SECURITY: Prior to site inspection verify appropriate method to address Site Security concerns as it relates to potential criminal activity, homeless population, and/or isolation concerns. Work with the Project Principal and/or Project Manager to address appropriately.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Check in with Site contact.	**1a. CONTACT/EXPOSURE/FALL:** Personal injury caused by lack of site specific hazards.	1a. Inquire about hazards and other activities taking place at the Site. 1a. Inform Site contact of work scope, timeline and location(s). 1a. Discuss emergency evacuation procedures and muster points with Site contact.
2. Traversing the Site	**2a. CONTACT:** Property damage and personal injury caused by obstructions/vehicles or unauthorized personnel at remote Sites.	2a. All equipment must be stowed and secured prior to moving. 2a. Maintain speed limit as posted on-site. 2a. When possible drive on established roadways. 2a. Yield to all pedestrians. 2a. Use pull-through spots or back into parking spots. 2a. Don high visibility clothing/safety vest. If working at remote Site, add orange accessories during hunting season.
	2b. FALL: Uneven terrain and weather conditions. Overgrown shrubs and vines. Equipment in the work zone.	2b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 2b. When possible, use established pathways and walk on stable, secure ground. 2b. Communicate traversing hazards with others.
	2c. OVEREXERTION: Muscle strain while carrying equipment.	2c. When carrying equipment to/from work area, use proper lifting techniques; keep back straight, lift with legs, keep load close to body, never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Use mechanical assistance or make multiple trips to carry equipment.
	2d. EXPOSURE: Biological hazards – ticks; bees/wasps; poison ivy; insects; (Ticks are most active any time the temperature is above freezing, typically from March to November.)	2d. Inspect area to avoid contact with biological hazards. 2d. Ticks: • Treat outer clothing including pants, shirts, socks, boots and hats the evening before with Permethrin (allowing at least two hours before use). • Apply DEET to exposed skin before travelling to the Site and reapply after two hours. • Check for ticks during and after work. 2d. Bees: • Use bee spray as appropriate to deter/eliminate bees. • Protect exposed skin with insect repellent. 2d. Poison Ivy:

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	2e. EXPOSURE: Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	• Identify areas of poison ivy and spray with weed killer. Don Tyvek and rubber boots while traversing poison ivy areas. • If skin contacts poison ivy, wash skin thoroughly with soap and water. 2e. Wear sunscreen with SPF 15 or greater on exposed skin whenever 30 minutes or more of sun exposure is expected. 2e. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 2e. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 2e. Wear appropriate rain gear as needed. 2e. Take frequent breaks if tired, wet, or cold/hot. Drink water. 2e. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
3. Walking near heavy equipment and machinery.	**3a. CONTACT:** Personal injury from Site and roadway traffic. Personal injury from flying debris **3b. OVEREXERTION:** Personal injury from lifting/moving/rotating equipment. **3c. EXPOSURE:** Hearing damage from noise generating equipment/processes. Inhalation/exposure to hazardous vapors and or dust. **3d. EXPOSURE:** Working in a remote area.	3a. See 2a. 3a. Maintain an exclusion zone of at least 10'-25' feet from all engaged equipment. 3a. Keep body parts out of the line of fire of pinch points. 3a. Wear appropriate PPE always. 3b. See 2c. 3c. Wear hearing protection if >85 dBA. (i.e. noise levels which require you to raise your voice to communicate) 3c. Always wear leather gloves when handling any tools or equipment. 3c. Always wear appropriate PPE based off chemicals present. 3d. Use the "buddy system" whenever possible. If working alone, contact PM upon arrival/departure, as well as during work activities prior to commencing work if applicable. 3d. Always carry a communication (i.e., cell phone, walkie-talkie) or directional (i.e., map, compass, etc.) device when traversing remote areas.
4. Working in adverse weather conditions.	**4a. EXPOSURE:** Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	4a. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 4a. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 4a. Wear appropriate rain gear as needed. 4a. Take frequent breaks if tired, wet, or cold/hot. Drink water. 4a. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
5. Departing Site.	**5a. EXPOSURE:** Exposure to unnecessary hazards should personnel believe Roux is on-Site during an emergency and conduct a search.	5a. Sign out or notify Site contact and Roux Project Manager of your departure.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-021	DATE: 8/6/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE	WORK ACTIVITY (Description)	
GENERIC	**Gauging and Sampling**	**Soil Vapor Sampling (Permanent Monitoring Points)**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Jeff Wills	Project Hydrogeologist	Brian Hobbs	Corporate Health and Safety Manager
Julie Moriarity	Project Scientist		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Cut-resistant & Nitriles
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☒ OTHER: Bug Spray, Sun Screen, Knee Pads or kneeling pad
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	
☒ SAFETY GLASSES	☒ SAFETY SHOES: Steel-toe boots		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

9/16" Socket and Wrench, Non-Toxic Clay, Teflon-Lined Tubing, Masterflex Tubing, Air Pump with Low Flow, Dry Cal, Enclosure (Bucket with 2 holes), Helium Gas Canister, Summa Canisters and Flow Controllers, MultiRae Photo Ionization Detector (PID), Helium Detector, Tubing Cutter, 42-inch Safety Cones, Caution Tape or Retractable Cone Bars

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): A 5-foot exclusion zone will be maintained for non-essential personnel.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Define and secure work area.	**1a. FALL:** Potential tripping hazards.	1a. Ensure work area is secure and inform others (third party) of work activity. 1a. Remove tripping hazards and inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment.
	1b. CONTACT: Potential contact with moving vehicles or pedestrians.	1b. If working alongside roads, look both ways before entering roadways, face traffic, and utilize work vehicle to protect employees. 1b. Delineate work area (including vehicles) with traffic safety cones and caution tape or retractable cone bars. 1b. Maintain a 5-foot exclusion zone. 1b. Wear high visibility clothing or reflective safety vest.
	1c. EXERTION: Muscle strain while lifting and carrying equipment.	1c. When carrying equipment to/from work area, keep back straight, lift with legs, keep load close to body, never reach with a load. Ensure that loads are balanced. Use mechanical assistance/make multiple trips to carry equipment.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Remove well cover / close well cover.	**2a. CONTACT/CAUGHT:** Pinch points and scrapes associated with hand tools and well covers. **2b. FALL:** Potential tripping hazards associated with installing bolts. **2c. EXERTION:** Physical exertion to remove bolts that were over torqued or stripped.	2a. Keep hands away from pinch points. 2a. Use hand tools with extensions to remove and replace well covers. 2a. Wear cut-resistant gloves. 2a. Use knee pads or kneeling pad when repetitive kneeling on rough ground is anticipated. 2b. Place security bolts in secure location so not to create tripping hazards. Replace security bolts so that they fit flush with monitoring well covers. 2c. Replace any security bolts that show signs of stripping. Do not over tighten. 2c. Use body positioning and bending techniques that minimize muscle strain; keep back straight, bend at the knees. 2c. See 2a.
3. Screen vapor point with PID.	**3a. FALL:** Potential tripping hazards associated with equipment. **3b. EXPOSURE:** Inhalation of soil vapor	3a. Place equipment in one area close to the sampling location. 3b. Identify area where equipment is to be stored within the work area (away from main walking path). 3a. Don't leave equipment on the ground. Return equipment to storage area between uses. 3b. Replace brass caps immediately upon completion to avoid soil vapors migrating to the surface through sample tubing. 3b. Stand upwind of sample point during screening activities.
4. Remove / replace brass caps at the end of the sam`ple tubing.	**4a. CONTACT:** Pinch points associated with hand tools and brass caps. **4b. EXPOSURE:** Potential pathway for vapors to migrate to land surface.	4a. Use wrench to remove and replace brass caps. 4a. Wear cut-resistant gloves to protect against pinch points and scrapes. 4b. See 3b. 4b. Stand up wind of sample point location.
5. Set up soil vapor sampling equipment and calibration of meters.	**5a. FALL:** Potential tripping hazards associated with equipment and tubing.5b. **5b. CONTACT:** Pinch points associated with handling equipment. **5c. EXPOSURE:** Inhalation of calibration gas and helium.	5a. See 3a. 5a. Keep tubing slack to a minimum and locate the summa canister as close to the sampling location as possible. 5a. Avoid stepping over equipment and tubing. 5b. Do not place fingers/hands under sampling equipment. 5b. Make multiple trips when unloading equipment in work area. 5b. Wear cut-resistant gloves to protect against pinch points while handling sampling equipment. 5c. Review SDS for each type of calibration gas used before calibrating. 5c. Calibrate meters in a well-ventilated area and keep air flow regulator away from face. 5c. Close valve on canisters after use to avoid inhalation of excess helium or calibration gas. 5c. Stand up wind of bucket during helium tracer gas test.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – Electricity, pressure, tension/compression, torque.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
6. Cleaning Work Area.	**6a. FALL:** Potential tripping hazards associated with equipment and tubing.	6a. See 3a. 6a. See 3b.
	6b. CONTACT: Storing and transport of equipment in car.	6b. Ensure that equipment is placed securely in the vehicle. Do not stack equipment on top of each other. Secure equipment so that it will not slide while being transported. 6b. Wear cut-resistant gloves while handling/loading equipment.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – Electricity, pressure, tension/compression, torque.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

APPENDIX B

SDSs for Chemicals Used

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

1 Identification of the substance/mixture and of the supplier

1.1 Product identifier

Trade Name: Alconox
Synonyms:
Product number: Alconox

1.2 Application of the substance / the mixture : Cleaning material/Detergent

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer
Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
1-914-948-4040

Supplier
Not Applicable

Emergency telephone number:
ChemTel Inc
North America: 1-800-255-3924
International: 01-813-248-0585

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

Hazard-determining components of labeling:
Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate

2.2 Label elements:

Skin irritation, category 2.
Eye irritation, category 2A.

Hazard pictograms:

Signal word: Warning

Hazard statements:
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Additional information: None.

Hazard description

Hazards Not Otherwise Classified (HNOC): None

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

3 Composition/information on ingredients

3.1 Chemical characterization : None

3.2 Description : None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	12-28
CAS number: 68081-81-2	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	8-22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	2-16

3.4 Additional Information : None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

Seek medical attention if irritation, discomfort, or vomiting persists.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

4.2 Most important symptoms and effects, both acute and delayed

None

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information.

5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents : None

5.2 Special hazards arising from the substance or mixture :

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.
Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.
Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures :

Ensure adequate ventilation.
Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.
Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None

7 Handling and storage

7.1 Precautions for safe handling :

Avoid breathing mist or vapor.
Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

8 Exposure controls/personal protection

8.1 Control parameters :

7722-88-5, Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3.

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection.

General hygienic measures:

Wash hands before breaks and at the end of work.
Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

Appearance (physical state, color):	White and cream colored flakes - powder	**Explosion limit lower:** **Explosion limit upper:**	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	**Vapor pressure at 20°C:**	Not determined or not available.
Odor threshold:	Not determined or not available.	**Vapor density:**	Not determined or not available.
pH-value:	9.5 (aqueous solution)	**Relative density:**	Not determined or not available.
Melting/Freezing point:	Not determined or not available.	**Solubilities:**	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	**Partition coefficient (n-octanol/water):**	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	**Auto/Self-ignition temperature:**	Not determined or not available.
Evaporation rate:	Not determined or not available.	**Decomposition temperature:**	Not determined or not available.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Flammability (solid, gaseous):	Not determined or not available.	**Viscosity**:	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	Not determined or not available.		

10 Stability and reactivity

10.1 Reactivity : None

10.2 Chemical stability : None

10.3 Possibility hazardous reactions : None

10.4 Conditions to avoid : None

10.5 Incompatible materials : None

10.6 Hazardous decomposition products : None

11 Toxicological information

11.1 Information on toxicological effects :

Acute Toxicity:

Oral:

: LD50 > 5000 mg/kg oral rat - Product .

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Sodium Alkylbenzene Sulfonate: Causes skin irritation. .

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation .

Tetrasodium Pyrophosphate: Rabbit - Risk of serious damage to eyes .

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours.
Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.
Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

PBT: No additional information.

vPvB: No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1 UN Number: None
ADR, ADN, DOT, IMDG, IATA

14.2 UN Proper shipping name: None
ADR, ADN, DOT, IMDG, IATA

14.3 Transport hazard classes:
ADR, ADN, DOT, IMDG, IATA

Class: None
Label: None
LTD. QTY: None

US DOT
Limited Quantity Exception: None

Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Non Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Comments: None	**Comments:** None
14.4 Packing group: ADR, ADN, DOT, IMDG, IATA	None
14.5 Environmental hazards :	None
14.6 Special precautions for user:	None
Danger code (Kemler):	None
EMS number:	None
Segregation groups:	None

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

14.8 Transport/Additional information:

Transport category:	None
Tunnel restriction code:	None
UN "Model Regulation":	None

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

North American

SARA

Section 313 (specific toxic chemical listings): None of the ingredients are listed.
Section 302 (extremely hazardous substances): None of the ingredients are listed.

CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable

Spill Quantity: None of the ingredients are listed.

TSCA (Toxic Substances Control Act):

Inventory: All ingredients are listed.
Rules and Orders: Not applicable.

Proposition 65 (California):

Chemicals known to cause cancer: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed.

Chemicals known to cause developmental toxicity: None of the ingredients are listed.

Canadian

Canadian Domestic Substances List (DSL):
All ingredients are listed.

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

Germany MAK: Not classified.

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

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 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.

NFPA: 1-0-0

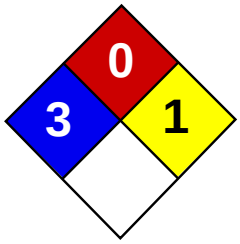
Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015 **Revision** : 12.10.2015

Trade Name: Alconox

HMIS: 1-0-0



Material Safety Data Sheet
Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:
108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

Melting Point:
-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:
1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:
Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

Special Remarks on Corrosivity:

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (fetoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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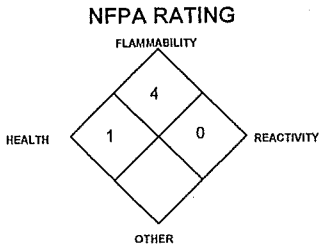
MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards



PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS:	**ISOBUTYLENE - C_4H_8** Document Number: Isobutylene
PRODUCT USE:	For general analytical/synthetic chemical uses.
SUPPLIER/MANUFACTURER'S NAME: ADDRESS:	MESA Specialty Gases & Equipment 3619 Pendleton Avenue, Suite C Santa Ana, CA 92704
BUSINESS PHONE: EMERGENCY PHONE:	1-714-434-7102 INFOTRAC: 1-800-535-5053
DATE OF PREPARATION:	May 10, 1999

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
Isobutylene	115-11-7	> 99.0%	There are no specific exposure limits for Isobutylene. Isobutylene is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Maximum Impurities		< 1.0%	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established C = Ceiling Limit See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Isobutylene is a colorless, liquefied, flammable gas with an unpleasant odor similar to burning coal. The liquefied gas rapidly turns into a gas at standard atmospheric temperatures and pressures. Isobutylene is an asphyxiant and presents a significant health hazard by displacing the oxygen in the atmosphere. Rapid evaporation of liquid from the cylinder may cause frostbite. Both the liquid and gas pose a serious fire hazard when accidentally released. The gas is heavier than air and may travel to a source of ignition and flash back to a leak or open container. Flame or high temperature impinging on a localized area of a cylinder of Isobutylene can cause the cylinder to rupture without activating the cylinder's relief devices. Provide adequate fire protection during emergency response situations.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of overexposure, death may occur. Isobutylene also has some degree of anesthetic action and can be mildly irritating to the mucous membranes. The effects associated with various levels of oxygen are as follows:

CONCENTRATION	SYMPTOMS OF EXPOSURE
12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea and vomiting, collapse or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

OTHER POTENTIAL HEALTH EFFECTS: Contact with liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after such contact can quickly subside.

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	1
FLAMMABILITY	(RED)	4
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		B

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

For routine industrial applications

See Section 16 for Definition of Ratings

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Overexposure to Isobutylene may cause the following health effects:

ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness, and nausea. At high concentrations, unconsciousness or death may occur. Contact with liquefied gas or rapidly expanding gases may cause frostbite.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to Isobutylene.

TARGET ORGANS: Respiratory system.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO ISOBUTYLENE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations.

4. FIRST-AID MEASURES (Continued)

Remove victim(s) to fresh air as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

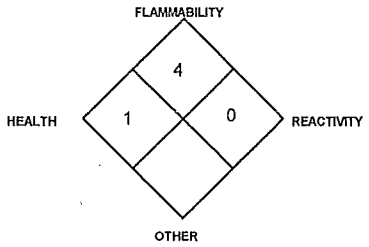
Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

FLASH POINT (Closed Cup): -10°C (< 14°F)
AUTOIGNITION TEMPERATURE: 465°C (869°F)
FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): 1.8%
Upper (UEL): 9.6%

NFPA RATING



See Section 16 for Definition of Ratings

FIRE EXTINGUISHING MATERIALS: Extinguish Isobutylene fires by shutting off the source of the gas. Use water spray or a foam agent to cool fire-exposed containers, structures, and equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this material may ignite and produce toxic gases, including carbon monoxide and carbon dioxide.

DANGER! Fires impinging (direct flame) on the outside surface of unprotected pressure storage vessels of Isobutylene can be very dangerous. Direct flame exposure on the cylinder wall can cause an explosion either by BLEVE (Boiling Liquid Expanding Vapor Explosion), or by exothermic decomposition. This is a catastrophic failure of the vessel releasing the contents into a massive fireball and explosion. The resulting fire and explosion can result in severe equipment damage and personnel injury or death over a large area around the vessel. For massive fires in large areas, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and allow fire to burn.

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Static discharge may cause Isobutylene to ignite explosively if released.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. The best fire-fighting technique may be simply to let the burning gas escape from the pressurized cylinder, tank car, or pipeline. Stop the leak before extinguishing fire. If the fire is extinguished before the leak is sealed, the leaking gas could explosively re-ignite without warning and cause extensive damage, injury, or fatality. In this case, increase ventilation (in enclosed areas) to prevent flammable or explosive mixture formation. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Because of the potential for a BLEVE, evacuation of non-emergency personnel is essential. If water is not available for cooling or protection of vessel exposures, evacuate the area. Refer to the North American Emergency Response Guidebook for additional information. Other information for pre-planning can be found in the American Petroleum Institute Publications 2510 and 2510A.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. Adequate fire protection must be provided. Minimum Personal Protective Equipment should be **Level B: fire-retardant protective clothing, gloves resistant to tears, and Self-Contained Breathing Apparatus.**

Use only non-sparking tools and equipment. Locate and seal the source of the leaking gas. Protect personnel attempting the shut off with water spray. Allow the gas to dissipate. Monitor the surrounding area for combustible gas levels and oxygen. Combustible gas concentration must be below 10% of the LEL (LEL = 1.8%) prior to entry. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in place or remove it to a safe area and allow the gas to be released there.

THIS IS AN EXTREMELY FLAMMABLE GAS. Protection of all personnel and the area must be maintained.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting Isobutylene IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Isobutylene could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post "No Smoking or Open Flames" signs in storage or use areas.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from oxidizers such as oxygen, chlorine, or fluorine. Use a check valve or trap in the discharge line to prevent hazardous backflow. Post "No Smoking or Open Flame" signs in storage and use areas. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. Electrical equipment should be non-sparking or explosion proof. The following rules are applicable to situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand truck. Do not drag, slide, or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap, if provided, in place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap, if provided. Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with Isobutylene. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 "*Oxygen Deficient Atmospheres*".

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., nitrogen) before attempting repairs.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents Isobutylene dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the presence of potentially explosive air-gas mixtures and level of oxygen.

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Maintain level of gas below the level listed in Section 2 (Composition and Information on Ingredients). Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Isobutylene. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

EYE PROTECTION: Splash goggles or safety glasses, for protection from rapidly expanding gases and splashes of liquid Isobutylene.

HAND PROTECTION: Wear gloves resistant to tears when handling cylinders of Isobutylene. Use low-temperature protective gloves (e.g., Kevlar) when working with containers of liquid Isobutylene.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well as fire retardant items.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY @ 21.1°C (70°F): 2.396 kg/m^3 (0.1496 lb/ft^3)
SPECIFIC GRAVITY (air = 1): 1.997
SOLUBILITY IN WATER: Insoluble.
EVAPORATION RATE (nBuAc = 1): Not applicable.
ODOR THRESHOLD: Not established.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.
pH: Not applicable.
FREEZING POINT: -140°C (-220.6°F)
BOILING POINT @ 1 atm: -6.9°C (19.6°F)
EXPANSION RATIO: Not applicable
VAPOR PRESSURE (psia): 39
SPECIFIC VOLUME (ft^3/lb): 6.7

APPEARANCE AND COLOR: Colorless gas with the unpleasant odor of burning coal. The liquid is also colorless and has the same unpleasant odor of burning coal.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no distinct warning properties. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: When ignited in the presence of oxygen, this gas will burn to produce carbon monoxide and carbon dioxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers (e.g., chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials and exposure to heat, sparks, and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture or burst.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following information is for pure Isobutylene.

ISOBUTYLENE:
LC_{50} (rat, inhalation) = 620 g/m^3/4 hours
LC_{50} (mouse, inhalation) = 415 g/m^3/2 hours

SUSPECTED CANCER AGENT: Isobutylene is not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore is neither considered to be nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Isobutylene may be mildly irritating to the mucous membranes. In addition, contact with rapidly expanding gases can cause frostbite to exposed tissue.

SENSITIZATION TO THE PRODUCT: Isobutylene is not known to cause sensitization in humans.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Isobutylene on the human reproductive system.

Mutagenicity: No mutagenic effects have been described for Isobutylene.
Embryotoxicity: No embryotoxic effects have been described for Isobutylene.
Teratogenicity: No teratogenic effects have been described for Isobutylene.
Reproductive Toxicity: No reproductive toxicity effects have been described for Isobutylene.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by overexposure to Isobutylene.

11. TOXICOLOGICAL INFORMATION (Continued)

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary. Treat symptoms and eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for Isobutylene.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: This gas will be dissipated rapidly in well-ventilated areas.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to oxygen-deficient environments. No adverse effect is anticipated to occur to plant life, except for frost produced in the presence of rapidly expanding gases. See Section 11, Toxicological Information, for additional information on effects on animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on the effects of Isobutylene on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to MESA Specialty Gases & Equipment Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

For Isobutylene Gas:

PROPER SHIPPING NAME:	Isobutylene
HAZARD CLASS NUMBER and DESCRIPTION:	2.1 (Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1055
PACKING GROUP:	Not Applicable
DOT LABEL(S) REQUIRED:	Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 115

Alternate Description:

PROPER SHIPPING NAME:	Petroleum gases, liquefied
HAZARD CLASS NUMBER and DESCRIPTION:	2.1 (Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1075
PACKING GROUP:	Not Applicable
DOT LABEL(S) REQUIRED:	Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 115

MARINE POLLUTANT: Isobutylene is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Isobutylene is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDSL INVENTORY STATUS: Isobutylene is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Isobutylene is listed on the TSCA Inventory.

15. REGULATORY INFORMATION (Continued)

OTHER U.S. FEDERAL REGULATIONS: Isobutylene is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 lb. Depending on specific operations involving the use of Isobutylene, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Isobutylene is not listed in Appendix A; however, any process that involves a flammable gas on-site, in one location, in quantities of 10,000 lb (4,553 kg) or greater is covered under this regulation unless it is used as a fuel.

U.S. STATE REGULATORY INFORMATION: Isobutylene is covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Liquefied Petroleum Gas.
California - Permissible Exposure Limits for Chemical Contaminants: Liquefied Petroleum Gas.
Florida - Substance List: Isobutylene.
Illinois - Toxic Substance List: No.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Isobutylene.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: Liquefied Petroleum Gas.
Missouri - Employer Information/Toxic Substance List: No.
New Jersey - Right to Know Hazardous Substance List: Isobutylene.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Isobutylene.
Rhode Island - Hazardous Substance List: Liquefied Petroleum Gas.
Texas - Hazardous Substance List: Liquefied Petroleum Gas.
West Virginia - Hazardous Substance List: Liquefied Petroleum Gas.
Wisconsin - Toxic and Hazardous Substances: Liquefied Petroleum Gas.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Isobutylene is not on the California Proposition 65 lists.

LABELING:

DANGER:

FLAMMABLE LIQUID AND GAS UNDER PRESSURE.
CAN FORM EXPLOSIVE MIXTURES WITH AIR.
MAY CAUSE FROSTBITE.

Keep away from heat, flames, and sparks.
Store and use with adequate ventilation.
Cylinder temperature should not exceed 52°C (125°F).
Do not get liquid in eyes, on skin, or clothing.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

FIRST AID:

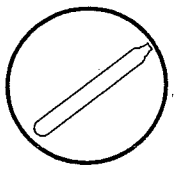
IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

IN CASE OF FROSTBITE, obtain immediate medical attention.

DO NOT REMOVE THIS PRODUCT LABEL.

CANADIAN WHMIS SYMBOLS:

Class A: Compressed Gas
Class B1: Flammable Gas



16. OTHER INFORMATION

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. MESA Specialty Gases & Equipment assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, MESA Specialty Gases & Equipment assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:
ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.
OSHA - U.S. Occupational Safety and Health Administration. **PEL** - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.
IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration **(OSHA)**. NIOSH issues exposure guidelines called Recommended Exposure Levels **(RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).
NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure causes death or major residual injury).

NATIONAL FIRE PROTECTION ASSOCIATION (Continued): Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:
Much of the information related to fire and explosion is derived from the National Fire Protection Association **(NFPA)**. Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:
Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo, LDLo**, and **LDo**, or **TC, TCo, LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:
This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations.

Manufactured for

INDUSTRIAL SCIENTIFIC

CORPORATION

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MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas: Oxygen, 0.0015-23.5%; Propane, 0-1.1%; n-Pentane, 0-0.75%; n-Hexane; 0-0.48%; Carbon Monoxide, 0.0005-1.0%; Hydrogen Sulfide, 0.001-0.025%

NOTE: MIXTURES COMPRISED OF AN AIR BALANCE GAS CONTAIN BETWEEN 19.5-23.5% OXYGEN.

SYNONYMS: Not Applicable

CHEMICAL FAMILY NAME: Not Applicable

FORMULA: Not Applicable

Document Number: 50016 (Replaces ISC MSDS No.1810-2187, 1810-2343, 1810-3366, 1810-3937 1810-7219, 1810-7599, 1810-6179)

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:	Calibration of Monitoring and Research Equipment
SUPPLIER/MANUFACTURER'S NAME:	CALGAZ
ADDRESS:	821 Chesapeake Drive Cambridge, MD 21613
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	1-410-228-6400
General MSDS Information	1-713/868-0440
Fax on Demand:	1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIHTLV		OSHA		IDLH	OTHER
			TWA ppm	STEL ppm	TWA ppm	STEL ppm	ppm	ppm
Oxygen	7782-44-7	0.0015 - 23.5%	There are no specific exposure limits for Oxygen. Oxygen levels should be maintained above 19.5%.					
Propane	74-98-6	0 - 1.1%	2500	NE	1000	NE	2100	NIOSH REL: 1000 DFG MAK: 1000 ppm
n-Pentane	109-66-0	0 - 0.75%	600	750	1000 600 (Vacated 1989 PEL)	750 (Vacated 1989 PEL)	1500	NIOSH REL: TWA = 120 STEL = 610 (ceiling) 15 minutes DFG MAKs: TWA =1000 PEAK = 2•MAK, 60 min., momentary value
n-Hexane	110-54-3	0 - 0.48%	50	NE	500 50 (Vacated 1989 PEL)	NE	1100	NIOSH REL: 50 DFG MAK: 50
Hydrogen Sulfide	7783-06-4	0.001-0.025 %	10 NIC = 5	15 NIC = 5	10 (Vacated 1989 PEL)	20 (ceiling), 50 (10 min. peak, once per shift) 15 (Vacated 1989 PEL)	100	NIOSH REL: STEL = 10 (ceiling), 10 minutes DFG MAKs: TWA = 10 PEAK = 2•MAK, 10 min., momentary value
Carbon Monoxide	630-08-0	0.0005 - 1.0%	25	NE	50 35 (Vacated 1989 PEL)	200 (ceiling) (Vacated 1989 PEL)	1200	NIOSH RELs: TWA = 35 STEL = 200 ceiling DFG MAKs: TWA = 30 PEAK = 2•MAK, 15 min., average value, 1 hr interval DFG MAK Pregnancy Risk Classification: B
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established. NIC = Notice of Intended Change See Section 16 for Definitions of Terms Used.

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This gas mixture has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This gas mixture is a colorless gas which has a rotten-egg odor (due to the presence of Hydrogen Sulfide). The odor cannot be relied on as an adequate warning of the presence of this gas mixture, because olfactory fatigue occurs after over-exposure to Hydrogen Sulfide. Hydrogen Sulfide and Carbon Monoxide (another component of this gas mixture) are toxic to humans in relatively low concentrations. Over-exposure to this gas mixture can cause skin or eye irritation, nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. The Propane, n-Pentane, and n-Hexane components can cause anesthetic or peripheral neuropathy effects. Additionally, releases of this gas mixture may produce oxygen-deficient atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this gas mixture is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this gas mixture, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. A significant health hazard associated with this gas mixture is the potential of inhalation of Hydrogen Sulfide, a component of this gas mixture. Such over-exposures may occur if this gas mixture is used in a confined space or other poorly-ventilated area. Over-exposures to Hydrogen Sulfide can cause dizziness, headache, and nausea. Exposure to this component can result in respiratory arrest, coma, or unconsciousness. Continuous inhalation of low concentrations of Hydrogen Sulfide may cause olfactory fatigue, so that the odor is no longer an effective warning of the presence of this gas. A summary of exposure concentrations and observed effects are as follows

CONCENTRATION OF HYDROGEN SULFIDE	OBSERVED EFFECT
0.3-30 ppm	Odor is obvious and unpleasant.
50 ppm	Eye irritation. Dryness and irritation of nose, throat.
Slightly higher than 50 ppm	Irritation of the respiratory system.
100-150 ppm	Temporary loss of smell.
200-250 ppm	Headache, vomiting nausea. Prolonged exposure may lead to lung damage. Exposures of 4-8 hours can be fatal.
300-500	Swifter onset of symptoms. Death occurs in 1-4 hours.
500 ppm	Headache, excitement, staggering, and stomach ache after brief exposure. Death occurs within 0.5 - 1 hour of exposure.
> 600 ppm	Rapid onset of unconsciousness, coma, death.
> 1000 ppm	Immediate respiratory arrest.
NOTE:	This gas mixture contains a maximum of 250 ppm Hydrogen Sulfide. The higher concentration values here are presented to delineate the complete health effects which have been observed for humans after exposure to Hydrogen Sulfide.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	3
FLAMMABILITY HAZARD	(RED)	0
PHYSICAL HAZARD	(YELLOW)	0

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
See Section 8			

For Routine Industrial Use and Handling Applications

Inhalation over-exposures to atmospheres containing more than the Threshold Limit Value of Carbon Monoxide (25 ppm), another component of this gas mixture, can result in serious health consequences. Carbon Monoxide is classified as a chemical asphyxiant, producing a toxic action by combining with the hemoglobin of the blood and replacing the available oxygen. Through this replacement, the body is deprived of the required oxygen, and asphyxiation occurs.

Since the affinity of Carbon Monoxide for hemoglobin is about 200-300 times that of oxygen, only a small amount of Carbon Monoxide will cause a toxic reaction to occur. Carbon Monoxide exposures in excess of 50 ppm will produce symptoms of poisoning if breathed for a sufficiently long time. If this gas mixture is released in a small, poorly ventilated area (i.e. an enclosed or confined space), symptoms which may develop include the following:

CONCENTRATION OF CARBON MONOXIDE	OBSERVED EFFECT
All exposure levels: ..	Over-exposure to Carbon Monoxide can be indicated by the lips and fingernails turning bright red.
200 ppm:	Slight symptoms (i.e. headache) after several hours of exposure.
400 ppm:	Headache and discomfort experienced within 2-3 hours of exposure.
1,000 -2000 ppm:	Within 30 minutes, slight palpitations of the heart occurs. Within 1.5 hours, there is a tendency to stagger.
200-2500 ppm:	Within 2 hours, there is mental confusion, headaches, and nausea. Unconsciousness within 30 minutes.
> 2500 ppm:	Potential for collapse and death before warning symptoms.

Another hazard associated with this gas mixture is the potential for anesthetic and peripheral neuropathy effects after inhalation over-exposures to the Propane, n-Pentane and n-Hexane components of this gas mixture. Specific human over-exposure data are available for n-Pentane and n-Hexane, as follows:

CONCENTRATION OF n-PENTANE	OBSERVED EFFECT
Brief (10 minute) up to 5,000 ppm:	No symptoms.
Higher than 5,000 ppm:	Exhilaration, dizziness and headache can occur.
Long term:	Can cause chronic neurological disorder causing damage to the nerves in the hands and feet (peripheral neuropathy)

CONCENTRATION OF n-HEXANE	OBSERVED EFFECT
Brief (10 minute) at 1,500 ppm:	Irritation of the respiratory tract, nausea and headache.
5000 ppm:	Dizziness and drowsiness can occur.
Long term at 500 ppm:	Can affect the nerves in the arms and legs. Effects include numbing or tingling sensations in the fingers and toes, tiredness, muscle weakness, cramps and spasms in the leg, difficulty in holding objects or walking, abdominal pains, loss of appetite, weight loss. More serious exposures can cause damage to the nerves in the hands and feet (peripheral neuropathy).
Eyes and Vision:	Abnormal color perception and pigment changes in the eyes have been reported among industrial workers exposed to 423-1280 ppm for 5 years or more.
Blood Cells:	Mild forms of anemia have also been associated with exposure to hexane. These are of temporary nature.

Additionally, if mixtures of this gas mixture contain less than 19.5% Oxygen and are released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN	OBSERVED EFFECT
12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

SKIN and EYE CONTACT: The Hydrogen Sulfide component of this gas mixture may be irritating to the skin. Inflammation and irritation of the eyes can occur at very low airborne concentration of Hydrogen Sulfide (less than 10 ppm). Exposure over several hours may result in “gas eyes” or “sore eyes” with symptoms of scratchiness, irritation, tearing and burning. Above 50 ppm of Hydrogen Sulfide, there is an intense tearing, blurring of vision, and pain when looking at light. Over-exposed individuals may see rings around bright lights. Most symptoms disappear when exposure ceases. However, in serious cases, the eye can be permanently damaged.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this gas mixture, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. However, the Hydrogen Sulfide and Carbon Monoxide components of this gas mixture are toxic to humans. Over-exposure to this gas mixture can cause nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. Due to the presence of Hydrogen Sulfide, over-exposures to this gas mixture can also irritate the skin and eyes; severe eye contamination can result in blindness.

Inhalation over-exposures to Propane, n-Pentane, and n-Hexane can cause anesthetic effects and motor neuropathy (i.e. pain and tingling in feet and hands).

3. HAZARD IDENTIFICATION (Continued)

CHRONIC: Abnormal color perception and pigment changes in the eyes have been reported among persons exposed to 420 -1300 ppm of n-Hexane for five years. Additionally, long-term exposure to low levels of n-Hexane or n-Pentane can affect the nerves in the arms and legs. Effects include numbing or tingling sensation, tiredness, cramps, spasms in legs, difficulty holding objects or walking, loss of appetite and weight loss. Pentane isomers, such as n-Pentane, and Propane can cause sensitization of the heart to epinephrine. Refer to Section 11 (Toxicology Information) for additional information on the components of this gas mixture.

TARGET ORGANS: ACUTE: Respiratory system, blood system, central nervous system, cardiovascular system. CHRONIC: Reproductive system, cardiovascular system.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS GAS MIXTURE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this gas mixture, due to the small cylinder size. If any adverse symptom develops after over-exposure to this gas mixture, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

SKIN EXPOSURE: If irritation of the skin develops after exposure to this gas mixture, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.

EYE EXPOSURE: If irritation of the eye develops after exposure to this gas mixture, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Seek medical assistance immediately, preferably an ophthalmologist.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by over-exposure to this gas mixture. Carbon Monoxide, a component of this gas mixture, can aggravate some diseases of the cardiovascular system, such as coronary artery disease and angina pectoris. Because of the presence of Hydrogen Sulfide, n-Hexane or n-Pentane in this gas mixture, central nervous system conditions, eye disorders, or skin problems may be aggravated by over-exposure to this gas mixture.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate over-exposure. Hyperbaric oxygen is the most efficient antidote to Carbon Monoxide poisoning, the optimum range being 2-2.5 atm. A special mask, or, preferably, a compression chamber to utilize oxygen at these pressures is required. Avoid administering stimulant drugs. Be observant for initial signs of pulmonary edema in the event of severe inhalation over-exposures.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

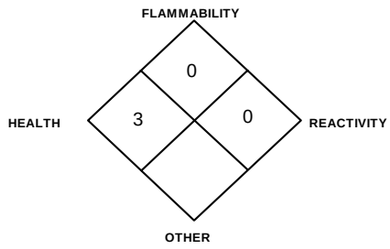
UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture contains toxic gases, Hydrogen Sulfide and Carbon Monoxide, and presents an extreme health hazard to firefighters. This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

NFPA RATING



6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this gas mixture presents significantly less risk of over-exposure to Hydrogen Sulfide and Carbon Monoxide, the toxic components of this gas mixture, and other safety hazards related to the remaining components of this gas mixture, than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated area or outdoors. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for Hydrogen Sulfide, Carbon Monoxide, and Oxygen. Hydrogen Sulfide and Carbon Monoxide level must be below exposure level listed in Section 2 (Composition and Information on Ingredients) and Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify cylinders containing a gas mixture with Hydrogen Sulfide or Carbon Monoxide. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Eye wash stations/safety showers should be near areas where this gas mixture is used or stored. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. All work practices should minimize releases of Hydrogen Sulfide and Carbon Monoxide-containing gas mixtures.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C, 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this gas mixture in well-ventilated areas. If this gas mixture is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Oxygen, Hydrogen Sulfide, and Carbon Monoxide.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if Carbon Monoxide levels exceed the exposure levels given in Section 2 (Composition and Information on Ingredients) or if oxygen levels are below 19.5%, or if either level is unknown during emergency response to a release of this gas mixture. If respiratory protection is required for emergency response to this gas mixture, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards. The following NIOSH respiratory protection recommendations for Hydrogen Sulfide and Carbon Monoxide are provided for further information.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

NIOSH/OSHA RECOMMENDATIONS FOR HYDROGEN SULFIDE CONCENTRATIONS IN AIR:

Up to 100 ppm: Powered air-purifying respirator with cartridge(s) to protect against hydrogen sulfide; or gas mask with canister to protect against hydrogen sulfide; or SAR; or full-facepiece SCBA.

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister to protect against hydrogen sulfide; or escape-type SCBA

NOTE: The IDLH concentration for Hydrogen Sulfide is 100 ppm.

NIOSH/OSHA RECOMMENDATIONS FOR CARBON MONOXIDE CONCENTRATIONS IN AIR:

Up to 350 ppm Supplied Air Respirator (SAR)

Up to 875 ppm Supplied Air Respirator (SAR) operated in a continuous flow mode.

Up to 1200 ppm Gas mask with canister to protect against carbon monoxide; or full-facepiece SCBA; or full-facepiece Supplied Air Respirator (SAR).

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece Supplied Air Respirator (SAR) with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister to protect against carbon monoxide; or escape-type SCBA.

NOTE: End of Service Life Indicator (ESLI) required for gas masks.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: No special protection is needed under normal circumstances of use. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: No special protection is needed under normal circumstances of use. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Nitrogen, the main component of this gas mixture.

GAS DENSITY @ 32°F (0°C) and 1 atm: 0.072 lbs/ ft^3 (1.153 kg/m^3)

FREEZING/MELTING POINT @ 10 psig: -210°C (-345.8°F)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

EVAPORATION RATE (nBuAc = 1): Not applicable.

ODOR THRESHOLD: Not applicable.

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

BOILING POINT: -195.8°C (-320.4°F)

pH: Not applicable.

MOLECULAR WEIGHT: 28.01

EXPANSION RATIO: Not applicable.

SPECIFIC VOLUME (ft^3/lb): 13.8

The following information is for the gas mixture.

APPEARANCE AND COLOR: This gas mixture is a colorless gas which has an rotten egg-like odor, due to the presence of Hydrogen Sulfide.

HOW TO DETECT THIS SUBSTANCE (warning properties): Continuous inhalation of low concentrations of Hydrogen Sulfide (a component of this gas mixture) may cause olfactory fatigue, so that there are no distinct warning properties. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation. Wet lead acetate paper can be used for leak detection. The paper turns black in the presence of Hydrogen Sulfide. Cadmium chloride solutions can also be used. Cadmium solutions will turn yellow upon contact with Hydrogen Sulfide.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state.

DECOMPOSITION PRODUCTS: The thermal decomposition products of Propane, n-Hexane, and n-Pentane include carbon oxides. The decomposition products of Hydrogen Sulfide include water and sulfur oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this gas mixture). Lithium reacts slowly with Nitrogen at ambient temperatures. Components of this gas mixture (Hydrogen Sulfide, Propane, n-Pentane, n-Hexane) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride). Carbon Monoxide is mildly corrosive to nickel and iron (especially at high temperatures and pressures). Hydrogen Sulfide is corrosive to most metals, because it reacts with these substances to form metal sulfides.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this gas mixture:

NITROGEN: There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the

n-PENTANE:

LD_{50} (intravenous, mouse) = 446 mg/kg.

LC_{50} (inhalation, rat) = 364 g/m^3/4 hours

LCLo (inhalation, mouse) = 325 g/m^3/2 hours

n-HEXANE:

Eye, rabbit = 10 mg/ mild

TCLo (inhalation, rat) = 10,000 ppm/7 hr.

TCLo (inhalation, rat) = 5000 ppm/20 hours; teratogenic effects

LD50 (oral, rat) = 28710 mg/kg

LDLo (intraperitoneal, rat) = 9100 mg/kg

LCLo (inhalation, mouse) = 120,000 mg/kg

LD50 (rat, oral): 28,710 mg/kg

ACUTE INHALATION (mouse): 30,000 ppm, narcosis within 30 to 60 minutes; 35,000-40,000 ppm, convulsions and death.

DERMAL (rabbit): 2 to 5 ml/kg for 4 hours resulted in restlessness and discoordination,; death occurred at 5 ml/kg.

HYDROGEN SULFIDE:

LCLo (inhalation, human) = 600 ppm/30 minutes

LDLO (inhalation, man) = 5.7 mg/kg; central nervous system, pulmonary effects

n-HEXANE (continued):

CHRONIC INHALATION (rat): 400-600 ppm, 5 days/week, peripheral neuropathy in 45 days; 850 ppm for 143 days, loss of weight and degeneration of the sciatic nerve. (mouse): 250 ppm, peripheral neuropathy within 7 months; no effects at 100 ppm.

PROPANE:

Long-Term Inhalation: No toxicity or abnormalities were observed when monkeys were exposed to approximately 750 ppm for 90 days. Similar results were obtained when monkeys were exposed to an aerosol spray containing 65% propane and isobutane.

CARBON MONOXIDE:

TCLo (inhalation, mouse) = 65 ppm/24 hours (7-18 preg): rep. effects

TCLo (inhalation, mouse) = 8 pph/1 hour (female 8D post): ter. effects

HYDROGEN SULFIDE (continued):

LCLo (inhalation, human) = 800 ppm/5 minutes

LC_{50} (inhalation, rat) = 444 ppm

CARBON MONOXIDE (continued):

TCLo (inhalation, human) = 600 mg/m^3/10 minutes

LCLo (inhalation, man) = 4000 ppm/30 minutes

TCLo (inhalation, man) = 650 ppm/45 minutes: central nervous system and blood system effects.

LCLo (inhalation, human) = 5000 ppm/5 minutes

LCLo (inhalation, dog) = 4000 ppm/46 minutes

LCLo (inhalation, rabbit) = 4000 ppm

LC_{50} (inhalation, rat) = 1811 ppm/4 hours

LC_{50} (inhalation, guinea pig) = 2450 ppm/4 hours

LC_{50} (inhalation, guinea pig) = 5718 ppm/4 hours

LCLo (inhalation, mammal) = 5000 ppm/5 minutes

LD_{50} (inhalation, wild bird) = 1334 ppm

HYDROGEN SULFIDE (continued):

LC_{50} (inhalation, mouse) = 673 ppm/1 hour

LCLo (inhalation, mammal) = 800 ppm/5 minutes

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: The Hydrogen Sulfide component of this gas mixture, is irritating to the eyes, and may be irritating to the skin.

SENSITIZATION OF PRODUCT: The components of this gas mixture are not known to be skin or respiratory sensitizers. Pentane isomers (i.e. n-Pentane) and Propane can cause cardiac sensitization to epinephrine.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this gas mixture on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for the components of this gas mixture.

Embryotoxicity: This gas mixture contains components that may cause embryotoxic effects in humans; however, due to the small total amount of the components, embryotoxic effects are not expected to occur.

Teratogenicity: This gas mixture is not expected to cause teratogenic effects in humans due to the small cylinder size and small total amount of all components. The Carbon Monoxide component of this gas mixture which exists up to 1%, can cause teratogenic effects in humans. Severe

11. TOXICOLOGICAL INFORMATION (continued)

exposure to Carbon Monoxide during pregnancy has caused adverse effects and the death of the fetus. In general, maternal symptoms are an indicator of the potential risk to the fetus since Carbon Monoxide is toxic to the mother before it is toxic to the fetus.

Reproductive Toxicity: The components of this gas mixture are not expected to cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES (BEIs): Biological Exposure Indices (BEIs) have been determined for the components of this gas mixture, as follows:

CHEMICAL DETERMINANT	SAMPLING TIME	BEI
CARBON MONOXIDE • Carboxyhemoglobin in blood • Carbon monoxide in end-exhaled air	 • End of shift • End of shift	 • 3.5% of hemoglobin • 20 ppm
n-HEXANE • 2,5-Hexanedione in urine • n-Hexane in end-exhaled air	• End of shift	• 5 mg/g creatinine

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this gas mixture.

OXYGEN: Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log K_{ow} = -0.65

PROPANE: Log K_{ow} = 2.38. Water Solubility = 62.4 ppm, 25°C. Propane is readily degraded by soil bacteria.

PENTANE: Log K_{ow} = 3.39. Water Solubility = 38.5 mg/L. LOG BCF (n-pentane) = calculated, 1.90 and 2.35, respectively. Photolysis, hydrolysis, and bioconcentration are not anticipated to be important fate processes. Biodegradation and soil adsorption are anticipated to be more important processes for this compound.

n-HEXANE: Log K_{ow} = 3.90-4.11. Water Solubility = 9.5 mg/L. Estimated Bioconcentration Factor =2.24 and 2.89. Bioconcentration in aquatic organisms is low. Hexane is volatile. Rapid volatilization from water and soil is anticipated for this compound. Hexane will float in slick on surface of the water

HYDROGEN SULFIDE: Water Solubility = 1 g/242 mL at 20°C.

CARBON MONOXIDE: Water solubility = 3.3 ml/100 cc at 0 °C, 2.3 ml at 20°C.

NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C; 1.6 volumes Nitrogen/100 volumes water at 20°C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this gas mixture's effects on plant and animal life. The Hydrogen Sulfide and Carbon Monoxide components of this gas mixture, can be deadly to exposed animal life, producing symptoms similar to those experienced by humans. This gas mixture may also be harmful to plant life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on the effects of this gas effects on aquatic life. The presence of more than a trace of Carbon Monoxide is a hazard to fish. The following aquatic toxicity data are available for the Hydrogen Sulfide component of this gas mixture.

TLm (Asellussp) = 0.111 mg/L/96 hour
TLm (Cranfgonyx sp) =1.07 mg/L/96 hour
TLm (Gammarrus) = 0.84 mg/L/96 hour
LC_{50} (fly inhalation) = 380 mg/m^3/960 minutes
LC_{50} (fly inhalation) = 1500 mg/m^3/7 minutes
TLm (Lepomis macrochirus, bluegill sunfish) = 0.0478 mg/L/96 hour
TLm (Lepomis macrochirus, bluegill sunfish) = 0.0448 mg/L/96 hour at 21-22 °C
TLm (Pimephlaes promelas, fathead minnow) = 0.0071-0.55 mg/L/96 hour
TLm (Salvenilis foninalis, brook trout) = 0.0216-0.038 mg/L/96 hour at 8-12.5 °C

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not Applicable

DOT LABEL(S) REQUIRED: Class 2.2 (Non-Flammable Gas)

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas is considered as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not Applicable

HAZARD LABEL: Class 2.2 (Non-Flammable Gas)

SPECIAL PROVISIONS: None

EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX: 0.12

ERAP INDEX: None

PASSENGER CARRYING SHIP INDEX: None

PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: 75

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

NOTE: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: This gas is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows:

COMPONENT	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
n-Hexane	NO	YES	YES
Hydrogen Sulfide	YES	YES	YES

15. REGULATORY INFORMATION (Continued)

U.S. SARA THRESHOLD PLANNING QUANTITY: Section 302 EHS TPQ = Hydrogen Sulfide = 500 lbs (227 kg);
U.S. TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Hexane = 5000 lb (2270 kg); Hydrogen Sulfide = 100 lbs (45.4 lb)
OTHER U.S. FEDERAL REGULATIONS:

- Hydrogen Sulfide, Carbon Monoxide, Propane, n-Pentane and n-Hexane are subject to the reporting requirements of CFR 29 1910.1000.
- Hydrogen Sulfide, Propane and n-Pentane are subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for each of these gases is 10,000 pounds and so this mixture will not be affected by the regulation.
- Depending on specific operations involving the use of this gas mixture, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Hydrogen Sulfide is listed in Appendix A of this regulation. The Threshold Quantity for Hydrogen Sulfide under this regulation is 1500 lbs.
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
- Nitrogen, Oxygen and n-Hexane are not listed Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Hydrogen Sulfide is listed under this regulation in Table 1 as a Regulated Substance (Toxic Substance), in quantities of 10,000 lbs (4,553 kg) or greater. Carbon Monoxide, Propane and n-Pentane are listed under this regulation in Table 3, as Regulated Substances (Flammable), in quantities of 10,000 lbs (4,553 kg) or greater, and so this mixture will not be affected by the regulation.

U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
California - Permissible Exposure Limits for Chemical Contaminants: Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Florida - Substance List: Oxygen, Carbon Monoxide, n-Pentane, n-Hexane, Hydrogen Sulfide.
Illinois - Toxic Substance List: Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Oxygen, Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: Carbon Monoxide, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Missouri - Employer Information/Toxic Substance List t: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide.
New Jersey - Right to Know Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: Hydrogen Sulfide.
Pennsylvania - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Rhode Island - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Propane, n-Pentane, n-Hexane, Hydrogen Sulfide.
Texas - Hazardous Substance List: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide.
West Virginia - Hazardous Substance List: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide.
Wisconsin - Toxic and Hazardous Substances: n-Pentane, n-Hexane, Propane, Hydrogen Sulfide

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Carbon Monoxide component of this gas mixture is on the California Proposition 65 lists as a chemical known to the State of California to cause birth defects or other reproductive harm.
ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this gas mixture are on the Canadian DSL Inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this gas mixture are not on the CEPA Priorities Substances List.
CANADIAN WHMIS CLASSIFICATION: This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2A, as per the Controlled Product Regulations.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. CALGAZ will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 *"Safe Handling of Compressed Gases in Containers"*
AV-1 *"Safe Handling and Storage of Compressed Gases"*
"Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
619/670-0609

Fax on Demand: 1-800/231-1366

AIR LIQUIDE™

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this gas mixture. To the best of CALGAZ knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

APPENDIX C

Incident Investigation and Reporting Program

INCIDENT INVESTIGATION AND REPORTING MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/19**
REVISION NUMBER	:	**4**

TABLE OF CONTENTS

APPENDICES

Appendix A – Accident Report and Investigation Form

Appendix B – Near Loss Form

Appendix C – Injury Illness Reporting Flow Chart

1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") has instituted the following management program for reporting Environmental Health and Safety (EHS) incidents and near losses, investigation and correcting the causes of incidents, tracking incidents and corrective actions taken, and sharing the cause and corrective actions with Roux personnel. These practices and procedures establish a method to track progress and improvements to the company EHS performance.

2. SCOPE AND APPLICABILITY

These procedures apply to all Roux employees. Employees are required to follow these procedures for all incidents involving Roux personnel, or other personnel (e.g., subcontractors) working for Roux, regardless of the specific work activity or work location.

This program is intended, in part, to fulfill the Occupational Safety and Health Administration (OSHA) occupational injury and illness reporting and recording requirements cited in the Code of Federal Regulations (CFR) at 29 CFR 1904.

3. RESPONSIBILITIES

It shall be the responsibility of all Roux employees to report all incidents as soon as possible to the PM (or Administrative Manager for office-related incidents), SHSO, OHSM and OM, regardless of severity. Additionally, the following positions have specific responsibilities for implementing this specific SOP.

3.1 Corporate Health and Safety Manager (CHSM)

- The CHSM has the responsibility of ensuring that a system is in place for reporting, investigation, correction, and communicating of EHS incidents and near losses.
- The CHSM has the overall responsibility of implementing and communicating the contents of this program to Office Health and Safety Managers (OHSMs).
- The CHSM will review all incidents and corrective actions taken. The CHSM will provide a summary of serious incidents to the Board of Directors.
- The CHSM will communicate learnings from incidents and corrective actions taken to all personnel, through quarterly communications.
- The CHSM will periodically review and evaluate the effectiveness of this procedure.

3.2 Office Manager (OM)

- The OM will designate the individual to serve as the OHSM responsibility for ensuring that requirements in this procedure are met.
- The OM will ensure that sufficient resources are allocated to fulfill the requirements of this procedure.
- The OM will conduct final review of all incident reports prepared under this procedure.

3.3 Office Health and Safety Manager (OHSM)

- It is the responsibility of the OHSM to review draft incident reports and assist the OM in finalizing reports of all accidents, illnesses and incidents related to work activity, and to assist the SHSO when necessary.

- The OHSM may not approve a site-specific HASP unless the HASP includes incident reporting procedures and forms.
- The OHSM will suggest and implement corrective actions to prevent the same type of incident from re-occurring.
- The OHSM will keep all incident reports, corrective action taken, and follow-up forms on file. The OHSM will provide copies of all final reports and forms to the CHSM within one week of the incident. If a serious incident occurs, the CHSM will be notified as soon as possible.
- The occurrence of a serious incident will trigger an EHS audit by the OHSM.

3.4 Project Manager (PM)

- It shall be the PM's responsibility to promptly correct any deficiencies that were determined to cause or contribute to the incident investigated.
- If a site-specific HASP is not utilized, the PM must ensure that field personnel have copies of the Roux Accident Reporting and Investigation Forms.
- The PM has the responsibility of ensuring that the SHSO and other field personnel understand the need for timely incident reporting.
- In the event of an incident, the PM will determine the root cause of the incident with the assistance of the SHSO and/or OHSM. The PM should provide input as to corrective preventative measures.

3.5 Site Health and Safety Officer (SHSO)

- The SHSO shall provide the details of the incident to the OHSM, PM and OM. The OM or his delegate will provide additional notifications, such as, in the event of a work-related motor vehicle accident, to include Roux Legal.
- It is the SHSO's responsibility to immediately notify the OHSM and the PM when any incident occurs. Such notification should take place immediately following the completion of any emergency actions required by the HASP.
- The SHSO should provide input as to corrective preventative measures.
- The SHSO must ensure that corrective actions proposed by the OHSM or OM are carried out.

3.6 All Personnel

- All personnel are responsible for reporting and describing the details of any incident in which they are involved to the SHSO and PM. Such notification should take place immediately following the completion of any emergency actions required by the HASP and after the loss and before the scene is disturbed or vehicles moved.

4. PROCEDURE

4.1 Incident Investigation

On receiving a report of incident or near loss occurrence from a Roux employee, the SHSO or OHSM shall immediately investigate the circumstances and shall make appropriate recommendations to prevent recurrence. The Incident Report form can be found in **Appendix A**, and Near Loss form can be found in **Appendix B**. The OHSM may participate in the investigation of more serious accidents and incidents that occur on-site. The Corporate Health and Safety Manager (CHSM) shall also be immediately notified by telephone on occurrence of a serious accident or incident. At the CHSM's discretion, he may also participate in the investigation.

4.2 Incident Report

Details of the incident shall be documented using the Accident Report and Investigation Forms (Appendix A) within twenty-four (24) hours of the incident and shall be distributed to the SHSO, the OHSM, PM, OM and the CHSM. The CHSM will update OSHA Forms 301 and the 300 log when necessary.

Appendix A – Accident Report and Investigation Form

☐ Roux Environmental Engineering and Geology, D.P.C.
☐ Roux Associates, Inc. ☐ Remedial Engineering, P.C.

ACCIDENT REPORT

Brian Hobbs, Corporate Health and Safety Manager
Cell: (631) 807-0193; Office: (631) 630-2416

PART 1: ADMINISTRATIVE INFORMATION

Project #: _____
Project Name: _____
Project Location (street address/city/state)**:**
_____
_____
Client Corporate Name / Contact / Address / Phone #:
_____
_____
_____
_____
_____

Immediate Verbal Notifications Given To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No
Client Contact	☐Yes	☐No

REPORT STATUS (time due):
☐ Initial (24 hr) Date: _____
☐ Final (5-10 days) Date: _____

Accident Report Delivered To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No

REPORT TYPE: ☐ Loss ☐ Near Loss Estimated Costs: $ _____

OSHA CASE # Assigned by Corporate Health & Safety if Applicable:

Corporate Health & Safety Confirmed Final Accident Report ☐Yes ☐No

DATE OF INCIDENT: _____

TIME INCIDENT OCCURRED: _____ ☐AM ☐PM

INCIDENT LOCATION – City, State, and Country (If outside U.S.A.) _____

INCIDENT TYPES: (Select most appropriate if Loss occurred.)
From lists below, please select the option that best categories the incident. When selecting an injury or illness, also indicate the severity level.

☐**INJURY** ☐**ILLNESS**

----------**Severity Level**----------

☐Fatality ☐First Aid ☐Medical Treatment
☐Restricted Work ☐Lost Time

OTHER INCIDENT TYPES

☐Spill / Release
Material involved: _____
Quantity (U.S. Gallons): _____

☐Misdirected Waste ☐Consent Order ☐NOV
☐Property Damage ☐Exceedance
☐Motor Vehicle ☐Fine / Penalty

ACTIVITY TYPE (Check most appropriate one.)

☐CAMP	☐Gauging	☐Subsurface Clearance
☐Construction	☐O&M	☐Trucking
☐Drilling	☐Other Soil Work (e.g. Compaction)	☐Waste Mgmt.
☐Driving	☐Sampling	☐Work Area Prep.
☐Excavation / Trenching	☐Site Walk/Inspection	☐Other

INJURY TYPE (Check all applicable.)

☐Abrasion	☐Occupational Illness
☐Amputation	☐Puncture
☐Burn	☐Rash
☐Cold/Heat Stress	☐Repetitive Motion
☐Inflammation	☐Sprain/Strain
☐Laceration	☐Other_____

BODY PART AFFECTED (Check all applicable.)

☐Respiratory	☐Shoulder	☐Face
☐Neck	☐Arm	☐Leg
☐Chest	☐Wrist	☐Knee
☐Abdomen	☐Hand/Fingers	☐Ankle
☐Groin	☐Eye	☐Foot/Toes
☐Back	☐Head	☐Other_____

I. PERSON(S) DIRECTLY / INDIRECTLY INVOLVED IN INCIDENT (Attach additional information as necessary/applicable.)

Name/Phone # of Each Person Directly/Indirectly Involved in Incident:	Designate: Roux/Remedial Employee Roux/Remedial Subcontractor Client Employee Client Contractor Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:
1)				
2)				

II. PERSONS INJURED IN INCIDENT (Attach additional information as necessary/applicable.)

Name/Phone # of Each Person Injured in Incident:	Designate: Roux/Remedial Employee Roux/Remedial Subcontractor Client Employee Client Contractor Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:	Description of Injury:
1)					
2)					

III. PROPERTY DAMAGED IN INCIDENT (Attach additional information as necessary/applicable.)

Property Damaged:	Property Location:	Owner Name, Address & Phone #:	Description of Damage:	Estimated Cost:
1)				
2)				$

IV. WITNESSES TO INCIDENT (Attach additional information as necessary/applicable.)

Witness Name:	Address:	Phone #:
1)		
2)		

PART 2: WHAT HAPPENED AND INCIDENT DETAILS

PROVIDE FACTUAL DESCRIPTION OF INCIDENT (e.g., describe loss/near loss, injury, response / treatment).

I. AUTHORITIES/GOVERNMENTAL AGENCIES NOTIFIED (Attach additional information as necessary/applicable.)

Authority/Agency Notified:	Name/Phone #/Fax # of Person Notified:	Address of Person Notified:	Date & Time of Notification:	Exact Information Reported/Provided:

II. PUBLIC RESPONSES TO INCIDENT (if applicable)

Response/Inquiry By: (check one)	Entity Name:	Name/Phone # of Respondent/ Inquirer:	Address of Entity/Person:	Date & Time of Response/Inquiry:
☐Newspaper ☐Television ☐Community Group ☐Neighbors ☐Other _____				

Describe Response/Inquiry:

Roux/Remedial Response:

(Check all that apply.) (Attach photos, drawings, etc. to help illustrate the incident.)
ATTACHED INFORMATION: ☐Photo ☐Sketches ☐Vehicle Acord Form ☐Police Report ☐Other

Name(s) of person(s) who prepared Initial and Final Report:	**Title(s):**	**Phone number(s):**

PART 3: INVESTIGATION TEAM ANALYSIS

Date Investigation Started (MM/DD/YYYY):

Factors, Root Causes, and Solution (FRCS): Complete FRCS form and answer all 7 factor questions. If answering NO to Factors 1 – 4 identify root cause(s) and explain why QIs) occurred. If answering YES to Factors 5 – 7 circle the root cause(s). Transfer the solutions guidance that addresses each root cause from the FRCS form to this form. Attach your completed FRCS Worksheet. If Factors 1-7 do not apply to the incident, write "External Cause" in the Factor column below and leave the remaining fields blank.

DESCRIPTION OF UNDESIRABLE BEHAVIOR/CONDITION

1.

2.

FACTOR(S) AND SOLUTION(S): HOW TO REDUCE POSSIBILITY OF INCIDENT RECURRING
Selection of factors and solutions reflects the analysis of investigation team and is not meant to be a legally binding conclusion as to the Root Cause and/or solution.

CAUSAL FACTOR/ BEHAVIOR/ CONDITION	ROOT CAUSE	SOLUTION(S) [Must Match Root Cause(s)]	PERSON RESPONSIBLE	AGREED DUE DATE	ACTUAL COMPLETION DATE

INVESTIGATION TEAM:

PRINT NAME	JOB POSITION	DATE	SIGNATURE

QUALITY REVIEW Correct root cause(s) identified? Do root cause(s) and solution(s) match? Are solution(s) feasible / maintainable?

Name: **Job Title:**

PART 4: Date Solutions were Implemented & Validated (Were Solutions Effective?)

Date	Solution	Verifier / Validator Name and Job Title	**Details** (of I & V performed)

Appendix B – Near Loss Form

HEALTH & SAFETY NEAR LOSS
ROUX REPORT FORM

☐ **Roux Environmental Engineering and Geology, D.P.C.**
☐ **Roux Associates, Inc.** ☐ **Remedial Engineering, P.C.**

(Check applicable company name)

PART 1: ADMINISTRATIVE INFORMATION

Office: ☐ New York ☐ Massachusetts ☐ New Jersey ☐ Illinois ☐ CA - Los Angeles ☐ CA - Oakland

Project Manager:	**Project Principal:**
Project Name:	**Project Location:**

PART 2: NEAR LOSS INCIDENT DETAILS

Date\Time Occurred (MM/DD/YYYY HH:MM)**:**	**Date\Time Submitted** (MM/DD/YYYY HH:MM)**:**

NEAR LOSS INCIDENT TYPE - What could have happened? - Select all that apply (1-7)

1. ☐ Fire / Explosion
2. ☐ Injury / Illness
3. ☐ Security (e.g., theft, trespassing, vandalism)
4. ☐ Environmental (Spill, permit exceedance, etc.)
5. ☐ Transportation of personnel (vehicle accident)
6. ☐ Property/Equipment Damage
7. ☐ Business Interruption

Event Leading to Potential Injury/Illness:

Job Task*:	**Equipment Involved*:**

WHAT HAPPENED? Do not include individuals' names. Ensure photos, sketches, etc. are not personally identifiable unless written consent has been obtained.

Summary (1-2 sentences. Provide brief description of the incident. Provide facts only, no speculation or opinion)**:**

Incident Details (Brief factual details of what, where, when; include photos, sketches, etc. as attachments)**:**

Immediate Corrective Actions Taken:

SERIOUS INJURY OR FATALITY (SIF): IF AN ACTUAL SIF, USE EXISTING ROUX ACCIDENT REPORTING FORM

Could this have resulted in a SIF? ☐ **Yes** ☐ **No**

A potential SIF is defined as likely to have caused an injury resulting in significant physical body damage with probable long term and/or life altering complications.

INCIDENT INVOLVED:

Roux Employee: ☐ **Yes** ☐ **No** **Subcontractor Company Name:**

INVESTIGATION TEAM

NAME	JOB TITLE	NAME	JOB TITLE

PART 3: INCIDENT INVESTIGATION FINDINGS AND REPORT QUALITY REVIEW

Date Investigation Started (mm/dd/yyyy):

Factors, Root Causes, and Solution (FRCS): Complete FRCS form and answer all 7 factor questions. If answering NO to Factors 1 – 4 identify root cause(s) and explain why QIs) occurred. If answering YES to Factors 5 – 7 circle the root cause(s). Transfer the solutions guidance that addresses each root cause from the FRCS form to this form. Attach your completed FRCS Worksheet. If Factors 1-7 do not apply to the incident, write "External Cause" in the Factor column below and leave the remaining fields blank. Do not include individuals' names.

DESCRIPTION OF UNDESIRABLE BEHAVIOR/CONDITION

1.

2.

FACTOR(S) AND SOLUTION(S): HOW TO REDUCE POSSIBILITY OF INCIDENT RECURRING
Selection of factors and solutions reflects the analysis of investigation team and is not meant to be a legally binding conclusion as to the Root Cause and/or solution.

Behavior / Condition	Root Cause	Solution(s) (Must Match Root Cause)	Person Responsible for Completion	Completion Target Date	Completion Actual Date

QUALITY REVIEW Correct root cause(s) identified? Do root cause(s) and solution(s) match? Are solution(s) feasible / maintainable?

Name: **Job Title:**

PART 4: Date Solutions were Implemented & Validated (Were Solutions Effective?)

Date	Solution	Verifier / Validator Name and Job Title	**Details** (of I & V performed)

***JOB TASK - Select the most appropriate one** (primary job associated with incident-related work activity, avoid "Other" if possible)

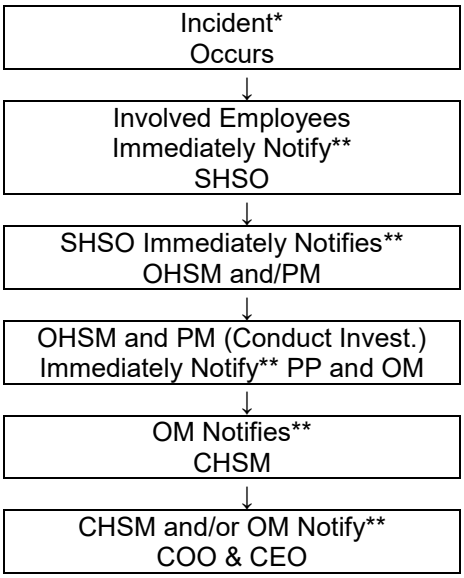
1. CAMP
2. Construction
3. Drilling
4. Driving
5. Excavation/Trenching
6. Gauging
7. O&M
8. Other Soil Work (e.g. Compaction)
9. Sampling
10. Site Walk/ Inspection
11. Subsurface Clearance
12. Trucking
13. Waste Management
14. Work Area Preparation
15. Other

***EQUIPMENT INVOLVED THAT CONTRIBUTED TO H&S NEAR LOSS - Select all that apply**

1. Air Stripper
2. API Separator
3. Automobile
4. Boom Material
5. Bulldozer
6. Cable
7. Carbon Drum / Vessel
8. Chain Block
9. Compressor, Air
10. Control Panel (local)
11. Crane (mobile)
12. Drill Rig
13. Drilling Equipment, Vacuum
14. Drum, Vertical
15. Dump Truck
16. Electric Heater
17. Electrical Power Supply
18. Engine, Combustion
19. Equipment Safety Grounding
20. Excavator / Power Shovel
21. Exclusion Zone Equipment
22 Fan / Blower
23 Fencing
24 Filter
25. Fire Extinguisher
26. Forklift
27. Front End Loader
28. Grader
29. Hammer
30. Knife
31. Non-Powered Equipment
32. Powered Equipment
33. Drill
34. Grinder
35. Hydraulic Torque Wrench
36. Powered Saw
37. Impact Wrench
38. Saw
39. Screwdriver
40. Shears
41. Shovel
42. Snip
43. Wrench
44. Hoist
45, Hook/Clamp/Buckle, etc.
46. Jack
47. Ladder, Extension
48. Ladder, Platform
49. Ladder, Step
50. Lock Out / Tag Out
51. Maintenance Tool, General
52. Manifold
53, Manlift/Basket/Cherry Picker
54. Motor, Electric
55. Oxidizer
56. Pallet
57. Piping
58. Piping, Hose
59. Piping, Injection/Mixing Point
60. Hydrojet
61. Centrifugal Pump
62. Diaphragm Pump
63. Reciprocating Pump
64. Regenerative Pump
65. Rotary Pump
66. Transfer Pump
67. Submersible Pump
68. Face Shield
69. Fall Protection
70. Gloves
71. Hard Hat / Helmet
72. Hearing Protection
73. Respiratory PPE (Chemical)
74. Respiratory PPE (Particulate)
75. Safety Glasses
76. Safety Goggles
77. Safety Shoes / Boots
78. Safety Vest / Clothing
79. Rope
80. Bailer
81. Geoprobe
82. Hand Auger
83. PID
84. Multi-Gas Meter
85. Sample Container
86. Split-Spoon Sampler
87. Sling
88. Snow Blower
89. Snow Plow
90. Space Heater
91. Air Sparging System
92. Carbon Treatment Sys
93. Chemical Oxidation S
94. Dual Phase Product Recovery System
95. Groundwater Pump and Treat System
96. POET System
97. Shed or Trailer
98. Vapor Extraction System
99. Vapor-Phase Treatment System
100. Other System, Type:___
101. Surge Tank
102. Underground Tank
103. Telemetry System
104. Testing Devices
105. Tractor Trailer
106. Truck, Flatbed
107. Truck, Pickup
108. Truck, Tank Truck
109. Truck, Vacuum
110. Safety Valve
111. Block Valve
112. Extraction Well
113. Monitoring Well
114. Recovery Well
115. Winch
116. Wire Rope
117. No Equipment Involved
118. MPT – Traffic Control Devices
118. Not in List (describe):___

Appendix C – Injury Illness Reporting Flow Chart

Health & Safety Near/Loss – Loss (Incident)*
Notification Flow Chart



* Incident – any work or site-related occurrence that resulted in, or could potentially have resulted in, the need for medical care or in property damage (i.e., all injuries or illnesses, exposure to toxic materials or any other significant occurrence resulting in property damage or in a "near loss")

** Verbal Notification

Initial Incident Report (written) to SHSO, OHSM, OM and CHSM within 24 hours
Follow-up Report within one week.

APPENDIX D

Heavy Equipment Exclusion Zone Policy

HEAVY EQUIPMENT EXCLUSION ZONE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**07/18**
REVISION NUMBER	:	**1**

TABLE OF CONTENTS

1. PURPOSE

The purpose of the Exclusion Zone Management Program is to establish the minimum clearance distance that must be maintained between workers and heavy equipment while equipment is in operation (i.e., engaged or moving). The intent is to have no personnel or equipment entering the Exclusion Zone while the equipment is in operation or moving to ensure that Roux and Subcontractor employees are not unnecessarily exposed to the hazards of the equipment.

2. SCOPE AND APPLICABILITY

This Management Program applies to all Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") employees and their subcontractors who are performing field work and are potentially exposed to heavy equipment. For the purpose of this program, heavy equipment includes, but is not necessarily limited to: excavation equipment, drill rigs, vacuum trucks, forklifts, lull telehandlers, man lifts, bobcats, delivery trucks, etc.

3. PROCEDURES

As specified in the following sections of this Program, an Exclusion Zones must be established and maintained during activities involving the movement/operation of heavy equipment. The Exclusion Zone requirements apply to all personnel on the site but are primarily focused on those personnel who are required to be working in the vicinity of the equipment. The exclusion zone is in effect when heavy equipment is moving or engaged (ex. movement of an arm or bucket of an excavator, rotation of an auger, lifting of a load with a forklift, raising/lowering of a man lift, etc.).

1. The Exclusion Zone must meet the following minimum requirements:
   - A minimum distance of 10 feet from all heavy equipment and loads being moved by the equipment;
   - Greater than the swing/reach radius of any moving part on the heavy equipment (i.e., for large equipment this may mean an exclusion zone distance larger than 20 feet);
   - Greater than the tip-over distance of the heavy equipment; and
   - Greater than the radius of blind spots.

   The size of the Exclusion Zone will need to be determined on a task-specific basis considering the size of the heavy equipment in use and the task being performed. Prior to all heavy equipment operations, the Exclusion Zone(s) distance must be specifically identified in the Job Safety Analysis (JSA).
2. The spotter (or another individual) should be assigned responsibility for enforcing the Exclusion Zone. The spotter should be positioned immediately outside of the Exclusion Zone within a clear line of sight of the equipment operator. The spotter must signal the operator to stop work if anyone or anything has the potential to enter or compromise the Exclusion Zone. The operator should stop work if the spotter is not within his/her line of sight. If multiple pieces of equipment are being used, each piece of equipment must have its own Exclusion Zone and spotter. For large excavation and demolition projects the spotter should be in constant radio contact (not cell phone) with the machine driver.
3. If an individual must enter the Exclusion Zone, the designated Spotter must signal the Equipment Operator to stop the equipment. Once the equipment is no longer moving (ex. movement of an arm of an excavator is STOPPED, lifting of a load with a forklift STOPPED, raising/lowering of a man lift is

STOPPED, etc.), the operator must DISENGAGE THE CONTROLS and STOP and SIGNAL BY "SHOWING HIS HANDS". This signal will indicate that it is safe for the personnel to enter the limits of the Exclusion Zone to perform the required activity. The equipment must remain completely stopped/disengaged until all personnel have exited the limits of the Exclusion Zone and the designated Spotter has signaled by "SHOWING HIS HANDS" to the Equipment Operator that it is safe to resume operations.

4. When entering the limits of the Exclusion Zone, personnel must at a minimum:
   - Establish eye contact with the operator and approach the heavy equipment in a manner that is in direct line of sight to the Equipment Operator;
   - Never walk under any suspended loads or raised booms/arms of the heavy equipment; and
   - Identify a travel path that is free of Slip/Trip/Fall hazards.
5. The Exclusion Zone should be delineated using cones with orange snow fence or solid poles between the cones, barrels, tape or other measures. For work in rights-of-way rigid barriers, such as Jersey barriers or temporary chain link fence should be used. For certain types of wide-spread or moving/mobile equipment operations, such delineation may not be practicable around pieces of equipment or individual work areas. In such instances, it is expected that the entire operation will be within a larger secure work area or that additional means will be utilized to ensure security of the work zone.

All subcontractors who provide heavy equipment operations to field projects must implement a program that meets or exceeds the expectations described above as well as any additional requirements that may be required on a client or site-specific basis.

3.1 Exceptions

It is recognized that certain heavy equipment activities may require personnel to work within the limits of the Exclusion Zone as specified in this program. Such activities may include certain excavation clearance tasks, drill crew activities or construction tasks. However, any such activity must be pre-planned with emphasis on limiting the amount and potential exposure of any activity required within the zone. The critical safety steps to mitigate the hazards associated with working within the Exclusion Zone must be defined in the JSA and potentially other project-specific plans (i.e., critical lift plans, etc.), and approved by the Roux Project Principal and client representative, if required, prior to implementation.

4. TRAINING

Many Roux projects have different requirements that are client-specific or site-specific in nature. It is the responsibility of the Project Principal (or Project Manager if delegated this responsibility by the Project Principal) to ensure that the workers assigned to his/her projects are provided orientation and training with respect to these client and/or site-specific requirements.

APPENDIX E

Subsurface Utility Clearance Management Program

SUBSURFACE UTILITY CLEARANCE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	**:**	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	**:**	**07/18**
REVISION NUMBER	**:**	**1**

TABLE OF CONTENTS

APPENDICES

1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") has instituted the following program for completing proper utility mark-outs and for conducting subsurface clearance activities. This establishes a method to ensure, to the greatest extent possible, that utilities have been identified and contact and/or damage to underground utilities and other subsurface structures will be avoided.

2. SCOPE AND APPLICABILITY

The Subsurface Utility Clearance Management Program applies to all Roux employees, its contractors and subcontractors. Employees are expected to follow this program for all intrusive work involving Roux or other personnel (e.g., contractors/subcontractors) working for Roux unless the client's requirements are more stringent. Deviation from the program regardless of the specific work activity or work location must be pre-approved based on client's site knowledge, site experience and client's willingness for the use of this program. Any and all exceptions shall be documented and pre-approved by the Project Principal and the Office Manager.

3. PROCEDURES

3.1 Before Intrusive Activities

During the project kick-off meeting for intrusive activities the PM will review the Roux Subsurface Utility Clearance Checklist and Utility Verification (Appendix C) / Site Walkthrough Record (Appendix D) and the below bullet points with the project field team:

(Please note that these are intended as general reminders only and should not be solely relied upon.)

- Ensure the Mark-out / Stake-out Request Information Sheet (or one-call report) is complete and accurate for the site including address and cross streets and review for missing utilities. (Note: utility mark-out organizations do not have contracts with all utilities and it is often necessary to contact certain utilities separately such as the local water and sewer authorities).
- Have written confirmation prior to mobilizing to the site that the firm or Roux personnel performing the intrusive activity has correctly completed the mark-out notification process including requesting mark-outs, waiting for mark-outs to be applied to ground surfaces at the site, and receiving written confirmation of findings (via fax or email) from utility operators for all known or suspected utilities in the proposed area of intrusive activity, and provided utility owner written confirmation to Roux personnel for review and project files documentation.
- Do not begin any intrusive activity until all utilities mark-out has been completed (i.e., did all utilities mark-out the site?) and any unresolved mark-out issues are finalized. Perform a site walk to review the existing utilities and determine if said utilities have been located by the utility locators.

  (Note: The Tolerance Zone is defined as two feet plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct banks and other non-cylindrical utilities) of a utility and two feet from the outside edge of any subsurface structure.)
- Install Pre-Clearance exploratory test holes (e.g., hand-dug test holes or other soft digging techniques) for the first 5-ft below land surface (BLS) at each location prior to conducting mechanized intrusive activities. The size of the pre-clearance exploratory test hole should be at a minimum twice the diameter of any downhole tool or boring device. (Note: Pre-Clearance exploratory test holes should be defined in the SOW/proposal provided to the client to prevent project delays and to allow adequate time for PM and PP to evaluate alternative approaches for the project. Alternative approaches will need to be pre-approved by the OM.

- For excavations, all utilities need to be marked and then exposed by hand following the protocols in this program. Pre-clearing for excavations may be performed by the "moat" technique (i.e., soft digging around the perimeter). In these cases, dig in small lifts (<12" for first 5 feet) using a dedicated spotter.) For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of hand-dug test holes performed to expose the utility. Once structures have been verified a minimum clearance of two feet must be maintained between the utility and any powered equipment.
- In addition, the following activities should be conducted:
  - Review the work scope to be performed with the site owner/tenant to determine if it may impact any utilities;
  - Attempt to procure any utility maps or historic drawings of subsurface conditions of the site;
  - **Determine the need for utility owner companies to be contacted or to have their representatives on site**;
  - Where mark-outs terminate at the property boundary, consider the use of private utility locating / GPR / geophysical-type services which may be helpful in locating utilities. Use of private utility locating firms, however, does not eliminate the legal requirement for the Excavator firm to submit a request for Public Utility Mark-outs. Also, the information provided by the service may be inaccurate and unable to locate subsurface utilities and structures in urban areas, landfills, urban fill areas and below reinforced slabs, etc. They should not be relied upon as the only means of performing utility clearance;
  - Documented description of the dig site which is included in the projects Health and Safety Plan (HASP) and one call report will be maintained in the field and distributed amongst Roux personnel its contractors and subcontractors; and
  - Documentation of the actual placement of mark outs in the field shall be collected using dated pictures, videos and/or sketches with distance from markings to fixed objects. All documentation shall be maintained within the project file.

3.2 During Intrusive Activities

The PM, field team lead or personnel performing oversight is to:

- Ensure the mark-out remains valid. (In certain states there are limits regarding the duration of time after the mark-out was applied to the ground surface work can be started or interrupted.) Additionally, the mark-outs must be maintained, documented, and in many cases refreshed periodically to be considered valid, this will be accomplished through calls to the one call center.
- Ensure intrusive activities are only performed within the safe boundaries of the mark-out as detailed in the One-Call Report.
- Halt all work if intrusive activities have resulted in discovery of an unmarked utility. Roux personnel shall notify the facility owner/operator and the one call center. All incidents such as this will be reported as per Roux Incident Investigation and Reporting Management Program.
- Halt all work if intrusive activities must take place outside of the safe boundaries of a mark-out and only proceed after new mark-outs are performed.
- Halt the intrusive activities and immediately consult with the PP if an unmarked utility is encountered.
- Completing any subsurface utility clearance incident reports that are necessary.

- If a utility cannot be found as marked Roux personnel shall notify the facility owner/operator directly or through the one call center. Following notification, the excavation may continue, unless otherwise specified in state law.
- Contractors/subcontractors must contact the one-call center to refresh the ticket when the excavation continues past the life of the ticket. Ticket life shall be dictated by state law however at a maximum ticket life shall not exceed 20 working days.

3.3 Stop Work Authority

Each Roux employee has Stop Work Authority which he or she will execute upon determination of any imminent safety hazard, emergency situation, or other potentially dangerous situation, such as hazardous weather conditions. This Stop Work Authority includes subsurface clearance issues such as the adequacy of a mark-out or identification during intrusive operations of an unexpected underground utility. Authorization to proceed with work will be issued by the PM/PP after such action is reviewed and resolved. The PM will initiate and execute all management notifications and contact with emergency facilities and personnel when this action is appropriate.

Appendix A - Definitions

Intrusive Work Activities	All activities such as digging or scraping the surface, including but not limited to, excavation, test pitting or trenching, soil vapor sampling or the installation of soil borings, soil vapor monitoring points and wells, or monitoring wells, and drilling within the basement slab of a recently demolished building.
Mark-out / Stake Out	The process of contracting with a competent and qualified company to confirm the presence or absence of underground utilities and structures. This process will clearly mark-out and delineate utilities that are identified so that intrusive work activities can be performed without causing disturbance or damage to the subsurface utilities and structures. After utility mark-outs are completed the soft digging will be completed prior to intrusive work.
Tolerance Zone	Defined as two feet on either side of the designated centerline of an identified utility, plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct backs and other non-cylindrical utilities) of that utility and two feet from the outside edge of any subsurface structure.
Structure	For the purpose of this program a structure is defined as any underground feature that may a present potential source(s) of energy such as, but not limited to, utility vaults, bunkers, piping, electrical boxes, wires, conduits, culverts, utility lines, underground tanks and ducts.
Soft Digging	The safest way to remove material from unknown obstructions or services is by using tools such as a vactor or air knife, non-mechanical tools, or hand tools. The methods are clean and non-evasive and used for uncovering and exposing buried services, excavating and for providing a quick method of soil removal from sensitive areas.
Verification	Exploratory test-hole dug with hand tools within the Tolerance Zone to expose and verify the location, type, size, direction-of-run and depth of a utility or subsurface structure. Vacuum excavation (soft dig) methods can further facilitate exposure of a subsurface utility and accurately provide its location and identification prior to intrusive work approaching the Tolerance Zone.

Appendix B - Example of Completed One Call Report

Example Completed One-Call Report

New York 811

Send To: C_EMAIL Seq No: 744

Ticket No: 133451007 ROUTINE

Start Date: 12/16/13 Time: 7:00 AM Lead Time: 20

State: NY County: QUEENS Place: QUEENS
Dig Street: 46TH AVE Address:
Nearest Intersecting Street: VERNON BLVD
Second Intersecting Street: 11TH ST

Type of Work: SOIL BORINGS
Type of Equipment: GEOPROBE
Work Being Done For: ROUX

In Street: X On Sidewalk: X Private Property: Other:
On Property Location if Private: Front: Rear: Side:

Location of Work: MARK THE ENTIRE NORTH SIDE OF THE STREET AND SIDEWALK OF: 46TH AVE BETWEEN VERNON BLVD AND 11TH STREET

Remarks:

Nad: Lat: Lon: Zone:
ExCoord NW Lat: 40.7475399 Lon: -73.9534811 SE Lat: 40.7457406 Lon: -73.9493680

Company : ZEBRA ENVIROMENTAL Best Time: 6AM-5PM
Contact Name: DAVID VINES Phone: (516)596-6300
Field Contact: DAVID VINES Phone: (516)596-6300
Caller Address: 30 N PROSPECT AVE Fax Phone: (516)596-4422
LYNBROOK, NY 11563
Email Address: david@zebraenv.com

Additional Operators Notified:
ATTNY01 AT&T CORPORATION (903)753-3145
CEQ CONSOLIDATED EDISON CO. OF N.Y (800)778-9140
MCINY01 MCI (800)289-3427
PANYNJ01 PORT AUTHORITY OF NY & NJ (201)595-4841
VZQ VERIZON COMMUNICATIONS (516)297-1602

Link to Map for C_EMAIL: http://ny.itic.occinc.com/XGMZ-DF2-L23-YAY

Original Call Date: 12/11/13 Time: 1:15 PM Op: webusr
IMPORTANT NOTE: YOU MUST CONTACT ANY OTHER UTILITIES DIRECTLY

Appendix C - Roux Subsurface Utility Clearance Checklist

Roux Subsurface Utility Clearance Checklist ***Date of Revision – 12/3/14***

Work site set-up and work execution

ACTIVITY	Yes	No	N/A	COMMENTS INCLUDING JUSTIFICATION IF RESPONSE IS NO OR NOT APPLICABLE
Daily site safety meeting conducted, SPSAs performed, JSAs reviewed, appropriate work permits obtained.				
HASP is available and reviewed by site workers / visitors.				
Subsurface Utility Clearance Procedure has been reviewed with all site workers.				
Work area secured; traffic control established as needed. Emergency shut-off switch located. Fire extinguishers / other safety equipment available as needed.				
Utility mark-outs (public / private) clear and visible. Provide Excavator's Stake-Out Reference Number / Request Date / Time.				
Tolerance zone work identified.				
Work execution plan reviewed and adhered to (ground disturbance methods, clearance depths, any special utility protection requirements, or any other execution requirements; especially for Tolerance Zone work).				
Verbal endorsement received from Roux PM for any required field deviations to work execution plan.				

<u>Key reminders for execution</u>:

The Subsurface Utility Clearance Protocol should be referenced to determine all requirements while executing subsurface work. The bullet points below are intended as general reminders only and should not be solely relied upon.

- Tolerance zone is defined as two feet plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct banks and other non-cylindrical utilities) of a utility and two feet from the outside of any subsurface structure.
- Install Pre-Clearance exploratory test holes (e.g., hand-dug test holes or vacuum excavation) must be performed for the first five feet below land surface (BLS) at each location prior to conducting mechanized intrusive activities. The size of the pre-clearance exploratory test hole should be at a minimum twice the diameter of any downhole tool or boring device. (Note: Pre-clearance exploratory test holes should be defined in the SOW/proposal provided to the client to prevent project delays and to allow adequate time for PM and PP to evaluate alternative approaches for the project. Alternate approaches will need to be pre-approved by the OM.
- For excavations, all utilities need to be marked and then exposed by hand following the protocols in this program. Pre-clearing for excavations may be performed by the "moat" technique (i.e., soft

digging around the perimeter). In these cases, dig in small lifts (<12" for first five feet) using a dedicated spotter.) For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of hand-dug test holes to expose the utility. Once structures have been verified a minimum clearance of two feet must be maintained between the utility and any powered equipment.

Appendix D - Utility Verification/Site Walkthrough Record

Employee Name: _____

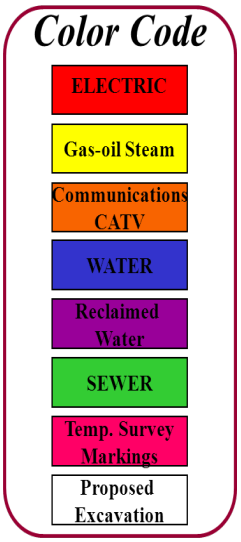
Date: _____

Instructions: For each utility suspected at the job site, indicate location on the job site, approximate burial depth, and means of detecting the utility. Leave blank if that utility is not believed to be present.

Utility	Description of Utility Location Identified Onsite	Approx. Depth (bls)	Method / Instrumentation used to determine Utility Location	Utility Owner Response (Date/Time)	Mark Out Indicates (Clear / Conflict)
Electrical Lines					
Gas Lines					
Pipelines					
Steam Lines					
Water Lines					
Sanitary and Stormwater Sewer lines					
Pressured Air-Lines					
Tank Vent Lines					
Fiber Optic Lines					
Underground Storage Tanks					
Phone Lines/ Other					

* bls - below land surface

Site Sketch Showing Utilities:



Other Comments / Findings:

Completed by: _____

Signature: _____ Date: _____

APPENDIX F

Personal Protective Equipment Management Program

PERSONAL PROTECTIVE EQUIPMENT MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	**:**	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	**:**	**01/19**
REVISION NUMBER	**:**	**4**

TABLE OF CONTENTS

1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") has instituted the following program to establish guidelines for the selection of personal protective equipment (PPE) for use by Roux personnel performing field activities in hazardous environments. PPE is not meant to be a substitute for engineering, work practice, and/or administrative controls, but PPE should be used in conjunction with these controls to protect the employees in the work place. Clothing, body coverings, and other accessories designed to prevent worker exposure to workplace hazards are all types of PPE. To ensure adequate PPE employee-owned PPE is evaluated on a case-by-case basis to insure its adequacy, maintenance and sanitation.

2. SCOPE AND APPLICABILITY

These guidelines apply to all PPE selection decisions to be made in implementing the Roux program. The foundations for this program are the numerous Occupational Health and Safety Administration (OSHA) standards related to PPE cited in 29 CFR 1910 Subpart I, 29 CFR 1926 Subpart E, and the hazardous environment work employee protection requirements under the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 CFR 1910.120 and 1926.65. To ensure hazard assessments are documented the levels of protection, types of protection and tasks requiring protection are covered in site-specific Health and Safety Plans (HASPs) and Job Safety Analyses (JSAs).

3. PROCEDURES

Due to the varied nature of site activities and the different potential hazards associated with different sites, several aspects must be considered when selecting PPE. The following text describes PPE selection logic and provides guidelines and requirements for the appropriate selection and use of PPE.

3.1 Introduction

To harm the body, chemicals must first gain entrance. The intact skin and the respiratory tract are usually the first body tissues attacked by chemical contaminants. These tissues provide barriers to some chemicals but in many cases, are damaged themselves or are highly permeable by certain chemical compounds. Personal protective equipment therefore is used to minimize or eliminate chemical compounds coming into contact with these first barrier tissues.

The proper selection of equipment is important in preventing exposures. The PM making the selection will have to take several factors into consideration. The level of protection, type and kind of equipment selected depends on the hazardous conditions and in some cases cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors must be made before work can be safely carried out.

3.2 Types of PPE

The type and selection of PPE must meet certain general criteria and requirements as required under OSHA 29 CFR 1910.132 and 1926.95. In addition to these general requirements, specific requirements and specifications exist for some types of PPE that form the basis of the protective clothing scheme. Following is a list of the common types of specific PPE and the specific requirements for the PPE type, where applicable:

1. Hard Hats - Regulated by 29 CFR 1910.135 and 1926.100; and, specified in ANSI Z89.1.

2. Face Shields and Safety Glasses - Regulated by 29 CFR 1910.133 and 1926.102; and, specified in ANSI Z87.1.
3. Respiratory Protection - Regulated by 29 CFR 1910.134 and 1926.103.
4. Hand Protection - Not specifically regulated.
5. Foot Protection - Regulated by 29 CFR 1910.136 and 1926.96; and, specified in ANSI Z41.1.
6. Protective Clothing (e.g., fully encapsulated suits, aprons) - Not specifically regulated.

3.3 Protective Clothing Selection Criteria

3.3.1 Chemicals Present

The most important factor in selecting PPE is the determination of what chemicals the employee may be exposed to. On field investigations, the number of chemicals may range from a few to several hundred. The exact chemicals or group of chemicals present at the site (certain groups tend to require similar protection) can be determined by collecting and analyzing samples of the air, soil, water, or other site media. When data are lacking, research into the materials used or stored at the site can be used to infer chemicals possibly on the site.

Once the known or suspected chemicals have been identified, and taking into consideration the type of work to be performed, the most appropriate clothing shall be selected.

Protective garments are made of several different substances for protection against specific chemicals. There is no universal protective material. All will decompose, be permeated by, or otherwise fail to protect under given circumstances. Fortunately, most manufacturers make guides to the use of their products (i.e., Dupont's Tyvek™ Permeation Guide). These guides are usually for gloves and coveralls and typically provide information regarding chemical degradation rates (failure of the material to maintain structural integrity when in contact with the chemical), and may provide information on the permeation rate (whether or not the material allows the chemical to pass through). When permeation tables are available, they shall be used in conjunction with degradation tables to determine the most appropriate protective material.

During most site work, chemicals are usually in mixed combinations and the protective materials are not in continuous contact with pure chemicals for long periods of time; therefore, the selected material may be adequate for the particular chemical and type of work being performed, yet not the "best" protecting material for all site chemicals and activities. Selection shall depend upon the most hazardous chemicals based on their hazards and concentrations. Sometimes layering, using several different layers of protective materials, affords the best protection.

3.3.2 Concentration of the Chemical(s)

One of the major criteria for selecting protective material is the concentration of the chemical(s) in air, liquid, and/or solid state. Airborne and liquid chemical concentrations should be compared to the OSHA standards and/or American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines to determine the level of skin or other absorptive surface (e.g., eyes) protection needed. While these standards are not designed specifically for skin exposed directly to the liquid, they may provide skin designations indicative of chemicals known to have significant skin or dermal absorption effects. For example, airborne levels of PCB on-site may be

low because it is not very volatile, so the inhalation hazard may be minimal; however, PCB-containing liquid coming in direct contact with the skin may cause overexposure. Thus, PCB has been assigned a skin designation in both the OSHA and ACGIH exposure limit tables.

3.3.3 Physical State

The characteristics of a chemical may range from nontoxic to extremely toxic depending on its physical state. Inorganic lead in soil would not be considered toxic to site personnel, unless it became airborne, since it is generally not absorbed through the intact skin. Organic lead in a liquid could be readily absorbed. Soil is frequently contaminated with hazardous materials. Concentrations will vary from a few parts per million to nearly one hundred percent. The degree of hazard is dependent on the type of soil and concentration of the chemical. Generally speaking, "dry" soils do not cause a hazard to site personnel if they take minimal precautions such as wearing some type of lightweight gloves.

3.3.4 Length of Exposure

The length of time a material is exposed to a chemical increases the probability of breakthrough. Determinations of actual breakthrough times for short-term exposures indicate that several different materials can be used which would be considered inadequate under long-term exposures. It should be kept in mind that during testing, a pure (100% composition) liquid is usually placed in direct contact with the material producing a worst-case situation.

3.3.5 Abrasion

When selecting protective clothing, the job the employee is engaged in must be taken into consideration. Persons moving drums or performing other manual tasks may require added protection for their hands, lower chest and thighs. The use of leather gloves and a heavy apron over the other normal protective clothing will help prevent damage to the normal PPE and thus reduce worker exposures.

3.3.6 Dexterity

Although protection from skin and inhalation hazards is the primary concern when selecting PPE, the ability to perform the assigned task must be maintained. For example, personnel cannot be expected to perform work that requires fine dexterity if they must wear a thick glove. Therefore, the PPE selection process must consider the task being performed and provide PPE alternatives or techniques that allow dexterity to be maintained while still protecting the worker (e.g., wearing tight latex gloves over more bulky hand protection to increase dexterity).

3.3.7 Ability to Decontaminate

If disposable clothing cannot be used, the ability to decontaminate the materials selected must be taken into consideration. Once a chemical contacts the material, it must be cleaned before it can be reused. If the chemical has completely permeated the material, it is unlikely that the clothing can be adequately decontaminated and the material should be discarded.

3.3.8 Climactic Conditions

The human body works best with few restraints from clothing. Protective clothing adds a burden by adding weight and restricting movement as well as preventing the natural cooling process. In severe situations, a modified work program must be used.

Some materials act differently when they are very hot and very cold. For example, PVC becomes almost brittle in very cold temperatures. If there are any questions about the stability of the protective materials under different conditions, the manufacturer should be contacted.

3.3.9 Work Load

Like climactic conditions, the type of work activity may affect work duration and the ability or personnel to perform certain tasks. Similarly, the amount of protective materials a person wears will affect their ability to perform certain tasks. For example, a person in a total encapsulating suit, even at 72 ^{o}F, cannot work for more than a short period of time without requiring a break.

The work schedule should be adjusted to maintain the health of the employees. Special consideration should be given to the selection of clothing that both protects and adds the least burden when personnel are required to perform strenuous tasks. Excessive bodily stress frequently represents the most significant hazard encountered during field work.

3.4 Types of Protective Materials

1. Cellulose or Paper
2. Natural and Synthetic Fibers
    a. Tyvek™
    b. Nomex™
3. Elastomers
    a. Polyethylene
    b. Saran
    c. Polyvinyl Chloride (PVC)
    d. Neoprene
    e. Butyl Rubber
    f. Viton

3.5 Protection Levels

3.5.1 Level A Protection

Level A protection (a fully encapsulated suit) is used when skin hazards exist or when there is no known data that positively rule out skin and other absorption hazards. Since Level A protection is extremely physiologically and psychologically stressful, the decision to use this protection must be carefully considered. At no time will Level A work be performed without the consent of the OM. The following conditions suggest a need for Level A protection:

- confined facilities where probability of skin contact is high;
- sites containing known skin hazards;
- sites with no established history to rule out skin and other absorption hazards;
- atmosphere immediately dangerous to life and health (IDLH) through the skin absorption route;
- site exhibiting signs of acute mammalian toxicity (e.g., dead animals, illnesses associated with past entry into site by humans);

- sites at which sealed drums of unknown materials must be opened;
- total atmospheric readings on the Photoionization Detector (PID), Flame Ionization Detector (FID), and similar instruments indicate 500 to 1,000 ppm of unidentified substances; and
- extremely hazardous substances (e.g., cyanide compounds, concentrated pesticides, Department of Transportation Poison "A" materials, suspected carcinogens and infectious substances) are known or suspected to be present and skin contact is possible.

The following items constitute Level A protection:

- open circuit, pressure-demand self-contained breathing apparatus (SCBA);
- totally encapsulated suit;
- gloves, inner (surgical type);
- gloves, outer;
- chemical protective;
- boots, chemical protective, steel toe and shank;
- radiation detector (if applicable); and
- communications.

3.5.2 Level B Protection

Level B protection is utilized when the highest level of respiratory protection is needed but hazardous material exposure to the few unprotected areas of the body is unlikely.

The following conditions suggest a need for Level B protection:

- the type and atmospheric concentration of toxic substances have been identified and they require the highest level of respiratory protection;
- IDLH atmospheres where the substance or concentration in the air does not present a severe skin hazard;
- the type and concentrations of toxic substances do not meet the selection criteria permitting the use of air purifying respirators; and
- it is highly unlikely that the work being done will generate high concentrations of vapors, gases or particulates, or splashes of materials that will affect the skin of personnel.

Personal protective equipment for Level B includes:

- open circuit, pressure-demand SCBA;
- chemical protective clothing:
- overalls and long-sleeve jacket; or
- coveralls;
- gloves, inner (surgical type); gloves, outer, chemical protective;
- boots, chemical protective, steel toe and shank; and
- communications optional.

3.5.3 Level C Protection

Level C protection is utilized when both skin and respiratory hazards are well defined and the criteria for the use of negative pressure respirators have been fulfilled (i.e., known contaminants and contaminant concentrations, acceptable oxygen levels, approved filter/cartridge available, known cartridge service life, etc.). Level C protection may require carrying an emergency escape respirator during certain initial entry and site reconnaissance situations, or when applicable thereafter.

Personal protective equipment for Level C typically includes:

- full facepiece air-purifying respirator;
- emergency escape respirator (optional);
- chemical protective clothing:
  - overalls and long-sleeved jacket; or
  - coveralls;
- gloves, inner (surgical type);
- gloves, outer, chemical protective; and
- boots, chemical protective, steel toe and shank.

3.5.4 Level D Protection

Level D is the basic work uniform. Personal protective equipment for Level D includes:

- coveralls;
- safety boots/shoes;
- eye protection;
- hand protection;
- reflective traffic safety vest (mandatory for traffic areas or railyard);
- hard hat (with face shield is optional); and
- emergency escape respirator is optional.

3.5.5 Level E Protection

Level E protection is used when radioactivity above 10 mr/hr is detected at the site. Personal protective equipment for Level E includes:

- coveralls;
- air purifying respirator;
- time limits on exposure;
- appropriate dermal protection for the type of radiation present; and
- radiation dosage monitoring.

3.5.6 Additional Considerations

Field work will contain a variety of situations due to chemicals in various concentrations and combinations. These situations may be partially ameliorated by following the work practices listed below:

1. Some sort of foot protection is needed on a site. If the ground to be worked on is contaminated with liquid and it is necessary to walk in the chemicals, some sort of protective "booties" can be worn over the boots. This cuts down on decontamination requirements. They are designed with soles to help prevent them from slipping around. If non-liquids are to be encountered, a Tyvek™ bootie could be used. If the ground contains any sharp objects, the advantage of booties is questionable. Boots should be worn with either cotton or wool socks to help absorb the perspiration.

2. If the site situation requires the use of hard hats, chin straps should be used if a person will be stooping over where his/her hat may fall off. Respirator straps should not be placed over the hard hats. This will affect the fit of the respirator.

   Some types of protective materials conduct heat and cold readily. In cold conditions, natural material clothing should be worn under the protective clothing. Protective clothing should be removed prior to allowing a person "to get warm". Applying heat, such as a space heater, to the outside of the protective clothing may drive the contaminants through. In hot weather, under clothing will absorb sweat. It is recommended that workers use all cotton undergarments.

3. Body protection should be worn and taped to prevent anything from running into the top of the boot. Gloves should be worn and taped to prevent substances from entering the top of the glove. Duct tape is preferred, but masking tape can be used. When aprons are used, they should be taped across the back for added protection. However, this should be done in such a way that the person has mobility.

4. Atmospheric conditions such as precipitation, temperature, wind direction, wind velocity, and pressure determine the behavior of contaminants in air or the potential for volatile material getting into the air. These parameters should be considered in determining the need for and the level of protection.

5. A program must be established for periodic monitoring of the air during site operations. Without an air monitoring program, any changes would go undetected and might jeopardize response personnel. Monitoring can be done with various types of air pumps and filtering devices followed by analysis of the filtration media; personnel dosimeters; and periodic walk-throughs by personnel carrying real-time survey instruments.

6. For operations in the exclusion zone, different levels of protection may be selected, and various types of chemical-resistant clothing may be worn. This selection should be based on the job function, reason for being in the area, and the potential for skin contact with, or inhalation of, the chemicals present.

7. Escape masks must be readily available when levels of respiratory protection do not include a SCBA and the possibility of an IDLH atmosphere exists. Their use can be made on a case-by-case basis. Escape masks could be strategically located at the site in areas that have higher possibilities of vapors, gases or particulates.

APPENDIX G

COVID-19 Interim Health and Safety Guidance

COVID-19 INTERIM HEALTH AND SAFETY GUIDANCE

CORPORATE HEALTH AND SAFETY MANAGER	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**03/2020**
REVISION DATE	:	**05/04/2020**
REVISION NUMBER	:	**3**

TABLE OF CONTENTS

APPENDICES

1. PURPOSE

This guidance has been implemented to establish work practices, administrative procedures, and engineering controls to minimize potential exposure to SARS-CoV-2, the virus that causes COVID-19. The following guidance has been developed based on local, state and federal recommendations/requirements regarding COVID-19. The purpose of this document is to supplement existing site-specific Health and Safety Plans (HASPs) and provide interim health and safety guidance to minimize potential exposure to SARS-CoV-2. Should additional scientific information or regulatory information change, this document shall be updated accordingly.

2. SCOPE AND APPLICABILITY

This guidance covers all Roux employees and the subcontractors that Roux oversees. Site specific HASPs shall be developed to incorporate elements of mitigative measures against COVID-19 exposure. If work cannot be carried out in compliance with this guidance, the project shall be further evaluated by the Project Principal (PP), Office Manager (OM), and Corporate Health and Safety Manager (CHSM) prior to work authorization.

3. BACKGROUND

What is COVID-19?

COVID-19 is a respiratory illness that can spread from person to person. The virus that causes COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China. This virus continues to spread internationally and within the United States. There is currently no vaccine to prevent COVID-19.

What are the symptoms of COVID-19?

Reported illnesses have ranged from mild symptoms to severe illness and death for confirmed COVID-19 cases. Symptoms may appear 2 to14 days following exposure to the virus. People with these symptoms or combinations of symptoms may have COVID-19:

- Cough
- Shortness of breath or difficulty breathing

Or at least two of these symptoms:

- Fever
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

If someone develops emergency warning signs for COVID-19, they should be instructed to get medical attention immediately. Emergency warning signs can include those listed below; however, this list is not all inclusive. Please consult your medical provider for any other symptoms that are severe or concerning.

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion or inability to arouse
- Bluish lips or face

How does COVID-19 spread?

Person-to-person spread

The virus is thought to spread mainly from person-to-person contact.

- Between people who are in close contact with one another (within about 6 feet).
- Through respiratory droplets produced when an infected person coughs, sneezes or talks.
  - These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.
- Some recent studies suggested that COVID-19 may be spread by people who are not showing symptoms.

Spread from contact with contaminated surfaces or objects

It also may be possible that a person can get COVID-19 by touching a contaminated surface or object and then touching their mouth, nose, or possibly their eyes. Based on current data, this is not thought to be the main way the virus spreads.

According to the Centers for Disease Control and Prevention (CDC), people are thought to be most contagious when they are most symptomatic; however, there is a possibility for the virus to spread before an individual shows symptoms (asymptomatic).

How easily the virus spreads

How easily a virus spreads from person-to-person can vary. Several viruses, such as measles, are highly contagious while others do not spread as easily. Based on current data, COVID-19 spreads very easily and sustainably between people and suggests the virus is spreading more efficiently compared to influenza, but not as efficiently as measles.

4. TRAINING REQUIREMENTS

All employees with potential exposure to COVID-19 shall be provided training that incorporates COVID-19 exposure mitigation strategies, such as implementation of proper social distancing, personal hygiene (e.g., handwashing), as well as disinfection procedures, as outlined by CDC guidelines.

5. EXPOSURE RISK POTENTIAL

Worker risk of occupational exposure to COVID-19 can vary from very high, high, medium, or lower (caution) risk. This level of exposure is dependent on several factors, which can include industry type; need for contact within 6 feet of people known to be or suspected of being infected with COVID-19; density of work environment; and industrial setting (i.e., healthcare building, occupied interior work area, minimal ventilation).

Provided below is background risk level information taken from the U.S. Department of Labor Occupational Safety and Health Administration Guidance on preparing workplaces for COVID-19. Risk evaluations for each project shall be conducted by the PP and OM in consultation with the CHSM to ensure Roux employees and subcontractors remain within the lower exposure (caution) category. If it is identified there is a medium exposure risk or higher, further evaluation and mitigative measures shall be evaluated to reduce overall exposure risk prior to work authorization.

Very High Exposure Risk (Activities not conducted by Roux)

Very high exposure risk includes occupations/work activities with high potential for exposure to known or suspected sources of COVID-19 during specific medical, postmortem, or laboratory procedures. This can include but is not limited to:

- Healthcare workers (e.g., doctors, nurses, dentists, paramedics, emergency medical technicians) performing aerosol-generating procedures (e.g., intubation, cough induction procedures, bronchoscopies, some dental procedures and exams, or invasive specimen collection) on known or suspected COVID-19 patients.
- Healthcare or laboratory personnel collecting or handling specimens from known or suspected COVID-19 patients (e.g., manipulating cultures from known or suspected COVID-19 patients).
- Morgue workers performing autopsies, which generally involve aerosol-generating procedures on the bodies of people who are known to have, or suspected of having, COVID-19 at the time of their death.

High Exposure Risk (Activities not conducted by Roux)

High exposure risk occupations/work activities include exposure to known or suspected COVID-19 positive individuals. This can include but not limited to:

- Healthcare delivery and support staff (e.g., doctors, nurses, and other hospital staff who must enter patients' rooms) exposed to known or suspected COVID-19 patients. (Note: when such workers perform aerosol-generating procedures, their exposure risk level becomes very high.)
- Medical transport workers (e.g., ambulance vehicle operators) moving known or suspected COVID-19 patients in enclosed vehicles.
- Mortuary workers involved in preparing (e.g., for burial or cremation) the bodies of people who are known to have, or suspected of having, COVID-19 at the time of their death.

Medium Exposure Risk

Medium exposure risk occupations/work activities include those that require frequent and/or close contact with (i.e., within 6 feet of) people who may be infected with COVID-19, but who are not known or suspected to be COVID-19 positive. For most of our worksites, it is assumed there is on-going community transmission for COVID-19. Therefore, workers who work at sites and may have contact with the general public, other contractors, high-population-density work environments (i.e., greater than 10 people) fall within medium exposure risk group category. This can include, but is not limited to, sampling events that require two or more workers to collect and log samples in close contact or work occurring in an interior space with limited ventilation and several workers present.

Lower Exposure Risk (Caution)

Lower exposure risk (caution) occupations/work activities are those that do not require contact with people known to be or suspected of being COVID-19 positive. During these activities, there is limited contact (i.e., within 6 feet of) the general public or other workers. Workers in this category have minimal occupational contact with the public and other coworkers. This can include construction oversight that does not require close contact as well as sampling or gauging events performed by one worker.

6. EXPOSURE/SUSPECTED EXPOSURE

What do I do if I am sick or come into close contact with someone who is sick (e.g. living with/caring for)?

If you or others you are living with/caring for experience any of the following symptoms, such as acute respiratory illness (i.e., cough, shortness of breath or difficulty breathing), chills, repeated shaking with chills, muscle pain, headache, sore throat, new loss of taste or smell or fever (100.4 °F [37.8 °C]), we ask you not report to your office/field site and stay home. Employees shall notify the OM immediately so proper notifications can be made.

Additionally, if you have come into close contact (i.e., within about 6 feet for at least 15 minutes) with someone who is experiencing COVID-19-like symptoms, please notify the OM immediately. Information provided shall be used to determine appropriate internal response in consultation with the CHSM and Human Resources Director (HRD).

What if I am asked to self-isolate at home and when can I return from home isolation?

Depending on the situation, if you are COVID-19 positive or suspected to have COVID-19, employees may be required to self-isolate in their homes as per CDC or local health department guidance. As per CDC guidance, return from isolation has been broken out into two categories. The first includes confirmed or suspected COVID-19 individuals exhibiting symptoms and the second includes those who have not had COVID-19 symptoms (i.e., asymptomatic) but tested positive and are under self-isolation. Both categories, along with strategies to return from home isolation, are outlined below.

People with COVID-19 under isolation[1]:
Options include a symptom-based (i.e., time-since-illness-onset and time-since-recovery strategy) or a test-based strategy.

1) Symptom-based strategy

If you have not had a test to determine if you are still contagious, you can leave home after these three things have happened:

- At least 3 days (72 hours) have passed since recovery defined as resolution of fever without the use of fever-reducing medications; and
- improvement in respiratory symptoms (e.g., when your cough or shortness of breath have improved); and
- at least 10 days have passed since symptoms first appeared.

2) Test-based strategy

If you will be tested to determine if you are still potentially contagious, you can leave home after these three things have happened:

- Resolution of fever without the use of fever-reducing medications; and
- improvement in respiratory symptoms (e.g., when your cough or shortness of breath have improved); and
- you received two negative tests in a row, at least 24 hours apart. Your doctor shall follow CDC guidance.

People who have not had COVID-19 symptoms but tested positive and are under isolation[1]:
Options include both a time-based or test-based strategy.

1) Time-based strategy

If you have not had a test to determine if you are still contagious, you can leave home after these two things have happened:

- At least 10 days have passed since the date of their first positive COVID-19 diagnostic test; and
- you continue to have no symptoms (no cough or shortness of breath, etc.) since the positive COVID-19 diagnostic test.

2) Test-based strategy

If you have had a test to determine if you are still contagious, you can leave home after:

- You received two negative tests in a row, at least 24 hours apart. Your doctor shall follow CDC guidance.

Test-based strategies

Previous recommendations for a test-based strategy remain applicable; however, a test-based strategy is contingent on the availability of ample testing supplies and laboratory capacity as well as convenient access to testing.

[1] In all cases, follow the guidance of your healthcare provider and local health department. The decision to stop home isolation should be made in consultation with your healthcare provider and state and local health departments. Local decisions depend on local circumstances.

7. WORKPLACE CONTROLS

During the project planning phase, worksite evaluations shall be carried out by the PP and OM in consultation with the CHSM to determine risk exposure levels for work activities. If it is determined there is a medium exposure risk level or higher, additional workplace controls shall be evaluated and implemented as required in addition to the basic infection prevention measures outlined below in Section 8. Additional workplace controls can include engineering controls (i.e., ventilation, physical barriers), administrative controls (i.e., minimizing contact between workers, rotating shifts, site specific training), and additional personal protective equipment (i.e., respiratory protection). If exposure risk cannot be mitigated, potential project postponement may be necessary at the discretion of the OM in consultation with the CHSM.

A Job Safety Analysis (JSA) has been developed and is provided in Appendix B which summarizes and applies concepts within this guidance including the infection prevention measures listed below. This JSA shall be required for all field work in areas where there is community-based transmission of COVID-19.

8. INFECTION PREVENTION MEASURES

The following is basic infection prevention and personal hygiene practices which shall be implemented for all Roux field activities as well as in the office setting.

- ***Personal Hygiene***
  - Wash your hands often with soap and water for at least 20 seconds.
    - If soap and water are not available, use an alcohol-based sanitizer that contains at least 60% ethanol or 70% isopropanol.
    - Key times to wash your hands include after blowing your nose, coughing or sneezing, after using the restroom, and before eating or preparing food.
  - Do not touch your eyes, face, nose and mouth with unwashed hands.
  - Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow.
  - Throw potentially contaminated items (e.g., used tissues) in the trash.
- ***Avoid Close Contact/Secondary Contact with People and Potentially Contaminated Surfaces***
  - Apply appropriate social distance (6+ feet).
  - Stop handshaking—use and utilize other noncontact methods for greeting.
  - Do not work in areas with limited ventilation with other Site workers (e.g., small work trailer which lacks HVAC system). If working in a trailer, the following conditions must be met: limited to 4 workers, large enough to have the ability to apply social distance, and has open windows and/or operational HVAC to ensure proper ventilation of the workspace.
  - Morning tailgate/safety meetings shall occur outside and not within work trailers.
    - Do not require employees or subcontractors to sign in using the same tailgate form. The Site Supervisor/SHSO should record names of those in attendance on the form.
    - If the Site has more than 10 workers, separate tailgate meetings should be performed in smaller groups.
  - Do not share equipment or other items with co-workers and subcontractors unless wearing appropriate PPE (e.g. nitrile gloves). Assume equipment and other surfaces are potentially contaminated and remove gloves aseptically.
  - If receiving labware or other equipment disinfect to the extent feasible. If there are concerns for contaminating labware please wear appropriate PPE (e.g. gloves) to minimize contact.
  - Contact your lab/equipment vendor to confirm equipment is properly disinfected prior to being shipped.
  - Do not carpool with others (e.g. clients, coworkers).

- For company owned vehicles limit sharing of vehicles with coworkers. If unable to limit sharing of company owned vehicles, properly disinfect vehicle before driving with a focus on commonly touched surfaces (e.g. steering wheels, shifters, buttons, etc.).
- Use caution when using public restrooms, portable toilets. Use paper towel as a barrier when touching door handles and faucets.

- ***Cleaning and Disinfecting***
  - Clean and disinfect frequently touched surfaces daily. Commonly touched items can include but are not limited to tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks, and field equipment (i.e., photo-ionization detector, field equipment).
  - **Hard (Non-porous) Surfaces**
    - If surfaces are dirty, they should be cleaned with a detergent/soap and water prior to disinfection.
    - Refer to the manufacturer's instructions to ensure safe and effective use of the product and wear appropriate personal protective equipment (e.g., gloves, safety glasses, face shield).
    - Many products require:
      - Keeping surface wet for a period of time (i.e. contact time)
        - Refer to manufacturer's instructions outlining adequate contact time.
      - Precautions such as wearing gloves and making sure you have good ventilation during use of the product.
    - Disposable gloves should be removed aseptically and discarded after cleaning. Wash hands immediately following removal of gloves. Refer to Appendix A for how to remove gloves aseptically.
    - For disinfection, diluted household bleach solutions, alcohol solutions with at least 70% alcohol, and most common EPA-registered household disinfectants should be effective.
      - Diluted household bleach solutions can be used if appropriate for the surface. Follow manufacturer's instructions for application and proper ventilation. Check to ensure the product is not past its expiration date. Never mix household bleach with ammonia or any other cleanser. Unexpired household bleach will be effective against coronaviruses when properly diluted. Leave the solution on the surface for at least 1 minute.
        - Prepare a bleach solution by mixing:
          - 5 tablespoons (1/3 cup) bleach per gallon of water or
          - 4 teaspoons bleach per quart of water
    - Products with EPA-approved emerging viral pathogen claims are expected to be effective against COVID-19. Follow the manufacturer's instructions for all cleaning and disinfecting products (e.g., concentration, application method and contact time, etc.).
  - **Soft (Porous) Surfaces**
    - For soft (porous) surfaces, remove visible contamination if present and clean with appropriate cleaners indicated for use on the surfaces. After cleaning:
      - Launder items as appropriate in accordance with the manufacturer's instructions. If possible, launder using the warmest appropriate water setting for the item and dry items completely; or
      - Use products with the EPA-approved emerging viral pathogens that claim they are suitable for porous surfaces.
  - **Electronics**
    - For electronics such as tablets, touch screens, keyboards, remote controls, etc. remove visible contamination if present.
      - Follow the manufacturer's instructions for all cleaning and disinfection products.
      - Consider use of wipeable covers for electronics.

- If no manufacturer guidance is available, consider the use of alcohol-based wipes or sprays containing at least 70% alcohol to disinfect touch screens. Dry surfaces thoroughly to avoid pooling of liquids.

- ***Linens, Clothing, and Other Items that Go in the Laundry***
  - Although it is unlikely field clothing would become potentially contaminated with COVID-19, it is recommended that field staff regularly launder field clothing following any field event upon returning home.
  - In order to minimize the possibility of dispersing the virus from potentially contaminated clothing, do not shake dirty laundry.
  - Wash items as appropriate in accordance with the manufacturer's instructions. If possible, launder items using the warmest appropriate water setting for the items and dry items completely.
  - Clean and disinfect hampers or other containers used for transporting laundry according to guidance listed above.

9. CLOTH FACE COVERINGS

The CDC recommends the use of cloth face coverings in public settings where other social distancing measures are difficult to maintain, such as grocery stores and pharmacies, and especially in areas of significant community-based transmission. This recommendation is based on recent studies and an understanding that a significant portion of asymptomatic, as well as pre-symptomatic, individuals can shed the virus to others before showing symptoms. Studies indicate that COVID-19 can spread among people interacting in close proximity through speaking, coughing, or sneezing. The purpose of the cloth covering is NOT to provide protection to the wearer, but to protect the wearer from unknowingly infecting others if they are asymptomatic/pre-symptomatic. The use of cloth face coverings is to supplement and NOT replace the existing practices outlined above.

Based on existing studies and on-going recommendations and/or requirements from federal, state, and local entities, Roux is recommending the use of cloth face coverings, when appropriate. Appropriate use is defined when local authorities or clients require the use of cloth face coverings in conjunction with established social distancing, or if an employee elects to use a cloth covering on their own accord. Roux will provide cloth face coverings that shall meet the basic requirements outlined by the CDC guidance provided in Appendix C: CDC Use of Cloth Face Coverings to Help Slow the Spread of COVID-19.

Cloth Face Coverings should:

- Fit snugly but comfortably against the side of the face;
- Be secured with ties or ear loops, when possible;
- May include multiple layers of fabric;
- Allow for breathing without restriction; and
- Be able to be laundered and machine dried with no damage or change to shape.

When donning and doffing the cloth face covering, individuals should avoid touching their eyes, nose, and mouth. Following removal of the cloth face covering, employees should wash their hands immediately using the guidelines described in Section 8 above. Cloth face coverings should be routinely washed depending on the frequency of use.

The use of existing cloth covering products/materials, such as a scarf, neck gaiter, or bandana, is deemed acceptable by the CDC. Note, the cloth face coverings recommended are not surgical masks or N-95 respirators. Those are critical supplies that must continue to be reserved for healthcare workers and other medical first responders, as recommended by current CDC guidance. Should there be a requirement for workers to be in respiratory protection (e.g. full-face respirator w/cartridges, P100, N95 respirators), it shall be addressed during the project pre-planning phase, which includes discussions with the PP and OM in consultation with CHSM.

10. HOTEL SELECTION PROCESS AND OVERNIGHT/REMOTE WORK

Hotel Selection

Due to the current COVID-19 situation, Roux is recommending overnight travel be limited to the extent possible. If there is a project requiring the overnight stay at a hotel, accommodations shall be made only after the hotel and hotel's location have been vetted in accordance with Roux's established guidance as defined below. The Project Team, which includes the Project Manager (PM) and PP along with the OM, in consultation with the CHSM, shall verify the hotel has appropriate protocols in place to limit the potential exposure and spread of COVID- 19 through proper cleaning and disinfection practices. Discussions with the hotel shall include, but are not limited to, measures taken to keep guests safe during their stay, guest room sanitization schedule, training of staff regarding disinfecting protocols using EPA-approved disinfectants, hotel staff fitness for duty requirements, etc. Following the initial hotel assessment by the Project Team, the OM and the CHSM shall review the hotel assessment findings prior to the CHSM's authorization that the hotel may be used by any Roux employees.

Employees staying overnight should abide by the following guidance:

- Ensure you properly disinfect your room upon arrival. This should include a wipe down of all commonly touched surfaces with an approved disinfectant. Use appropriate PPE (e.g. nitrile gloves) when disinfecting surfaces.
- Place the "Do Not Disturb" placard on the room while away and consider limiting hotel housekeeping service to the extent feasible (e.g., not having the room cleaned each day) to minimize potential secondary contact with others.
- Do not spend any more time in hotel common areas (i.e., lobby, hallways, etc.) than is necessary.
- Follow proper Infection Prevention Measures found within Section 8 above.
- Have meals in your hotel room after disinfecting outer package surfaces, as outlined in Section 8 above. Do not eat in public spaces or restaurants.
- If the hotel has a restaurant or café, do not have your meal in a common area; instead order food to be picked up or delivered to your room. If delivered, opt for contactless delivery (left outside the door, delivery person knocks and leaves). Always use your own pen if you need to sign something.
- Employees may also pick up food from takeout locations, order groceries or food for delivery to the hotel. Call local restaurants to order food for delivery (call the hotel lobby for recommendations) or use food ordering apps. Some apps have options for contactless delivery.

11. TRANSPORTATION-RENTAL CARS AND ROUX-OWNED VEHICLES

Rental Cars

Due to the current COVID-19 situation, Roux recommends rental car usage be limited to the extent possible. If there is a project requiring the use of a rental car (e.g. truck/van), accommodations shall be made only after the rental car company and their store's location have been vetted in accordance with Roux's established guidance, as defined below. The Project Team (PM and PP) and OM in consultation with the CHSM shall verify the rental company where you are picking up your vehicle has appropriate protocols in place to limit the potential exposure and spread of COVID- 19 through proper cleaning and disinfection practices. Discussions with the rental car company shall include, but are not limited to, measures to be taken to keep customers safe during pickup/drop-off, rental car disinfection protocols, training of staff regarding disinfecting protocols using EPA-approved disinfectants, rental car company staff fitness for duty requirements, etc. Following the initial rental car company store assessment by the Project Team, the OM and the CHSM shall review the rental car company assessment findings prior to the CHSM's authorization that the rental car company store may be used by any Roux employees.

Upon vehicle pickup, employees shall don nitrile gloves and safety glasses and clean/disinfect all high-touch surfaces (steering wheel, knobs, door handles, turn signals, radio, etc.) by wiping thoroughly with approved disinfectants (following manufacturer's instructions). Aseptically remove gloves and dispose of them along with

rags/wipes, appropriately. Wash hands or use hand sanitizer immediately after each episode of cleaning. Due to social distancing requirements, personnel shall not carpool to destinations.

Roux-Owned Vehicles

Due to the current COVID-19 situation, Roux-owned vehicles should be dedicated to individual employees to the extent feasible, and if authorized by the OM. In the case this cannot be accommodated, employees shall don nitrile gloves and safety glasses and clean/disinfect all high-touch surfaces (steering wheel, knobs, door handles, turn signals, radio, etc.) by wiping thoroughly with approved disinfectants (following manufacturer's instructions). This cleaning and disinfection shall occur before and after each use of the vehicle. Aseptically remove gloves and dispose of them along with rags/wipes, appropriately. Wash hands or use hand sanitizer immediately after each episode of cleaning. Due to social distancing requirements, personnel shall not carpool to destinations.

APPENDIX A

How to Remove Gloves

How to Remove Gloves

To protect yourself, use the following steps to take off gloves

1

Grasp the outside of one glove at the wrist. Do not touch your bare skin.

2

Peel the glove away from your body, pulling it inside out.

3

Hold the glove you just removed in your gloved hand.

4

Peel off the second glove by putting your fingers inside the glove at the top of your wrist.

5

Turn the second glove inside out while pulling it away from your body, leaving the first glove inside the second.

6

Dispose of the gloves safely. Do not reuse the gloves.

7

Clean your hands immediately after removing gloves.

APPENDIX B

Job Safety Analysis-Working in Areas Affected by COVID-19

JOB SAFETY ANALYSIS	Ctrl. No. CVD-19	DATE: 04/16/2020	☒ NEW ☐ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Fieldwork**	**Working in Areas Affected by Coronavirus**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Kristina DeLuca	Health and Safety Specialist	Brian Hobbs	CHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES – Leather/cut-resistant in field and nitrile as needed
☒ HARD HAT – In field	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☒ PPE CLOTHING – High visibility vest in field	☐ OTHER
☒ SAFETY GLASSES – In field	☒ SAFETY SHOES – Steel/composite toe in fie		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Cloth face covering, nitrile gloves, hand soap, water source, hand sanitizer, disinfectant spray and disinfectant wipes.

Commitment to Safety – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

SOCIAL DISTANCING: Maintain 6' of distance between yourself and all other people at all times. If you do not believe the scope of work can be conducted while maintaining this distance, contact your Project Manager immediately.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Project Preplanning	N/A	• Review and follow COVID-19 CDC, Roux, Client and local orders/protocols. • Ensure all workers are fit for duty - anyone feeling sick should remain at home even if symptoms do not align with COVID-19. If a worker has been in contact with someone potentially positive or positive for COVID-19, contact your Office Manager. • Determine PPE needs and ensure adequate supply of disinfectant wipes/spray, soap and water or hand sanitizer at Site. Due to high demands and limited supply, plan ahead. • Use the minimum number of employees necessary to safely complete the work.
2. Mobilization	**Exposure:** Becoming infected or infecting co-workers	**Personal/Rental/Roux Owned Vehicle** • Do not carpool. • Use the same vehicle every day and do not share with co-workers. • Verify workers/other people are not approaching vehicle prior to exiting the vehicle. Maintain 6' of distance from others. • DO not valet your car or allow others to use your car. If necessary, don nitrile gloves and safety glasses and clean/disinfect all high touch surfaces (steering wheel, knobs, door handles, turn signals, radio, etc.) by wiping thoroughly with approved disinfectants (follow manufacturer's instructions). This cleaning and disinfection shall occur before and after each use of the vehicle. Aseptically remove gloves and dispose of them along with rags/wipes, appropriately. Wash hands or use hand sanitizer immediately after each episode of cleaning. **Public Transportation** • Public transit should not be used unless absolutely necessary. Consider renting a car rather than taking public transit. If public transit is required, wear appropriate PPE and apply social distancing (6 ft). Use proper donning and doffing procedures for nitrile gloves. Wash hands or use hand sanitizer immediately after. **Hotel Stay (Refer to COVID-19 H&S Guidance for more info)** • If a hotel stay is deemed necessary for the given field work, ensure that you disinfect your room upon initial arrival and returning each day. Disinfect all surfaces of your room with an appropriate disinfectant using nitrile gloves. Use proper donning and doffing procedures for nitrile gloves. • Place the "Do Not Disturb" placard on the room while away and limit housekeeping services to the extent feasible during your stay to minimize the reintroduction and spread of the virus from others. Minimize, or avoid entirely, time spent in hotel common areas (i.e., the lobby, dining areas, gyms, etc.). Wash hands or use hand sanitizer often.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards, energy source; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

3. Tailgate Meeting	**Exposure:** Becoming infected or infecting co-workers	• Must occur outside or remotely (i.e. video or conference call). • Maintain at least a 6+ ft distance between you and others. • Discuss primary infection prevention measures listed below. • Do not require employees or subcontractors to sign in, the Site Supervisor shall record names on the attendance form. • If the Site has more than 10 workers, separate tailgate meetings should be performed. • Discuss COVID-19 symptoms with coworkers and subcontractors to ensure fitness for duty. Anyone exhibiting signs or symptoms should be instructed to leave the Site, contact your Project Manager.
4. Site Activities	**Exposure:** Becoming infected or infecting co-workers	• Coordinate field activities at the beginning of the day (i.e. Tailgate meeting) to minimize time spent in crowded spaces or overlap while completing job tasks. • Don cloth face coverings as appropriate. • Apply social distancing (6+ ft) when interacting with others. If anyone comes within 6 ft of you while conducting work and your work prevents you from moving away, politely ask them to move back. If others are unable to move from your space, stop work and leave area. • Do not shake hands or touch others. • Do not share equipment or other items with co-workers and subcontractors unless wearing appropriate PPE (e.g. nitrile gloves). Assume equipment and other surfaces are potentially contaminated and remove gloves aseptically (See Appendix A of Roux Interim H&S Guidance for proper glove removal). • If anyone is coughing or sneezing in your vicinity, stop work and leave the area. • Do not work in areas with limited ventilation with others. • Cover your mouth and nose with tissue or paper towel or with your elbow when coughing or sneezing and wash hands or use hand sanitizer immediately after. If sick contact SHSO/PM and leave Site immediately. • Disinfect work surfaces/areas with approved disinfectant you're responsible for (ex: desk, office doorknob, computer, etc.) at least once at the beginning of your shift and at least once at the end of your shift with either sanitizing wipes or disinfectant spray. • Phones should be operated hands free to extent feasible. Sanitize your phone on a regular basis. Disinfection should also take place whenever suspected contaminated material comes in contact with any work surfaces/areas. Wash hands or use hand sanitizer immediately after. • Avoid public spaces and going out to eat by bringing your own lunch to the Site. If performing work in high density urban areas, it is recommended all food must be consumed at or in your vehicle. Wash hands or use hand sanitizer before eating and immediately after.

Primary Infection Prevention Measures

- Wash your hands often with soap and water for at least 20 seconds.
  - If soap and water are not available, use an alcohol-based sanitizer that contains at least 60% ethanol or 70% isopropanol. Key times to wash hands include after blowing your nose, coughing or sneezing, after using the restroom, and before eating or preparing food.
- Do not touch your eyes, face, nose and mouth with unwashed hands.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw potentially contaminated items (e.g. used tissues) in the trash.
- Avoid close contact/secondary contact with people and potentially contaminated surfaces.
  - Apply appropriate social distance (6+ feet).
  - Stop handshaking/touching others and use caution when accessing public spaces.
- Clean and disinfect frequently touched surfaces daily. Commonly touched items can include but are not limited to tables, doorknobs, light switches, countertops, handles, desks, phones, keyboard, toilets, sinks and field equipment. If surfaces are dirty, they should be cleaned with soap and water prior to disinfection. If surface cannot be cleaned/disinfected, then wash hands or use sanitizer as soon as possible.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

APPENDIX C

Centers for Disease Control (CDC)
Use of Cloth Face Coverings to Help Slow the Spread of COVID-19

Use of Cloth Face Coverings to Help Slow the Spread of COVID-19

How to Wear Cloth Face Coverings

Cloth face coverings should—

- fit snugly but comfortably against the side of the face
- be secured with ties or ear loops
- include multiple layers of fabric
- allow for breathing without restriction
- be able to be laundered and machine dried without damage or change to shape

CDC on Homemade Cloth Face Coverings

CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies), **especially** in areas of significant community-based transmission.

CDC also advises the use of simple cloth face coverings to slow the spread of the virus and help people who may have the virus and do not know it from transmitting it to others. Cloth face coverings fashioned from household items or made at home from common materials at low cost can be used as an additional, voluntary public health measure.

Cloth face coverings should not be placed on young children under age 2, anyone who has trouble breathing, or is unconscious, incapacitated or otherwise unable to remove the cloth face covering without assistance.

The cloth face coverings recommended are not surgical masks or N-95 respirators. Those are critical supplies that must continue to be reserved for healthcare workers and other medical first responders, as recommended by current CDC guidance.

Should cloth face coverings be washed or otherwise cleaned regularly? How regularly?

Yes. They should be routinely washed depending on the frequency of use.

How does one safely sterilize/clean a cloth face covering?

A washing machine should suffice in properly washing a cloth face covering.

How does one safely remove a used cloth face covering?

Individuals should be careful not to touch their eyes, nose, and mouth when removing their cloth face covering and wash hands immediately after removing.

cdc.gov/coronavirus

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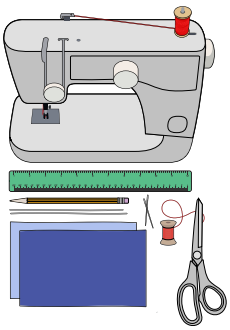
Sewn Cloth Face Covering

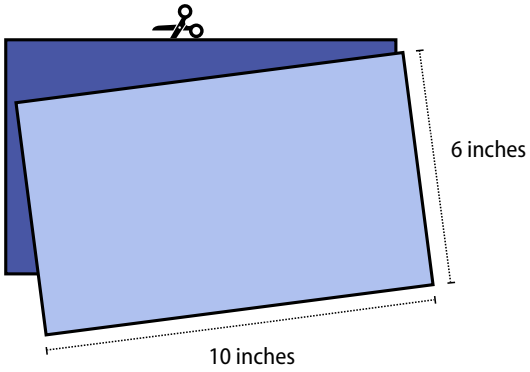
Materials

- Two 10”x6” rectangles of cotton fabric
- Two 6” pieces of elastic (or rubber bands, string, cloth strips, or hair ties)
- Needle and thread (or bobby pin)
- Scissors
- Sewing machine

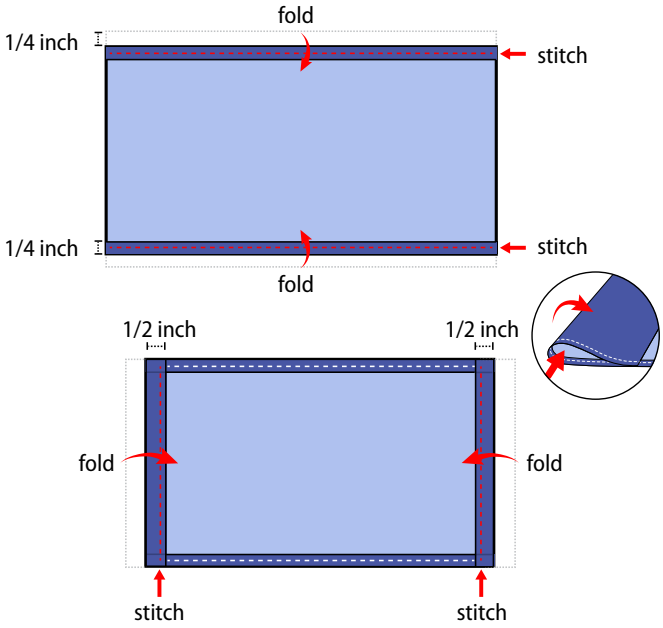


Tutorial

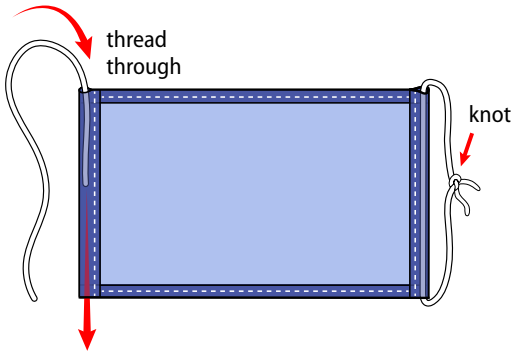
1. Cut out two 10-by-6-inch rectangles of cotton fabric. Use tightly woven cotton, such as quilting fabric or cotton sheets. T-shirt fabric will work in a pinch. Stack the two rectangles; you will sew the cloth face covering as if it was a single piece of fabric.



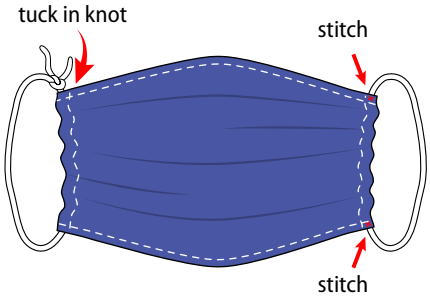
2. Fold over the long sides ¼ inch and hem. Then fold the double layer of fabric over ½ inch along the short sides and stitch down.



3. Run a 6-inch length of 1/8-inch wide elastic through the wider hem on each side of the cloth face covering. These will be the ear loops. Use a large needle or a bobby pin to thread it through. Tie the ends tight.
Don’t have elastic? Use hair ties or elastic head bands. If you only have string, you can make the ties longer and tie the cloth face covering behind your head.



4. Gently pull on the elastic so that the knots are tucked inside the hem.
Gather the sides of the cloth face covering on the elastic and adjust so the mask fits your face. Then securely stitch the elastic in place to keep it from slipping.



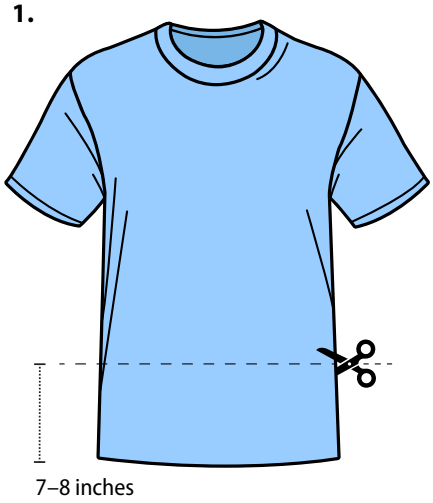
Quick Cut T-shirt Cloth Face Covering (no sew method)

Materials

- T-shirt
- Scissors

Tutorial

1.



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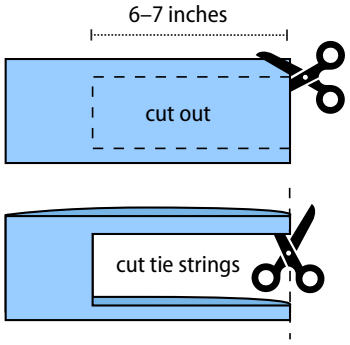

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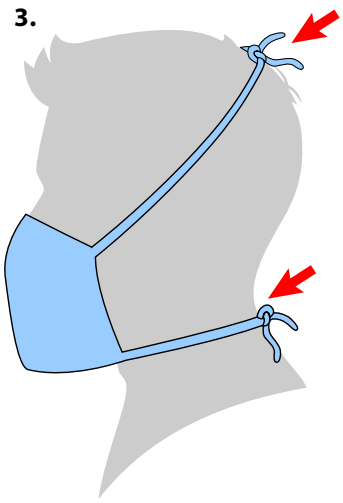


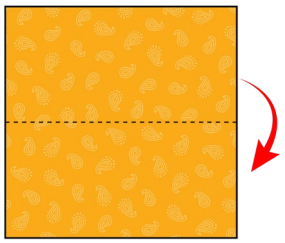
Bandana Cloth Face Covering (no sew method)

Materials

- Bandana (or square cotton cloth approximately 20″x20″)
- Rubber bands (or hair ties)
- Scissors (if you are cutting your own cloth)

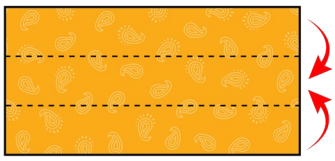
Tutorial

1.



Fold bandana in half.

2.

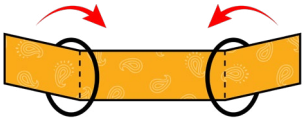


Fold top down. Fold bottom up.

3.

Place rubber bands or hair ties about 6 inches apart.

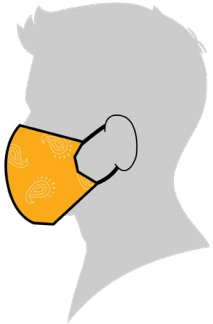
4.



Fold side to the middle and tuck.

5.

6.



APPENDIX F

Quality Assurance Project Plan

Quality Assurance Project Plan

11-20 46th Road
Long Island City, New York

September 16, 2021

Prepared for:

11-20 46th Road Owner LLC
10 East 34th Street, Mezzanine
New York, New York 10016

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Table of Contents

Tables

Appendices

1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of 11-20 46th Road Owner LLC (referred to herein as the Applicant), has prepared this Quality Assurance Project Plan (QAPP) to describe the measures that will be taken to ensure the data generated during performance of the Site Management Plan (SMP) for the 11-20 46th Road Site occupying Tax Block 56, Lot 36, New York, New York (Site) are of quality sufficient to meet project-specific data quality objectives (DQOs).

The Participant entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on June 15, 2020, to investigate and remediate the Site under the Brownfield Cleanup Program (BCP). The Site was assigned BCP Site No. C241242.

This QAPP was prepared in accordance with the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (DER-10) and the United States Environmental Protection Agency's (USEPA's) Guidance for the Data Quality Objectives Process (EPA QA/G 4).

2. Project Objectives and Scope of Work

The objectives of the SMP are to maintain the Track 4 cleanup that was performed under the NYSDEC BCP. A Track 4 remedy will be maintained by implementation of the following tasks:

- Maintenance of a composite cover system as an engineering control (EC);
- Continued operation of a sub-slab depressurization system (SSDS);
- Establishment of an institutional control in the form of an Environmental Easement that will require commissioning of the SSDS under an Site Management Plan (SMP); and
- Development and execution of a Construction Health and Safety Plan (CHASP) and Community Air Monitoring Plan (CAMP) (if necessary) for the protection of on-site workers, the general public, and the environment during remediation and construction activities.

No soil, groundwater or soil vapor sampling is proposed at this time. Indoor air samples will be collected on a biannual basis to show that the SSDS is functioning as an effective EC. Indoor air samples will be analyzed for volatile organic compounds (VOCs) using USEPA Method TO-15 SIM.

3. Project Organization

A general summary of the overall management structure and responsibilities of project team members are presented below. Professional profiles for the team are provided in Appendix A.

Project Principal

Mr. Robert Kovacs, P.G. of Roux will serve as Project Principal. The Project Principal is responsible for defining project objectives and bears ultimate responsibility for the successful completion of the investigation.

Remedial Engineer

The Remedial Engineer for this project will be Mr. David Kaiser, P.E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the Work Plan and future remedial program for the Site. The Remedial Engineer will certify in that the investigation activities were observed by qualified environmental professionals under supervision as well as any other relevant provisions of ECL 27-1419 have been achieved in full conformance with the Work Plan.

Project Manager

Ms. Rachel Henke of Roux will serve as Project Manager. The Project Manager is responsible for defining project objectives and bears ultimate responsibility for the successful completion of the work. This individual will provide overall management for the implementation of the scope of work and will coordinate all field activities. The Project Manager is also responsible for data review/interpretation and report preparation.

Field Team Leader

The Field Team Leader is TBD. The Field Team Leader bears the responsibility for the successful execution of the field program. The Field Team Leader will direct the activities of the technical staff in the field, as well as all subcontractors. The Field Team Leader will also assist in the interpretation of data and in report preparation. The Field Team Leader reports to the Project Manager.

Laboratory Project Manager

Laboratory analysis will be completed by Alpha Analytical Laboratories of Westborough, Massachusetts and Mansfield, Massachusetts, Environmental Laboratory Accreditation Program (ELAP)-certified laboratories (11148 and 11627, respectively). The Laboratory Project Manager is Karyn Raymond. The Laboratory Project Manager is responsible for sample container preparation, sample custody in the laboratory, and completion of the required analysis through oversight of the laboratory staff. The Laboratory Project Manager will ensure that quality assurance procedures are followed, and an acceptable laboratory report is prepared and submitted. The Laboratory Project Manager reports to the Field Team Leader.

Quality Assurance Officer

Jeffrey Wills, P.G. of Roux will serve as the Quality Assurance Officer (QAO) for this project. The QAO is responsible for conducting reviews, inspections, and audits to ensure the data collection is conducted in accordance with the QAPP. The QAO's responsibilities range from ensuring effective field equipment decontamination procedures and proper sample collection to the review of all laboratory analytical data for completeness and usefulness. The QAO reports to the Project Manager and makes independent recommendations to the Field Team Leader.

4. Sample Procedures

The media that may be sampled during the implementation of the RAWP will include indoor air and ambient air. Specifics regarding the collection of samples at each location and for each task are provided in Section 5 of this QAPP.

4.1 Indoor Air and Outdoor Ambient Air Sampling

The proposed sub-slab, indoor air, and ambient air sampling locations are shown on Figure 5 through 8 of the RAWP and described in the table below. All indoor air and ambient air samples will be collected in accordance with the October 2006 New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH Guidance).

Region of Site	Sample Identification	Sample Depth
Indoor Air	The following locations will be sampled during the first year of the SSDS operation: IA-1, IA-2, IA-3, IA-4, IA-5, IA-6, IA-7, IA-8, IA-9, IA-10, IA-12, IA-13, IA-14, IA-F1C, IA-F2C, and IA-F3C. The following locations will be sampled during the subsequent sampling events after the first year of SSDS operation: IA-1, IA-2, IA-4, IA-5, IA-6, IA-9, IA-F1C, IA-F2C, and IA-F3C.	Breathing zone
Ambient Air	AA-1 or AA-2	Outdoor background atmospheric conditions

To the extent practicable, indoor air samples will be placed in well-ventilated and open area typical of the normal working environment. Samples will be analyzed at a NYSDOH Environmental Laboratory Approval Program-certified laboratory using USEPA Method TO-15 for VOCs. All sub-slab vapor, indoor air, and outdoor ambient air samples will be collected using pre-cleaned (batch certified) 2.7-liter summa canisters with regulators calibrated to collect samples over an 8-hour period.

The outdoor ambient air sample (AA-1 or AA-2) will be collected concurrently with the indoor air samples. The outdoor ambient air sample will serve to better define the background atmospheric conditions within the area of the Site. This canister will be placed in a location chosen to provide representative background results based on conditions at the time of sampling. The ambient air will be sampled concurrently with the indoor air samples and by utilizing the same sample collection methods and equipment.

5. Field Sampling Procedures

This section provides a detailed discussion of the field procedures to be used during sampling of the various media being evaluated as part of the Investigation (i.e. soil, groundwater, sub-slab vapor, indoor air, and outdoor ambient air). As discussed, the sample locations are shown on Figures 5 through 8 of the RAWP and additional information, including intervals to be sampled and sample rationale is provided. Additional details regarding sampling procedures and protocols are described in Roux's relevant Standard Operating Procedures (SOPs), which are provided in Appendix B.

5.1 Indoor Air and Ambient Air Sampling

Indoor air and ambient air samples will be collected during the Investigation to gain an understanding of current indoor air quality and to evaluate if the SSDS is operating as designed and functioning as an effectice EC. To the extent practicable, indoor air sample canisters will be placed in a well-ventilated and open area typical of the normal working environment. The indoor air samples will be collected using pre-cleaned 2.7-liter summa canisters with regulators calibrated to collect samples over an 8-hour period and analyzed using USEPA Method TO-15 SIM for VOCs.

One ambient air sample will be collected outside the building to characterize Site-specific background outdoor air conditions and to evaluate the potential influence, if any, of outdoor air on the indoor air sample. The outdoor ambient air samples will be collected outside the building within the Site bounds. The outdoor ambient air will be sampled concurrent with the indoor air samples and by utilizing the same sample collection methods and equipment. The outdoor ambient air sample (AA-1 or AA-2) will be collected concurrently with the sub-slab vapor and indoor air samples. The ambient air sample will be collected using a pre-cleaned 2.7-liter summa canister with a regulator calibrated to collect the sample over an 8-hour period and analyzed using USEPA Method TO-15 SIM for VOCs. This canister will be placed in a location chosen to provide representative background results based on conditions at the time of sampling.

6. Sample Handling and Analysis

To ensure quality data acquisition and collection of representative samples, there are selective procedures to minimize sample degradation or contamination. These include procedures for preservation of the samples, as well as sample packaging, shipping procedures, and QA/QC.

6.1 Field Sample Handling

A discussion of the proposed number and types of samples to be collected during each task, as well as the analyses to be performed, can be found in Section 4 of this QAPP. The types of containers, volumes, and preservation techniques for the aforementioned testing parameters are presented in Table 3.

6.2 Sample Custody Documentation

The purpose of documenting sample custody is to ensure the integrity and handling of the samples is not subject to question. Sample custody will be maintained from the point of sampling through the analysis (and return of unused sample portions, if applicable).

Each individual collecting samples is personally responsible for the care and custody of the samples. All sample labels should be pre-printed or filled out using waterproof ink. The technical staff will review all field activities with the Field Team Leader to determine whether proper custody procedures were followed during the fieldwork and to decide if additional samples are required.

All samples being shipped offsite for analysis must be accompanied by a properly completed chain of custody form. The sample numbers will be listed on the chain of custody form. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to/from a secure storage area, and to the laboratory.

Samples will be packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate signed custody record enclosed in each sample box or cooler. Shipping containers will be locked and/or secured with strapping tape in at least two locations for shipment to the laboratory.

6.3 Sample Shipment

Laboratory analysis will be completed by Alpha Analytical Laboratories of Mansfield, Massachusetts, a NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratory (11627). Sample packaging and shipping procedures are based upon USEPA specifications, as well as DOT regulations. The procedures vary according to potential sample analytes, concentration, and matrix and are designed to provide optimum protection for the samples and the public. Sample packaging and shipment must be performed using the general outline described below.

All samples will be shipped within 24 hours of collection and will be preserved appropriately from the time of sample collection. A description of the sample packing and shipping procedures is presented below:

1. Prepare cooler(s) for shipment:
    - tape drain(s) of cooler shut;
    - affix “This Side Up” arrow labels and “Fragile” labels on each cooler; and

- place mailing label with laboratory address on top of cooler(s).

2. Arrange sample containers in groups by sample number.
3. Ensure all bottle labels are completed correctly. Place clear tape over bottle labels to prevent moisture accumulation from causing the label to peel off.
4. Arrange containers in front of assigned coolers.
5. Place packaging material appropriately at the bottom of the cooler to act as a cushion for the sample containers.
6. Arrange containers in the cooler so they are not in contact with the cooler or other samples.
7. Fill remaining spaces with packaging material.
8. Ensure all containers are firmly packed in packaging material.
9. If ice is required to preserve the samples, ice cubes should be repackaged in Ziploc™ bags and placed on top of the packaging material.
10. Sign chain of custody form (or obtain signature) and indicate the time and date it was relinquished to courier as appropriate.
11. Separate chain of custody forms. Seal proper copies within a large Ziploc™ bag and tape to inside cover of cooler. Retain copies of all forms.
12. Close lid and latch.
13. Secure each cooler using custody seals.
14. Tape cooler shut on both ends.
15. Relinquish to overnight delivery service as appropriate. Retain air bill receipt for project records. (Note: All samples will be shipped for "NEXT A.M." delivery).

6.4 Quality Assurance/Quality Control

Josh Cope of Roux Associates, Inc. will review the analytical data for quality assurance and quality control in accordance with NYSDEC standards. The professional profile for Josh Cope is provided in Appendix A. A laboratory SOP for analysis of PFAS is included in Appendix B.

The primary DQO of the indoor air and ambient air programs is that data be accurate and precise, thus, representative of the actual Site conditions. Accuracy refers to the ability of the laboratory to obtain a true value (i.e., compared to a standard) and is assessed through the use of laboratory quality control (QC) samples, including laboratory control samples and matrix spike samples, as well as through the use of surrogates, which are compounds not typically found in the environment that are injected into the samples prior to analysis. Precision refers to the ability to replicate a value and is assessed through both field and laboratory duplicate samples.

Sensitivity is also a critical issue in generating representative data. Laboratory equipment must be of sufficient sensitivity to detect target compounds and analytes at levels below NYSDEC standards and guidelines whenever possible. Equipment sensitivity can be decreased by field or laboratory contamination of samples, and by sample matrix effects. Assessment of instrument sensitivity is performed through the analysis of reagent blanks, near-detection-limit standards, and response factors. Potential field and/or laboratory contamination is assessed through use of trip blanks, method blanks, and equipment rinse blanks (also called "field blanks").

Table 1 lists the requirements for field and laboratory QC samples that will be analyzed to assess data accuracy and precision, as well as to determine if equipment sensitivity has been compromised. Table 2 lists the number/type of field and QA/QC samples that will be collected during the RAWP. Table 3 lists the preservation, holding times and sample container information.

All Investigation "assessment" analyses (i.e., TO-15) will be performed in accordance with the NYSDEC Analytical Services Protocol (ASP), using USEPA SW 846 methods.

All laboratory data are to be reported in NYSDEC ASP Category B deliverables and will be delivered to NYSDEC in electronic data deliverable (EDD) format as described on NYSDEC's website (http://www.dec.ny.gov/chemical/62440.html) and recent updated procedures enacted in November 2018. A Data Usability Report will be prepared meeting the requirements in Section 2.2(a)1.ii and Appendix 2B of DER-10 for all data packages generated for the RI. The DUSR will be prepared by Josh Cope of Roux Associates Inc., a third-party data validator. Validator resume is included in Appendix A.

7. Site Control Procedures

Site control procedures, including decontamination and waste handling and disposal, are discussed below. Site control procedures have been developed to minimize both the risk of exposure to contamination and the spread of contamination during field activities at the Site. All personnel who come into designated work areas, including contractors and observers, will be required to adhere strictly to the conditions imposed herein and to the provisions of a Site-Specific Health and Safety Plan (HASP). The HASP is included as Appendix C of the RAWP.

7.1 Decontamination

In an attempt to avoid the spread of contamination, all sampling equipment must be decontaminated at a reasonable frequency in a properly designed and located decontamination area. Detailed procedures for the decontamination of field and sampling equipment are included in Roux's SOPs for the Decontamination of Field Equipment located in Appendix B. The location of the decontamination area will be determined prior to the start of field operations. The decontamination area will be constructed to ensure that all wash water generated during decontamination can be collected and containerized for proper disposal.

7.2 Waste Handling and Disposal

All waste materials (drill cuttings, decontamination water, etc.) generated during the Investigation will be consolidated, and stored in appropriate labeled bulk containers (drums, etc.), and temporarily staged at an investigation derived waste storage area on-site. Roux will then coordinate waste characterization and disposal by appropriate means.

Respectfully submitted,

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.

Robert Kovacs, P.G.
Principal Scientist

TABLES

Table 1. Field and Laboratory QC Summary

QC Check Type	Minimum Frequency	Use
Field QC		
Duplicate	1 per matrix per 20 aqueous samples	Precision
Trip Blank	2 per matrix per 20 samples	Sensitivity
Field Blank (non-PFAS)	1 per matrix per 20 samples	Sensitivity
Field Blank (PFAS)	1 per matrix per 20 samples or 1 per day, whichever is more frequent	Sensitivity
Laboratory QC		
Laboratory Control Sample	1 per matrix per SDG	Accuracy
Matrix Spike/Matrix Spike Duplicate/Matrix Duplicate**	1 per matrix per SDG	Accuracy/Precision
Surrogate Spike	All organics samples	Accuracy
Laboratory Duplicate	1 per matrix per SDG	Precision
Method Blank	1 per matrix per SDG	Sensitivity

Notes:

* SDG - Sample Delivery Group - Assumes a single extraction or preparation

** Provided to lab by field sampling personnel

Table 2. Investigation Sampling Summary

Sample Medium	Target Analytes	Field Samples*	Replicates[1]	Trip Blanks[2]	Field Blanks[1]	Matrix Spikes[1]	Spike Duplicates[1]	Total No. of Samples
Indoor Air, Ambient Air	TO-15 VOCs	9	1	-	-	-	-	10

Totals are estimated based on scope of work as written, actual sample quantities may vary based on field conditions. QA/QC sample quantities will be adjusted accordingly.

[1] Based on 1 per 20 samples

[2] Based on 1 per 20 samples

USEPA - United States Environmental Protection Agency

VOCs - Volatile Organic Compounds

*Denotes samples to be collected following the first year of SSDS operation.

Table 3. Preservation, Holding Times and Sample Containers

Analysis	Matrix	Bottle Type	Preservation	Holding Time(a)
TO-15	Air	2.7 liter Summa Canister	None	14 days from sample collection
Target Compound List (TCL)/Part 375				

(a) Days from date of sample collection.

APPENDICES

A. Professional Profiles

B. Standard Operating Procedures, Laboratory Detection Limits for Emerging Contaminants and NYSDEC Guidance for Sampling Emerging Contaminants

APPENDIX A

Professional Profiles

ROUX

PROFESSIONAL PROFILE

Robert Kovacs, LSRP, P.G.

Principal Scientist

TECHNICAL SPECIALTIES

Design, implementation and management of Environmental Site Assessments, Remedial Investigations, and Remedial Actions at Industrial, and Brownfield redevelopment sites; Characterization, Decontamination and Decommissioning of Industrial Manufacturing Facilities.

EXPERIENCE SUMMARY

Eighteen years of experience: Senior, Project, Staff and Staff Assistant Environmental Scientist at Roux Associates, Inc., Islandia, New York; Field Manager/Staff Scientist at Long Island Analytical Laboratories, Holbrook, New York.

CREDENTIALS

B.A., Biological Sciences, University of Delaware, Newark, Delaware, 1999

Licensed Site Remediation Professional, New Jersey (License No. 627589)

New York State Professional Geologist (License No. 000437)

OSHA 40-Hour Health and Safety Course (29 CFR 1910.120)

OSHA 8-Hour Health and Safety Refresher Course (29 CFR 1910.120)

NJDEP UST Certification Program-Subsurface Evaluator (License No. 239024)

PUBLICATIONS

Significant Acceleration of Time Frame to Closure via Transition from Long-Term Biological Treatment to ZVI/EVO Injection, Kovacs, R., Senh, S., Silverstein, W., Moss, D., Kelley, R., Proceedings of the Tenth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Abstract and Poster, 2016.

KEY PROJECTS

Industrial/Brownfields Projects

- *Amtrak Sunnyside Yard State Superfund Site* – Project Principal for multiple projects to support investigation and remediation activities at this State Superfund site. I was responsible for overseeing activates in all six Operable Units (OUs), including unsaturated and saturated soil, groundwater, separate-phase hydrocarbon, soil vapor and on-site sewer system. My responsibilities on these projects included characterizing subsurface conditions, including soil (collected hundreds of soil samples to characterize the 130+ acre active railyard), as well as characterizing a 250,000-gallon PCB-contaminated separate-phase hydrocarbon plume. Additionally, I was responsible for overseeing the design and implementation of remediation activities, including soil excavation and offsite disposal, removal and abandonment of USTs ranging in sizes up to 17,000 gallons, demolition of contaminated buildings and infrastructure, and installation and operation of a dual phase high vacuum extraction (DPVE) system to recover PCB-contaminated separate-phase hydrocarbon through a network of over 40 recovery wells. Due to the highly volatile nature of the separate-phase hydrocarbon and the urban setting of this site, extensive emissions and odor engineering controls were used when excavating and managing soil and product. Additionally, extensive Community Air Monitoring was completed during all phases of work. I was also responsible for managing environmental activities associated with construction of the new, state of the art Next Generation High Speed Rail facilities to support Amtrak's Acela train service, and construction associated with MTA's massive East Side Access project on and beneath Sunnyside Yard.

- *Pharmaceutical Manufacturing Facility – Brooklyn, NY* – Project Manager/Project Principal for environmental work associated with the seven-block former manufacturing plant. This Site included a former 700,000 square foot manufacturing plant, as well as several other former industrial facilities with operations starting as far back as the 1850's. Responsibilities include the design and completion of multiple phases of subsurface investigations to characterize soil and groundwater quality, as well as soil vapor. Contaminants included hydrocarbons, benzene, PCBs, and heavy metals, including lead, mercury, and arsenic. Work included development and preparation of investigation and remediation work plans, coordination and management of field investigations, including the installation of shallow and deep monitoring wells and soil borings using sonic drilling methods, completion of a geophysical survey, collection of groundwater samples, and management of remediation activities. Remediation activities included soil excavation, UST removals, and the installation of a soil vapor extraction and air sparging system. Work was completed under several different regulatory agencies, including NYSDEC and NYCOER. Also provided presentations to school authorities, including the NYC DOE, to communicate the progress of the project and to educate administrators regarding the Site's environmental issues.

- *Chlorinated Solvent Remediation – Parsippany-Troy Hills, NJ* – Project Principal for the Remedial Investigation and Remedial Action implementation associated with a former dry cleaner release located in Parsippany-Troy Hills, New Jersey. We were retained by one of the largest real estate developers in the United States to complete this project. Soil, groundwater and subsurface vapor were impacted with chlorinated VOCs as a result of the former dry cleaner operations. Responsibilities included the design and management of a Supplemental RI that included the installation of soil borings, monitoring wells and the completion of groundwater vertical profiling. Additionally, I was responsible for the design, implementation and management of an extensive groundwater remediation injection program in which approximately 200,000 pounds of Zero-Valent Iron (ZVI) and 2,500 gallons of Emulsified Vegetable Oil (EVO) were injected into the subsurface using

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pneumatic fracturing. Initial post-treatment results show over 95 percent reduction in concentrations of chlorinated VOCs in groundwater. Additionally, I was responsible for the design, installation and operation of a SVE system to address impacted vadose zone soil.

- *Chlorinated Solvent Release – Bernardsville, NJ* – Project Principal for the investigation of an extensive chlorinated solvent plume emanating from a former dry cleaner site. Contamination from this site has migrated far off site in groundwater, and has potentially impacted nearby surface water. Work includes installation of soil borings and monitoring wells to characterize contamination in soil, perched water, groundwater in the deep unconsolidated aquifer zone, as well as groundwater in the weathered bedrock matrix and bedrock matrix. Further, contamination from the Site is co-mingled with contamination from other solvent release sites, complicating NJDEP negotiations and investigation/remedial requirements. I serve as the LSRP of record for this project.
- *UST Spill Site – Brooklyn, NY* – Project Principal for the investigation of a Spill in Williamsburg, Brooklyn, New York. I lead the project team in successfully demonstrating to NYSDEC's Spills Group that impacts to a deep groundwater zone beneath our client's site were a result of offsite contamination migrating onsite from a nearby active gasoline station (not a result of our client's former industrial operations). Impacts included the presence of several feet of free product in a deep groundwater zone. I was successful in getting our client's Spill Case closed, saving our client from additional investigation activities, and what will likely be a multi-million-dollar remediation to address free product beneath a semi-confining clay zone.
- *Waterfront Redevelopment – Greenpoint, NY* – Project Principal for a large project located on the waterfront in Greenpoint, New York. This 110,000-square foot site will be redeveloped into a multiple 40-story towers. This project has included the completion of a Phase I and Phase II ESA, as well as negotiation with NYSDEC regarding entry to the NYSDEC BCP. As part of this work, soil borings, monitoring wells, piezometers, and soil vapor monitoring points were installed, and hydrogeologic cross sections were prepared. Additionally, as part of this project, the tidal influence of the East River on site groundwater was studied, and a benthic sediment investigation was conducted in the East River.
- *Former Vehicle Maintenance Facility – Parlin, NJ* – Project Manager for the removal of (2) waste oil USTs, a subsurface oil water separator, piping, and remediation of associated petroleum contaminated soil at a former vehicle maintenance facility in Parlin, New Jersey. We were retained by one of the largest real estate developers in the United States to complete this project. This remediation was completed to allow for a new, national tenant to occupy this retail space. As part of this this work it was determined that a historic release occurred from the OWS, triggering a RI for petroleum-related VOCs and chlorinated VOCs in soil. I was also responsible for the development and implementation of the Remedial Action for the Site, which included excavation and off-site soil disposal. SESOIL modeling was also utilized to demonstrate groundwater (approximately 100 feet deep) was not impacted by the shallow soil contamination. As part of this project, I took a lead role in preparing the SI Report, RI Report, RAW, RAR, Receptor Evaluation, and the Unrestricted Use RAO.
- *NJ Transit Active Bus Facility* – Project Principal for the completion of a RI at an active bus garage located in Fairview, New Jersey for a major transit agency. Responsibilities included the delineation of a free product plume, characterization of soil and groundwater quality, report preparation, and correspondence with the NJDEP. Additionally, I was responsible for implementing free-product Interim Remedial Measure efforts. I am currently finalizing the RI report for the Site, and managing the Remedial Action design, and supporting the LSRP in meeting all NJDEP administrative requirements.
- *Residential Hi-Rise Development – Manhattan, NY* – Project Principal for a redevelopment site in mid-town Manhattan working for a private developer who is building a mixed-use retail/commercial tower. Work included a Phase I ESA and Phase II ESA. As part of the Phase II shallow bedrock was identified in portions of the site, and an LNAPL plume was identified in the overburden soils. Responsibilities included bedrock evaluation, LNAPL recovery utilizing multiple different techniques. Responsibilities also included construction support, health and safety support, management of all soil excavated and transported off site, and the design of a Sub-Slab Depressurization System (SSDS) to mitigate vapors in the vadose zone beneath the new building structure that were emanating from groundwater.
- *Ship Dry Dock Facility – Hoboken, NJ* – Project Manager for the completion of a Preliminary Assessment and Site Investigation (PA/SI) at an active ship dry dock facility in Hoboken, New Jersey. Responsible for the coordination and management of field investigation activities, which included soil, groundwater, and sediment sampling, as well as the preparation of a PA and SI report. This work was completed on behalf of a potential buyer of the property who planned to redevelop this site into a New York City ferry terminal.
- *BICC Cables – Yonkers, NY* – Project Manager for the investigation and remediation of the interior and subsurface soils of a former cable manufacturing facility located in Yonkers, New York to be redeveloped into a movie studio. Responsibilities included the completion of several large-scale investigations, including the collection of wipe, soil and building material samples to characterize PCB and lead impacts at this 200,000+ square foot facility.

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Additional tasks included oversight of the remediation of interior surfaces using several different methods for the removal of PCBs and lead, and remediation of a sub-surface drainage trench and process water system. Further work included the preparation of a Remedial Investigation report and a Feasibility Study report for submittal to the NYSDEC.

- *Amtrak Electrical Substation – Rahway, NJ* – Project Manager for the RI and RA design and implementation at an active electrical substation in Rahway, New Jersey for a national passenger railroad agency. Responsibilities included completing an RI to delineate PCBs in soil, and the management of free-product recovery programs. Further, I was responsible for managing the RA at the Site, which included soil excavation and offsite disposal, and free-product recovery. As part of this project, I supported the Site LSRP and took a lead role in preparing the Supplemental RI Report, RAW, RAR, Receptor Evaluation, and the Unrestricted Use RAO. Additionally, I assisted the LSRP in satisfying all NJDEP administrative requirements, including preparation of forms, public notifications, and submittal of fees.
- *Echo Bay Redevelopment – New Rochelle, NY* – Project Manager for the completion of Phase I and Phase II Environmental Site Assessment activities associated with a proposed mixed-use redevelopment located in Westchester, New York. Work included management of subsurface investigation activities to characterize soil conditions, and working closely with client's architects and construction contractors to integrate the proposed site remediation into the project development plan (including evaluating multiple potential disposal scenarios). Site contaminants included hydrocarbons (including free-product plume from former USTs), and historic fill constituents.
- *Former Dry Cleaner – Ramsey, NJ* – Project manager for the SI, RI, and vapor intrusion investigation at a former dry cleaner in Ramsey, New Jersey. Responsibilities included managing and coordinating field investigations, preparing remedial cost estimates for redevelopment, and preparation of reports and satisfying NJDEP Administration requirements. This work is being done to support redevelopment of the Site for a large, national fitness center tenant.
- *Former Service Station* – Project Manager for the implementation of a groundwater remediation injection program to address petroleum contamination at a former service station located in Paterson, New Jersey for a major transit agency. Responsibilities included implementation of a PA and SI to further investigate chlorinated VOCs at this Site. As part of this project, I took a lead role in preparing reports and the Permit-by-Rule Request, as well as assisting in satisfying all NJDEP administrative requirements.
- *NJ Transit Active Railyard* – Project manager for the investigation of a diesel release at an active railyard in Roxbury Township, New Jersey. This release was caused by a faulty underground pipe located in the locomotive fueling area. The diesel release resulted in a free-product plume, groundwater impacts, and impacts to a subsurface drainage culvert and a nearby lake. Responsibilities included the development and coordination of a field investigation program, coordination of routine gauging and free-product recovery events, correspondence with NJDEP, and preparation of a baseline ecological evaluation. Additionally, I supported the Site LSRP in meeting all NJDEP administrative requirements.

Facility Demolition/Decommissioning

- *Former Pharmaceutical Manufacturing Facility Decommissioning – Brooklyn, NY* – Project Manager for the interior decontamination and decommissioning of a 700,000+ square foot former manufacturing facility located in Brooklyn, New York to allow for redevelopment of the building for commercial, retail, and light industrial use, and use as a movie studio, and for local food businesses. This redevelopment has earned significant positive press, as it is considered a highly beneficial reuse for the community. This project included the development of decontamination and decommissioning work plan, technical support of bidding process, and full time onsite engineering support of the entire project.

  Decontamination and decommissioning activities included removal/cleaning of hundreds of air handling units and dust collector units impacted with manufacturing dusts and residues, as well as thousands of feet of intricate vacuum, ventilation and dust collection lines. This project also included the removal of concrete impacted with metals, PCBs, and/or VOCs, selective interior demolition, and decontamination of former laboratory, milling, compounding, blending, and packaging areas, as well as asbestos abatement. At the conclusion of this project, a Final Report was prepared, documenting in detail the extensive work completed and that the work plan objectives were achieved.
- *Former Pharmaceutical Manufacturing Facility Demolition* – Project Manager for the demolition of two former manufacturing buildings in Brooklyn, New York. Both buildings were impacted with hazardous levels of PCBs, mercury and lead. Responsibilities included in situ waste characterization of building materials, oversight of hazardous waste removal, completion of waste manifests, and full-time Community Air Monitoring during all demolition activities. Additionally, Roux Associates performed daily inspections and monitoring to ensure the protection of a nearby elementary school and prepared a completion report at the conclusion of the project.

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Robert Kovacs, LSRP, P.G.
Principal Scientist

- *PCB Building Material Remediation* – Project Manager for the investigation and TSCA remediation of PCB containing paint in a former manufacturing area. This location (approximately 2,000 square feet in area, and two stories in height) was found to contain PCBs in the paint matrix at concentrations as high as 10,000 parts per million. The underlying building material (brick, concrete, and terra cotta) was also found to be impacted with PCBs from the paint. Responsibilities included preparation of a Self-Implementing Notification and Alternative Decontamination Methods and Verification Sampling Work Plan to remediate the PCBs under the TSCA regulatory framework. This project also included providing field oversight of the PCB remediation, completion of the extensive verification sampling program of the underlying porous building material, and collection of confirmation air samples and confirmation wipe samples outside of the exclusion zone to confirm proper function of all critical barriers. Following the successful completion of the project, a Final Report was prepared and submitted to USEPA documenting the entire project in detail.

Expert/Insurance Litigation Support

- Consulting Fact Witness for an insurance litigation claim where insured was seeking to be reinbursed for over $15mm of previuos environmetnal investigation/remedation costs. My responsibilities included a formal deposition and testifying in US District Federal Court – Eastern District of New York. Case resulted in favorable ruling for our client.
- Consulting expert on the Gowanis Canal Superfund Site, Brooklyn, NY. Evalauted all RI data, perfored fate and tranport analysis, and evalaution of historic site operations to support facility *de minimis* status.

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ROUX

PROFESSIONAL PROFILE

David E. Kaiser, P.E.
Senior Engineer

TECHNICAL SPECIALTIES

Engineering services including development and review of design drawings, implementation of design, development of technical specifications, review of construction submittals, development of SWPPPs, field management and site safety of various heavy construction projects, and civil/remediation engineering construction management. Designs have included stormwater drainage systems, NYCDEP sewer system, NYCDOB/DOT sidewalk project, and remedial system design. Additional services including budget management, permitting, project coordination, project scheduling, development of bid packages and cost estimating.

Field management and construction oversight of heavy equipment construction including sewer construction, drainage construction, crane lift activities and remedial construction activities. Environmental site assessments focusing on soil, soil vapor, groundwater and excavation dewatering investigations.

EXPERIENCE SUMMARY

Twelve years of experience: Project Engineer with Roux Environmental Engineering & Geology, D.P.C.; Design Engineer with Bohler Engineering.

CREDENTIALS

B.E. Civil Engineering, Hofstra University, 2006
Fundamentals of Engineering E.I.T. Certification, 2006
Professional Engineer (NY), 2017
OSHA 40-Hour HAZWOPER Training, 2008
OSHA 30-Hour Construction Safety Training, 2011
OSHA 10-Hour Construction Safety Training, 2018
OSHA 8-Hour Hazardous Waste Refresher Training, 2017
LPS 8-Hour Training Certification, 2008
First Aid and CPR Certified, 2016
DOT Hazardous Materials Awareness Training, 2017
NYSDEC Erosion and Sediment Control Training, 2016
Transportation Worker Identification Credential (TWIC)

KEY PROJECTS

- Land Development Site Plan Preparation – Design Engineer for the design and development of residential, commercial and industrial site plan packages for Suffolk County, Nassau County and New York City Boroughs. Site plan packages for the various municipalities within Suffolk County, Nassau County and New York City included components such as: zoning analysis, site removals plan, site design and construction documents, water and sewer system design (detention and retention systems), site grading and drainage plans, and lighting analysis and design.
- Suffolk County Drywell Closure – Senior Engineer for the planning and coordination of closing existing drywell structures serving as sanitary and industrial retention basins for an industrial facility. The project consisted of developing a sampling plan for the site, coordinating sampling and inspection of existing sanitary and industrial drywells in accordance with Suffolk County Department of Health Services Article 12, SOP No. 9-95 Pumpout and Soil Cleanup Criteria. Following the sampling event, a summary of results was prepared and sent to the SCDHS for review. Due to exceedances that were present within the septic tanks, a remedial action work plan was developed to identify the required steps for successful closure, which included coordinating the SCDHS field inspection, extraction of contaminated liquids and solids, and proper disposal of the waste.
- Property Drainage System Design and Construction – Project Engineer for the design and development of a new on-site stormwater treatment system located at a former petroleum terminal in Brooklyn, NY. Design included drainage improvements and modifications for the former petroleum terminal to support ongoing remediation activities that were being conducted to facilitate the future closure of an existing in-ground oil/water separator and removal of associated piping, and to support the anticipated long-term remedy for, and potential future redevelopment of the subject property. The proposed drainage modifications included the installation of new drainage structures, Contech treatment structures and conveyance piping to collect and treat stormwater runoff within the property and bypass the existing in-ground oil/water separator, prior to discharging the stormwater via an existing SPDES outfall.
- Oil/Water Separator Closure – Project Engineer for engineering support and review for the closure of an existing in-ground oil/water separator at a former petroleum terminal in Brooklyn, NY. The closure and abandonment of the oil/water separator was deemed the long-term remedy as approved by the NYSDEC. The oil/water separator was originally constructed in the early 1900s and has served the property by providing stormwater runoff treatment. The closure project includes the following tasks: dewatering and treatment of separator water; excavation of existing sludge in separator; dewatering and drying/stabilization of the sludge removed; power washing of interior; backfill and compaction of clean fill inside separator; removal of all existing above-grade structures including catwalks, guardrails, and piping; proper shipping and disposal of sludge contents; installation of a final cover system consisting of a geosynthetic clay liner (GCL) and filter fabric barrier; and final site grading.
- Treatment System Building Upgrades – Project Engineer for the review and implementation of engineering drawings for a metals removal system

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Senior Engineer

upgrade to an existing 450-gpm groundwater treatment system. The upgrades consisted of: relocating and reinstalling the existing oil/water separator tank on a steel spacer via crane; lifting and installing the existing 10,000 gallon equalization tank to be repurposed as a filter backwash solids removal tank; lifting and installing prefabricated concrete pads with a subbase of Geogrid BX1200 and 6" of aggregate size number 57 (as per NYCDDC Highway Specifications and ASTM C33) compacted to 95% Standard Proctor, under proposed tank locations; locating a new 20,000 gallon equalization/aeration tank on the new pad; installing of new blower motor and enclosure; and installing of new piping and appurtenances.

- NYCDEP Private Storm and Sanitary Sewer System – Project/Staff Engineer for the design and development of a New York City Department of Environmental Protection (NYCDEP) Private Storm and Sanitary Sewer System located at a former petroleum terminal in Brooklyn, NY. The sewer system comprised of over 2,600 LF of sewer in Greenpoint, Brooklyn over two phases of construction. During the duration of this project, responsibilities included: develop/revise NYCDEP sewer design plans and construction notes, address NYCDEP comments and markups, develop Bill of Materials, develop cost estimates, develop technical specifications, develop bid package, ensure compliance with NYCDEP and NYCDOT specifications and requirements, develop/revise NYCDOT Builder's Pavement Plan (BPP), develop NYCDOT Maintenance and Protection of Traffic plans, conduct/participate in design construction meetings, review subcontractor submittals and cut sheets, address NYCDEP punch list items, and management/oversight/coordination of subcontractor construction activities.
- NYCDOB/NYCDOT Sidewalk Installation – Project/Staff Engineer for the design, development, and installation of over 4,000 linear feet of new sidewalks over various phases located at a former petroleum terminal in Brooklyn, NY. The design, development, and installation of these sidewalks were in accordance with the New York City Department of Buildings and New York City Department of Transportation specifications and details of construction. During the duration of these projects, my major responsibilities included: develop/revise NYCDOT Builder's Pavement Plans, develop cost estimates, develop technical specifications, develop bid package, ensure compliance with NYCDOB and NYCDOT specifications and requirements, develop NYCDOT Maintenance and Protection of Traffic plans, conduct/participate in design construction meetings, ensure proper installation and testing of sidewalks in accordance with NYCDOB and NYCDOT, and management/oversight/coordination of subcontractor construction activities.
- Sub Slab Depressurization System – Staff Engineer for the design and construction of two sub slab depressurization systems (SSDS) located within the footprint of a petroleum remediation site where a new building was proposed to be built. These projects were part of an Interim Remedial Measure (IRM) Action Plan as approved by the NYSDEC to provide a preventative proactive measure to address potential soil vapor issues. The SSDSs were designed to operate passively; however, header piping was installed to allow for the installation of the necessary equipment if an active system was required. The SSDSs consisted of ¾-inch gravel with 4-inch diameter polyvinyl chloride (PVC) schedule 40 well screen used as soil gas collection piping and 6-inch diameter solid PVC used as the header piping. A vapor barrier/waterproofing membrane and nonwoven geotextile fabric were installed between the venting layer and the floor slab. All penetrations through the floor slab were sealed using a silicone-based waterproof sealant. The scope of work included excavation and trench work for the SSDS; placement of pipe bedding; jointing and installation of the pipe fittings, valves and appurtenances; installation of pipe sleeves and mechanical seals; and installation of nonwoven geotextile fabric and silicone-based waterproof sealant.
- Stormwater Pollution Prevention Plan (SWPPP) Reports – Staff Engineer for preparing and submitting Stormwater Pollution Prevention Plans (SWPPP) for various residential and commercial development sites in New York City and Long Island. The scope of work included preparation of SWPPP Reports in accordance with the most current New York State Department of Environmental Conservation (NYSDEC) regulations at the time, including the 'General Permit for Stormwater Discharges from Construction Activity' and the 'New York State Stormwater Management Design Manual'. Preparation of the SWPPP Reports included: summarizing the site history and project description, soil geology, potential pollutants, erosion and sediment control practices, inspection and maintenance procedures, water quantity and water quality control plans, construction sequence scheduling, and the Notice of Intent (NOI) for each project as required by the NYSDEC.

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ROUX

PROFESSIONAL PROFILE

Rachel Henke
Project Scientist

TECHNICAL SPECIALTIES

Design, implementation, and management of Remedial Investigations and Remedial Actions for sites in regulatory programs including the United States Environmental Protection Agency Superfund Program, the New York State Brownfield Cleanup Program, and the New York City Office of Environmental Remediation Voluntary Cleanup Program; Management of due diligence Phase I & II Environmental Site Assessments; Preparation and management of Brownfield Cleanup Program Applications, Remedial Investigation Work Plans, Remedial Investigation Reports, Remedial Action Work Plans, and Remedial Action Reports; Investigation and evaluation of petroleum, chlorinated solvent and per- and poly fluoroalkyl substances (PFAS)-related contamination; Management of large-scale soil excavation projects including demolition, waste characterization, and construction activities.

EXPERIENCE SUMMARY

Five years of experience: Project Scientist, Staff Scientist, and Staff Assistant Scientist, Roux, Islandia, New York.

CREDENTIALS

B.S. Earth and Environmental Science, Lehigh University, 2014

B.A. Biology, Lehigh University, 2014

OSHA 40-hour HAZWOPER Training, 2014

OSHA 8-HOUR Refresher Training, Certificate Current

OSHA 10-hour Construction Safety Training, 2015

New York State Builders Association 4-Hour Stormwater Training, 2016

First Aid and CPR Certified

Loss Prevention System (LPS) Awareness, 8-Hour Certified

Transit Worker Identification Credential Card Holder

AMTRAK Contractor Safety and Security Training

KEY PROJECTS

- Project manager for an approximately 65,000 square foot property enrolled in the New York State Brownfield Cleanup Program in Bronx, New York. The Site formerly operated as a retail gasoline and service station and a dry cleaner. Responsibilities included management of the Remedial Investigation, which involved groundwater sampling for emerging contaminants (PFAS and 1,4-dioxane) development of a Health and Safety Plan, and preparing a Remedial Investigation Report/Remedial Action Work Plan, Fact Sheets, and Monthly Reports. Performance of Community Participation Plan requirements. Coordination and management of field crews, environmental subcontractors, equipment vendors, and laboratories involved on the project. Current redevelopment plans include a mixed-use development with parking and limited landscaping.
- Project Manager for an inactive solid waste landfill site in upstate New York that was investigated under the NYSDEC Inactive Landfill Initiative. Responsibilities included management of a groundwater investigation to examine the potential presence of per- and poly fluoroalkyl substances (PFAS) contamination.
- Project support for ongoing large and complex mixed-use development of a 92-acre Site located in Syosset, New York. The site was accepted into the New York State BCP and has an extensive environmental history, including former use as a wire and conduit manufacturer (former NYS Inactive Hazardous Waste Site), former landfill (currently a Federal Superfund Site), and town DPW facility. Activities completed included compiling numerous historical environmental reports prepared for the site; interacting with NYSDEC, USEPA, NCDOH; completing a supplemental soil investigation (including extensive use of XRF Technology, as metals are the compound of concern); conducting a groundwater investigation (water is over 100 feet deep); and managing a Remedial Investigation that included a groundwater investigation to evaluate the potential presence of per- and poly fluoroalkyl substances (PFAS) contamination.
- Project Manager for the redevelopment of a strip mall in East Orange, New Jersey that contained seven former and one operating dry cleaner, three former fueling stations, and a former automotive repair shop. Project scope included completing a NJ specific Preliminary Assessment and Site Investigation, assessing indoor air and IECs, and preparing and implementing a Remedial Investigation Work Plan and Remedial Action Work Plan.
- Project Manager for the redevelopment of a 3.1-acre site in the St. George region of Staten Island, New York. The project was enrolled in the NYC OER VCP, which transferred over 20,000 CY of soil through the Clean Soil Bank and will obtain a Track 1 Cleanup. When constructed, the project will include 62,000 sq ft of retail space, 109 residential apartments, a 180-room hotel, 125,000 sq ft of subgrade parking, and four rehabilitated historic U.S. Lighthouse Depot buildings.
- Project Manager for a site in the New York State Department of Environmental Conservation (NYSDEC) Spills Program in Brooklyn, New York. Responsibilities included a remedial investigation to delineate the nature and extent of the subsurface contamination; implementing an *in situ* chemical oxidation injection program utilizing RegenOx™ oxidant compound, which was injected into 28 injection points throughout the site; and designing and managing a hot spot excavation remedial measure to remove the source area that served as a continuing source of groundwater contamination.
- Project Manager for a high-end residential redevelopment project in Mineola, New York. Responsibilities included designing and implementing an *in situ* waste characterization program, excavation support, and the closure and abandonment of 10 Class V drywell structures. The drywell abandonment

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was conducted in accordance with the USEPA Underground Injection Control Program as administered by USEPA Region 2 and the Nassau County Department of Health (NCDOH). The project involved coordination with the client, the client's on-site subcontractor, the NCDOH, and the USEPA to successfully complete the job. Ms. Henke prepared the work plan and summary report to fulfill NCDOH and USEPA's requirements in order to obtain a No Further Action Letter.

- Project Manager for the remediation of four drywell structures at a former pharmaceutical facility in Hauppauge, New York. The drywell remediation project was conducted in accordance with the Suffolk County Article XII requirements and entailed coordination with Suffolk County Department of Health Services (SCDHS). This project was unique in that the drywell sediment characterization and remediation work had to be completed within one month of receiving preliminary characterization data from SCDHS, with a threat of monetary penalty if this schedule was exceeded. The remediation and Remediation Summary Report were completed in the timeframe specified by SCDHS.
- Project Manager for the on-going site management of a redevelopment project in Corona, Queens, New York. The Site formerly operated as an automobile dealership and was accepted into the NYSDEC Brownfield Cleanup Program. A conditional Track 1 Cleanup was successfully completed at the Site in 2015, and the Site is now subject to a Site Management Plan (SMP). The final remedial design and SMP include a vapor barrier, active ventilation systems in the proposed sub-grade parking levels, and biannual groundwater monitoring to address the remaining CVOC contamination in regional groundwater.
- Project Manager and support to Expert Witness for an on-going case on behalf of a PRP (Defendant) at a former landfill in upstate New York. The site is in the state superfund program and contained waste from Love Canal. Downgradient receptors include a residential community. The case involves the evaluation of mass contribution of specific chemicals, timing of disposal, and cost allocation. Complaint Index No. E161116/2017; Supreme Court of the State of New York, Niagara County.
- Support to Expert Witness for an on-going case between a major insurance carrier and a large multi-national chemical manufacturer. Case involved categorizing past costs of 12 chemical sites across the country. Assisted in the preparation of the expert report on behalf of the insurance carrier (Defendant). Complaint No. 84 Civ. 1968 (JSR); U.S. District Court, Southern District of New York. Field Manager responsible for implementation of Remedial Investigation Work Plan (RIWP) and Waste Characterization Sampling Plan at a 2.98-acre New York State BCP site containing chlorinated solvents, heavy metals, and petroleum compounds in soil, soil vapor, and groundwater over one city block in Astoria, New York. Responsibilities include soil and soil vapor sampling in addition to groundwater sampling for emerging contaminants (1,4-dioxane and PFAS).
- Field Manager for a site in the New York State Brownfields Cleanup Program (BCP) that also required a RCRA compliant facility closure. The site is a former paint factory located in Long Island City, New York. Due diligence environmental investigations determined historical site operations adversely impacted the subsurface, including a LNAPL plume in addition to petroleum hydrocarbon impacts to the soil and groundwater. Responsibilities included: 1) oversight of RCRA closure activities at the site that included emptying, cleaning, and scrapping 65 ASTs/vessels, decontaminating approximately 30,000 square feet of hazardous waste storage areas within the Paint Factory Building and collecting compliance samples, and 2) oversight of implementation of the RAWP, which included a large excavation requiring SOE and completion under a tent due to odor concerns, multiple ISCO injections, removal/abandonment of USTs with a total capacity of over 200,000 gallons, and installation of a LNAPL recovery system.
- Sampling team leader tasked with the rapid assessment of soils outside 40 residential and sensitive-use properties located near the former battery recycling facility in Vernon, California. Lead emissions from the former facility are suspected of affecting surface and near-surface soils in surrounding areas as a result of aerial deposition. Responsibilities included conducting soil sample screening on each property at up to 15 locations on lawn areas, bare soils, garden areas, play areas, and roof drip-zones using an X-ray fluorescence (XRF) analyzer to submit the two largest sampling areas for confirmatory laboratory analysis.
- Field manager in charge of Pre-Design Investigation and Waste Characterization sampling event for a New York State BCP project in Brooklyn, New York. The site is an auto dealership with petroleum and chlorinated solvent contamination in soil and groundwater.
- Field Manager for aquifer tests completed at a closed landfill in Holtsville, New York. Field tasks included monitoring groundwater levels with a network of *In Situ* LevelTrolls during a step-drawdown test and during a constant-rate pump test. Aquifer test data were subsequently used to determine hydrogeologic parameters of the aquifer beneath the Site using AQTESOLV software and various methods of analyses.
- Field Manager for a site in the NYCOER VCP. The site is a former gas station located in Manhattan, New York. Historical site operations adversely affected the subsurface through petroleum hydrocarbon impacts. Responsibilities included implementing a Community Air Monitoring Program (CAMP); managing soils including transportation and disposal; collecting soil

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samples; and maintaining communication between subcontractors and Roux office support.

- Performed numerous Phase I Environmental Site Assessments for due diligence in connection with property transfers for the New York Metropolitan Area.
- Remedial construction manager responsible for soil excavation and waste removal oversight for development in Staten Island, New York. Responsibilities include oversight excavation, organization, and proper handling of waste manifests; performing Stormwater Pollution Prevention Plan (SWPPP) inspections; ensuring compliance with the Site Management Plan; health and safety oversight; and reporting NYCDEP and NYSDEC inspections to the client.
- Field Manager responsible for the implementation of a CAMP during excavation and disposal activities at multiple locations in Manhattan and Queens, New York. Ms. Henke monitored airborne dust and VOCs that were potentially generated by remedial action work activities and reviewed the collected data for exceedances of the New York State Department of Health (NYSDOH) guidelines.
- Site Safety Officer for various remedial investigation sites. Responsibilities include preparation of health and safety plans (HASPs), job safety analysis (JSA) documents development and review, on-site safety meeting management, safety document preparation (Lessons Learned, Near Loss, Field Audits, etc.), and planning/executing corrective actions.
- Assisted in the implementation of a large-scale waste characterization program and remedial investigation for a major redevelopment project in Flushing, New York that is enrolled in NYCOER VCP and E-designation programs. The project included the coordination and oversight of an *in situ* waste characterization sampling of over 450,000 tons of soil and delineating a NYSDEC spill site within the project footprint.
- Assisted in bi-annual soil vapor monitoring round to surveil the largest subsurface free-product plume in North America at a former fuel and oil distribution terminal in Brooklyn, New York. Activities included the collection of soil vapor and ambient air samples from on-site and off-site monitoring wells using EPA method TO-15.

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ROUX

PROFESSIONAL PROFILE

Josh Cope
Senior Scientist

TECHNICAL SPECIALTIES
Fuel oil forensics and age dating, USEPA Superfund, OPA, and NJDEP environmental regulations, Site Assessment and Contractor Oversight, GC/MS Operator, Data Validation, Technical Report preparation and review, Field Chemistry: field screening, HAZCATTING, groundwater and soil sampling, Hazardous Waste Transportation and Disposal

EXPERIENCE SUMMARY
Over 27 years of experience; Senior Scientist with Roux Associates, Inc.; Senior Chemist, Project Manager with Tetra Tech, Inc.; Owner of Geodyne Engineering Consultants, Inc.; Quality Assurance Officer, GC/MS Operator, Twenty First Century Environmental, Inc.; Project Manager, Field Technician, Resource Applications, Inc.

CREDENTIALS
B.A., 1991, Chemistry, Haverford College
OSHA 40-Hour Health and Safety Training
New Jersey Transit (NJT) – Roadway Worker / On Track Protection

FEDERAL PROGRAMS – CLIENT: USEPA
KEY PROJECTS
- Provide technical and project management support to USEPA Removal and Remedial Branches in Regions 2, 3, 4 on Superfund and OPA projects.
- Manage and perform phase I and II site assessments, remedial investigations, removal action oversight, prepare health and safety plans, monitor site health and safety, support USEPA enforcement actions, implementation of Facility Response Plan (FRP) program, emergency response, biowatch exercises, criminal investigation support, contractor oversight, cost tracking, documentation, daily reporting, prepare after action reports, data validation, waste management, and attend public meetings
- Sites include: UST, AST, and pipeline leaks, lead smelter sites, wood treatment facilities, coal to gas plants, dry cleaners, junk yards, federal facilities, unpermitted landfills, drum burial, flood and hurricane clean up, oil refinery inspections, farmland, and historic industrial sites.
- Contaminants include: TCE, PCE, MTBE, BTEX, oil, gasoline, PCP, PAHs, mercury, lead, arsenic, ammonia, acids, bases, pesticides, PCBs, asbestos, and unknowns.
- Participated in the largest USEPA sponsored interagency response emergency response exercise, Liberty Radex, in Philadelphia. Acted as planner prior to the exercise and master controller during the exercise.
- Interface with state and local regulators on sites in Pennsylvania, Delaware, New Jersey, Maryland, Virginia, West Virginia, and Mississippi.

STATE PROGRAMS – CLIENTS: BUSINESSES AND INDIVIDUALS IN NEW JERSEY
- Provide a wide array of environmental services to homeowners, land developers, insurance companies, gas stations, and small industrial companies in New Jersey.
- Manage and/or perform ISRA reporting, phase I and II site assessments, third party investigations, subsurface evaluation, UST removal, air emissions permitting preparation, soil, groundwater, and vapor intrusion investigations, NPDES compliance.
- Manage remedial investigation, design, and execution for LUSTs, and farmland development.
- Manage reporting, deed restriction preparation, CEAs, remedial action permits, and response action outcome preparation (RAO).
- Evaluate environmental costs for insurance claims and litigation cases.
- Prepare and present justification for fine reduction to state regulators for private client.
- Meet with clients, prepare proposals, and negotiate contracts.

DATA VALIDATION/LABORATORY EXPERIENCE
- Perform level 3 and 4 data validation of analytical data packages in accordance with USEPA National Functional Guidelines.
- Data validation in accordance with NJDEP DKQP and NYS DUSR guidance.
- Quality assurance officer and GC/MS operator for New Jersey certified laboratory.
- Performed analysis of volatile and semi-volatile organics.
- Preformed maintenance and repair of analytical instruments.
- Performed method development and troubleshooting of analytical issues.
- Set up and operated mobile laboratory for organic and inorganic analyses on Superfund site assessments.
- Performed field screening of contaminants using test kits, XRF, radiation meters, and various types of air monitoring equipment.

WASTE MANAGEMENT
- Waste Management Specialist for oil pipeline client in Michigan for largest inland oil spill in United States during August 2010 through October 2011.
- Responsible for compliance, cost tracking, cost estimation, waste tracking and reporting, oil recovery calculation and reporting, contractor oversight.

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Josh Cope
Senior Scientist

- Prepared Waste Transportation and Disposal Plans and responses to regulator comments.
- Prepared waste profiles, negotiated waste removal protocols with USEPA and MDEQ to streamline process of waste handling to realize savings through greater efficiency and lowering sampling requirements.
- Located disposal facilities, negotiated disposal rates.
- Performed cost benefit analysis of various soil dewatering agents and procedures and proposed methods and protocols to client, USEPA, and MDEQ.
- Performed some oversight of removal actions along river.
- Supported submerged oil assessment of river.

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ROUX

PROFESSIONAL PROFILE

Jeffrey Wills
Senior Hydrogeologist

TECHNICAL SPECIALTIES

Design, implementation, and management of remedial investigations and Phase II Environmental Site Assessments including New York State Brownfields Cleanup Program; New York State Inactive Hazardous Wastes Site Program; New York State Spills; and New York City Office of Environmental Remediation Voluntary Cleanup Program.

EXPERIENCE SUMMARY

Fourteen years of experience: Staff Assistant Scientist, Staff Geologist, Project Hydrogeologist and Senior Hydrogeologist with Roux Environmental Engineering and Geology, D.P.C., Islandia, New York.

CREDENTIALS

B.S., Environmental Resources/ Geology, Hofstra University, 2006

Co-author, *Post-Allegheanian Deformation of the Shawangunk Ridge in New York and New Jersey*, 2005

OSHA 40-Hour HAZWOPER Training: 2006

OSHA 8-Hour Refresher: 2019

OSHA 10-Hour Training: 2018

Loss Prevention Systems Training Certification: 2008

Loss Prevention Systems Training Refresher: 2014

Amtrak Contractor Training: 2020

NYS Licensed Professional Geologist license: #000999

KEY PROJECTS

- Senior Project Manager for a site in the New York State Brownfields Cleanup Program. The site was formally used for the manufacturing and storage of disinfectants, soaps and pesticides located in Long Island City, New York. This project included due diligence environmental investigations (onsite and offsite) that identified a large creosote plume beneath portions of the site as well as 45 subsurface vaults/kettles, which contained chemicals used for the manufacturing of disinfectants, soaps and pesticides as well as in situ waste characterization sampling program and a Remedial Action Work Plan, which included the removal of the 45 subsurface vaults/kettles contents and structures, excavation of soils below grade and soil management, design, installation and operation of a recovery well and an in situ chemical oxidation (ISCO) program utilizing alkaline-activated Persulfate.
- Senior Project Manager for a site in the New York State Brownfields Cleanup Program that was an Affordable Housing redevelopment project in Bronx, New York. The site was formally used as a juvenile detention center. This project included due diligence environmental investigations, remedial investigations (soil, groundwater and soil vapor), demolition oversight, site-wide *in situ* waste characterization sampling program, Community Air Monitoring Program and a Remedial Action Work Plan and management of soil excavations with NYSDEC oversight.
- Senior Project Manager for a former dry cleaner site within a fully occupied center, in Plainview, New York. This project included a remedial investigation to identify source(s) of impacted soil, groundwater, soil vapor and indoor air as well as the preparation of Remedial Investigation/Feasibility Study Report, Interim Remedial Measure Work Plan and Remedial Action Work Plan.
- Senior Project Manager for a 13 acre Brownfield redevelopment site in Norwalk, Connecticut. The site was formally used for multiple gasoline service stations, automotive repair shops and a waste hauler and storage. This project included due diligence environmental investigations, site-wide *in situ* waste characterization sampling program and a Remedial Action Plan and management of soil excavations, including lead and PCB contaminated soil.
- Senior Project Manager for the investigation and remediation of chlorinated volatile organic compounds (CVOCs) at a former dry cleaner within an active shopping center in Enfield, Connecticut. This project included the completion of soil, groundwater, soil vapor and indoor air sampling activities as well as groundwater monitoring and injection well installations. Remedial action activities included the completion of two ISCO injection events in occupied spaces at the site. Responsibilities included: site management, oversight for all field work, budgeting, scheduled and coordinated with subcontractors, post-injection groundwater monitoring, review and evaluation of laboratory data and reporting.
- Senior Project Manager for multiple projects to support remediation activities at the Amtrak Sunnyside Yard State Superfund Site in Long Island City, New York. Responsibilities included characterization of subsurface conditions, including PCB and cPAH soil and groundwater contamination. Mr. Wills was responsible for overseeing the implementation of remediation activities, including soil excavation and offsite disposal, and surfactant injections.
- Senior Project Manager for an 11 acre redevelopment site in the New York State Volunteer Cleanup Program. The site was formally a Steel Factory located in Manorhaven, New York. Completed multiple soil and groundwater investigations as well as utilized Membrane Interface Probe (MIP) technology and Cone Penetration Test (CPT) to delineate both the extent of contamination plume and subsurface geology; Responsibilities included MIP/CPT oversight, monitoring well installation, collection of soil and groundwater samples and construction of geological cross-sections; Supervised a challenging four phase ISCO injection program that utilized RegenOx™ oxidant compound, which was injected into over 120

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Jeffrey Wills
Senior Hydrogeologist

injection points throughout the site; Responsibilities included: Site management, budgeting, implementation of a pressure pulse technology (Sidewinder tool) pilot study, scheduled and coordinated with subcontractors, post-injection groundwater monitoring, USEPA and NYSDEC compliance, review and evaluation of laboratory data and reporting.

- Manager for a 40,000 square foot facility in the New York State Brownfields Cleanup Program located in Williamsburg, Brooklyn. The site was formally a storage and distributer of dry cleaner chemicals. Remedial investigation work included the collection of soil, groundwater and soil vapor samples as well as the installation of multiple groundwater monitoring wells. Responsibilities included the oversight of all field work, site management, scheduling and coordination with Subcontractors, invoicing and compliance with NYSDEC regulations.
- Manager for a site in the New York State Brownfields Cleanup Program. The site was formally a used car dealership in Corona, Queens, New York. This project included an ISCO program utilizing RegenOx™ oxidant compound, which was injected into 40 injection points throughout the site. Responsibilities included: Site management; budgeting; scheduling, coordination, and negotiations with subcontractors; post-injection groundwater monitoring, and USEPA and NYSDEC compliance, review and evaluation of laboratory data and reporting.
- Manager for Phase II Remedial Investigations associated with petroleum contamination for a very large and long term project at a waterfront former petroleum refinery and terminal in Brooklyn, New York. The field investigations included the completion of cone penetrometer test (CPT) and laser induced fluorescence (LIF) soil borings, a membrane interface probe (MIP) investigation, installation and development of over 50 groundwater monitoring wells, installation of 30 permanent soil vapor monitoring points, completion of trial borings, design/installation of product recovery wells, abandonment of multiple groundwater monitoring and product recovery wells, and delineation of PCB impacted soil with NYSDEC oversight.
- Manager responsible for the investigations and remediations at various mixed development sites containing hazardous and non-hazardous soils in New York City. These projects included the implementation of Remedial Investigation Work Plans, in situ waste characterization sampling program and a Remedial Action Work Plans, which included excavation of soils below grade and management of soils including transportation and disposal, and coordination with various disposal facilities. Some of these sites were accepted into the New York City Office of Environmental Remediation and Brownfield Cleanup Program.
- Manager at 100+ facilities owned and/or operated by various city agencies in New York City, Brooklyn, Queens and Staten Island. Responsibilities included supervising and conducting soil, groundwater and soil vapor sampling work under NYSDEC-approved work plans. Responsible for the preparation of quarterly/ semiannual monitoring reports and construction of groundwater contour maps and geologic cross-sections for submittal to NYSDEC. Evaluation of field data and preparation of soil boring and well construction logs using gINT© software. Assisted in scheduling and coordinating with subcontractors (drillers, surveyors, enhanced fluid recovery [EFR] events) as well as review subcontractors work invoices. Provided oversight during the installation of several monitoring wells at multiple Sites throughout Brooklyn, Queens, and Staten Island, New York. Responsibilities included health and safety supervision for utility clearances, soil sampling, recording of lithology, well development, and groundwater sampling.
- Manager for the investigation and remediation of chlorinated volatile organic compounds (CVOCs) at an active shopping center in Parsippany, New Jersey. Field activities included the completion of soil and groundwater sampling activities as well as groundwater monitoring well installations and abandonments. Remedial action activities included the injection of zero valent iron and emulsified vegetable oil (ZVI/EVO) at 28 temporary injection borings throughout the impacted portion of the site. Responsibilities included: site management, oversight for all field work; budgeting, scheduled and coordinated with subcontractors, post-injection groundwater monitoring, compliance with NJDEP regulations, review and evaluation of laboratory data and reporting.
- Manager of an annual soil vapor monitoring program for a former petroleum refinery and terminal in Brooklyn, New York. Field work included the sampling and screening of 100 permanent soil vapor monitoring points and the screening of indoor air within multiple buildings for soil vapor intrusion monitoring.
- Manager for multiple soil investigations at Department of Sanitation (DOS) garages in Staten Island, New York; Responsibilities included negotiating the scope of work with the DOS Supervisor, scheduling of work and collection of soil and groundwater samples; Supervised surveying of monitoring wells and geophysical surveying using ground penetrating radar to locate petroleum underground storage tanks and piping.

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APPENDIX B

Standard Operating Procedures, Laboratory Detection Limits for Emerging Contaminants and NYSDEC Guidance for Sampling Emerging Contaminants

Date: May 5, 2000

1.0 PURPOSE

The purpose for this standard operating procedure (SOP) is to establish the guidelines for decontamination of all field equipment potentially exposed to contamination during drilling, and soil and water sampling. The objective of decontamination is to ensure that all drilling, and soil-sampling and water-sampling equipment is decontaminated (free of potential contaminants): 1) prior to being brought onsite to avoid the introduction of potential contaminants to the site; 2) between drilling and sampling events/activities onsite to eliminate the potential for cross-contamination between boreholes and/or wells; and 3) prior to the removal of equipment from the site to prevent the transportation of potentially contaminated equipment offsite.

In considering decontamination procedures, state and federal regulatory agency requirements must be considered because of potential variability between state and federal requirements and because of variability in the requirements of individual states. Decontamination procedures must be in compliance with state and/or federal protocols in order that regulatory agency(ies) scrutiny of the procedures and data collected do not result in non-acceptance (invalidation) of the work undertaken and data collected.

2.0 PROCEDURE FOR DRILLING EQUIPMENT

The following is a minimum decontamination procedure for drilling equipment. Drilling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

2.1 The rig and all associated equipment should be properly decontaminated by the contractor before arriving at the test site.

2.2 The augers, drilling casings, rods, samplers, tools, rig, and any piece of equipment that can come in contact (directly or indirectly) with the soil, will be steam cleaned onsite prior to set up for drilling to ensure proper decontamination.

2.3 The same steam cleaning procedures will be followed between boreholes (at a fixed on-site location[s], if appropriate) and before leaving the site at the end of the study.

2.4 All on-site steam cleaning (decontamination) activities will be monitored and documented by a member(s) of the staff of Roux Associates, Inc.

2.5 If drilling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat drilling equipment, then special decontamination procedures may have to be utilized before steam cleaning (e.g., hexane scrub and wash).

2.6 Containment of decontamination fluids may be necessary (e.g., rinseate from steam cleaning) or will be required (e.g., hexane), and disposal must be in accordance with state and/or federal procedures.

3.0 PROCEDURE FOR SOIL-SAMPLING EQUIPMENT

The following is a minimum decontamination procedure for soil-sampling equipment (e.g., split spoons, stainless-steel spatulas). Soil-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

3.1 Wear disposable gloves while cleaning equipment to avoid cross-contamination and change gloves as needed.

3.2 Steam clean the sampler or rinse with potable water. If soil-sampling activities are conducted in the presence of thick, sticky oils (e.g., PCBs) which coat sampling equipment, then special decontamination procedures may have to be utilized before steam cleaning and washing in detergent solution (e.g., hexane scrub and wash).

3.3 Prepare a non-phosphate, laboratory-grade detergent solution and distilled or potable water in a clean bucket.

3.4 Disassemble the sampler, as necessary and immerse all parts and other sampling equipment in the solution.

3.5 Scrub all equipment in the bucket with a brush to remove any adhering particles.

3.6 Rinse all equipment with copious amounts of potable water followed by distilled or deionized water.

3.7 Place clean equipment on a clean plastic sheet (e.g., polyethylene)

3.8 Reassemble the cleaned sampler, as necessary.

3.9 Transfer the sampler to the driller (or helper) making sure that this individual is also wearing clean gloves or wrap the equipment with a suitable material (e.g., plastic bag, aluminum foil.

As part of the decontamination procedure for soil-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

4.0 PROCEDURE FOR WATER-SAMPLING EQUIPMENT

The following is a decontamination procedure for water-sampling equipment (e.g., bailers, pumps). Water-sampling equipment decontamination procedures, especially any variation from the method itemized below, will be documented on an appropriate field form or in the field notebook.

4.1 Decontamination procedures for bailers follow:

a. Wear disposable gloves while cleaning bailer to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a bucket.

c. Disassemble bailer (if applicable) and discard cord in an appropriate manner and scrub each part of the bailer with a brush and solution.

d. Rinse with potable water and reassemble bailer.

e. Rinse with copious amounts of distilled or deionized water.

f. Air dry.

g. Wrap equipment with a suitable material (e.g., clean plastic bag, aluminum foil).

h. Rinse bailer at least three times with distilled or deionized water before use.

4.2 Decontamination procedures for pumps follow:

a. Wear disposable gloves while cleaning pump to avoid cross-contamination and change gloves as needed.

b. Prepare a non-phosphate, laboratory-grade detergent solution and potable water in a clean bucket, clean garbage can, or clean 55-gallon drum.

c. Flush the pump and discharge hose (if not disposable) with the detergent solution and discard disposable tubing and/or cord in an appropriate manner.

d. Flush the pump and discharge hose (if not disposable) with potable water.

e. Place the pump on clear plastic sheeting.

f. Wipe any pump-related equipment (e.g., electrical lines, cables, discharge hose) that entered the well with a clean cloth and detergent solution, and rinse or wipe with a clean cloth and potable water.

g. Air dry.

h. Wrap equipment with a suitable material (e.g., clean plastic bag).

As part of the decontamination procedure for water-sampling equipment, state and/or federal protocols must be considered. These may require procedures above those specified as minimum for Roux Associates, Inc., such as the use of nitric acid, acetone, etc. Furthermore, the containment and proper disposal of decontamination fluids must be considered with respect to regulatory agency(ies) requirements.

Date: May 5, 2000

1.0 PURPOSE

The purpose of this standard operating procedure (SOP) is to establish guidelines for sample handling which will allow consistent and accurate results. Valid chemistry data are integral to investigations that characterize media-quality conditions. Thus, this SOP is designed to ensure that once samples are collected, they are preserved, packed and delivered in a manner which will maintain sample integrity to as great an extent as possible. The procedures outlined are applicable to most sampling events and any required modifications must be clearly described in the work plan.

2.0 CONSIDERATIONS

Sample containers, sampling equipment decontamination, quality assurance/quality control (QA/QC), sample preservation, and sample handling are all components of this SOP.

2.1 Sample Containers

Prior to collection of a sample, considerations must be given to the type of container that will be used to store and transport the sample. The type and number of containers selected is usually based on factors such as sample matrix, potential contaminants to be encountered, analytical methods requested, and the laboratory's internal quality assurance requirements. In most cases, the overriding considerations will be the analytical methodology, or the state or federal regulatory requirements because these regulations generally encompass the other factors. The sample container selected is usually based on some combination of the following criteria:

a. Reactivity of Container Material with Sample

Choosing the proper composition of sample containers will help to ensure that the chemical and physical integrity of the sample is maintained. For sampling potentially hazardous material, glass is the recommended container type because it is chemically inert to most substances. Plastic containers are not recommended for most hazardous wastes because the potential exists for contaminants to adsorb to the surface of the plastic or for the plasticizer to leach into the sample.

In some instances, however, the sample characteristics or analytes of interest may dictate that plastic containers be used instead of glass. Because some metals species will adhere to the sides of the glass containers in an aqueous matrix, plastic bottles (e.g., nalgene) must be used for samples collected for metals analysis. A separate, plastic

container should accompany glass containers if metals analysis is to be performed along with other analyses. Likewise, other sample characteristics may dictate that glass cannot be used. For example, in the case of a strong alkali waste or hydrofluoric solution, plastic containers may be more suitable because glass containers may be etched by these compounds and create adsorptive sites on the container's surface.

b. Volume of the Container

The volume of sample to be collected will be dictated by the analysis being performed and the sample matrix. The laboratory must supply bottles of sufficient volume to perform the required analysis. In most cases, the methodology dictates the volume of sample material required to complete the analysis. However, individual laboratories may provide larger volume containers for various analytes to ensure sufficient quantities for duplicates or other QC checks.

To facilitate transfer of the sample from the sampler into the container and to minimize spillage and sample disturbance, wide-mouth containers are recommended. Aqueous volatile organic samples must be placed into 40-milliliter (ml) glass vials with polytetrafluoroethylene (PTFE) (e.g., TeflonTM) septums. Non-aqueous volatile organic samples should be collected in the same type of vials or in 4-ounce (oz) wide-mouth jars provided by the laboratory. These jars should have PTFE-lined screw caps.

c. Color of Container

Whenever possible, amber glass containers should be used to prevent photodegradation of the sample, except when samples are being collected for metals analysis. If amber containers are not available, then containers holding samples should be protected from light (i.e., place in cooler with ice immediately after filling).

d. Container Closures

Container closures must screw on and off the containers and form a leak-proof seal. Container caps must not be removed until the container is ready to be filled with the sample, and the container cap must be replaced (securely) immediately after filling it. Closures should be constructed of a material which is inert with respect to the sampled material, such as PTFE (e.g., TeflonTM). Alternately, the closure may be separated from the sample by a closure liner that is inert to the sample material such as PTFE sheeting. If soil or sediment samples are being collected, the threads of the container must be wiped clean with a dedicated paper towel or cloth, so the cap can be threaded properly.

e. Decontamination of Sample Containers

Sample containers must be laboratory cleaned by the laboratory performing the analysis. The cleaning procedure is dictated by the specific analysis to be performed on the sample. Sample containers must be carefully examined to ensure that all containers appear clean. Do not mistake the preservative as unwanted residue. The bottles should not be field cleaned. If there is any question regarding the integrity of the bottle, then the laboratory must be contacted immediately and the bottle(s) replaced.

f. Sample Bottle Storage and Transport

No matter where the sample bottles are, whether at the laboratory waiting to be packed for shipment or in the field waiting to be filled with sample, care must be taken to avoid contamination. Sample shuttles or coolers, and sample bottles must be stored and transported in clean environments. Sample bottles and clean sampling equipment must never be stored near solvents, gasoline, or other equipment that is a potential source of cross-contamination. When under chain of custody, sample bottles must be secured in locked vehicles, and custody sealed in shuttles or in the presence of authorized personnel. Information which documents that proper storage and transport procedures have been followed must be included in the field notebook and on appropriate field forms.

2.2 Decontamination of Sampling Equipment

Proper decontamination of all re-usable sampling equipment is critical for all sampling episodes. The SOP for Decontamination of Field Equipment and SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for decontamination of various types of equipment.

2.3 Quality Assurance/Quality Control Samples

QA/QC samples are intended to provide control over the proper collection and tracking of environmental measurements, and subsequent review, interpretation and validation of generated analytical data. The SOPs for Collection of Quality Control Samples, for Evaluation and Validation of Data, and for Field Record Keeping and Quality Assurance/Quality Control must be referred to for detailed guidance regarding these respective procedures. SOPs for method-specific or instrument-specific tasks must also be referred to for guidance for QA/QC procedures.

2.4 Sample Preservation Requirements

Certain analytical methodologies for specific analytes require chemical additives in order to stabilize and maintain sample integrity. Generally, this is accomplished under the following two scenarios:

a. Sample bottles are preserved at the laboratory prior to shipment into the field.

b. Preservatives are added in the field immediately after the samples are collected.

Many laboratories provide pre-preserved bottles as a matter of convenience and to help ensure that samples will be preserved immediately upon collection. A problem associated with this method arises if not enough sample could be collected, resulting in too much preservative in the sample. More commonly encountered problems with this method include the possibility of insufficient preservative provided to achieve the desired pH level or the need for additional preservation due to chemical reactions caused by the addition of sample liquids to pre-preserved bottles. The use of pre-preserved bottles is acceptable; however, field sampling teams must always be prepared to add additional preservatives to samples if the aforementioned situations occur. Furthermore, care must be exercised not to overfill sample bottles containing preservatives to prevent the sample and preservative from spilling and therefore diluting the preservative (i.e., not having enough preservative for the volume of sample).

When samples are preserved after collection, special care must be taken. The transportation and handling of concentrated acids in the field requires additional preparation and adherence to appropriate preservation procedures. All preservation acids used in the field should be trace-metal or higher-grade.

2.5 Sample Handling

After the proper sample bottles have been received under chain-of-custody, properly decontaminated equipment has been used to collect the sample, and appropriate preservatives have been added to maintain sample integrity, the final step for the field personnel is checking the sample bottles prior to proper packing and delivery of the samples to the laboratory.

All samples should be organized and the labels checked for accuracy. The caps should be checked for tightness and any 40-ml volatile organic compound (VOC) bottles must be checked for bubbles. Each sample bottle must be placed in an individual Ziploc® bag to protect the label, and placed on ice. The bottles must be carefully packed to prevent breakage during transport. When several bottles have been collected for an individual sample, they should not be placed adjacent to each other in the cooler to prevent possible breakage of all bottles for a given sample. If there are any samples which are known or suspected to be highly

contaminated, these should be placed in an individual cooler under separate chain-of-custody to prevent possible cross contamination. Sufficient ice (wet or blue packs) should be placed in the cooler to maintain the temperature at 4 degrees Celsius (°C) until delivery at the laboratory. Consult the work plan to determine if a particular ice is specified as the preservation for transportation (e.g., the United States Environmental Protection Agency does not like the use of blue packs because they claim that the samples will not hold at 4°C). If additional coolers are required, then they should be purchased. The chain-of-custody form should be properly completed, placed in a "zip-lock" bag, and placed in the cooler. One copy must be maintained for the project files. The cooler should be sealed with packing tape and a custody seal. The custody seal number should be noted in the field book. Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time. If overnight mail is utilized, then the shipping bill must be maintained for the files and the laboratory must be called the following day to confirm receipt.

3.0 EQUIPMENT AND MATERIALS

3.1 General equipment and materials may include, but not necessarily be limited to, the following:

a. Sample bottles of proper size and type with labels.

b. Cooler with ice (wet or blue pack).

c. Field notebook, appropriate field form(s), chain-of-custody form(s), custody seals.

d. Black pen and indelible marker.

e. Packing tape, "bubble wrap," and "zip-lock" bags.

f. Overnight (express) mail forms and laboratory address.

g. Health and safety plan (HASP).

h. Work plan/scope of work.

i. Pertinent SOPs for specified tasks and their respective equipment and materials.

3.2 Preservatives for specific samples/analytes as specified by the laboratory. Preservatives must be stored in secure, spillproof glass containers with their content, concentration, and date of preparation and expiration clearly labeled.

3.3 Miscellaneous equipment and materials including, but not necessarily limited to, the following:

a. Graduated pipettes.

b. Pipette bulbs.

c. Litmus paper.

d. Glass stirring rods.

e. Protective goggles.

f. Disposable gloves.

g. Lab apron.

h. First aid kit.

i. Portable eye wash station.

j. Water supply for immediate flushing of spillage, if appropriate.

k. Shovel and container for immediate containerization of spillage-impacted soils, if appropriate.

4.0 PROCEDURE

4.1 Examine all bottles and verify that they are clean and of the proper type, number, and volume for the sampling to be conducted.

4.2 Label bottles carefully and clearly with project name and number, site location, sample identification, date, time, and the sampler's initials using an indelible marker.

4.3 Collect samples in the proper manner (refer to specific sampling SOPs).

4.4 Conduct preservation activities as required after each sample has been collected. Field preservation must be done immediately and must not be done later than 30 minutes after sample collection.

4.5 Conduct QC sampling, as required.

4.6 Seal each container carefully and place in an individual "zip lock" bag.

4.7 Organize and carefully pack all samples in the cooler immediately after collection (e.g., bubble wrap). Insulate samples so that breakage will not occur.

4.8 Complete and place the chain-of-custody form in the cooler after all samples have been collected. Maintain one copy for the project file. If the cooler is to be transferred several times prior to shipment or delivery to the laboratory, it may be easier to tape the chain-of-custody to the exterior of the sealed cooler. When exceptionally hazardous samples are known or suspected to be present, this should be identified on the chain-of-custody as a courtesy to the laboratory personnel.

4.9 Add additional ice as necessary to ensure that it will last until receipt by the laboratory.

4.10 Seal the cooler with packing tape and a custody seal. Record the number of the custody seal in the field notebook and on the field form. If there are any exceptionally hazardous samples, then shipping regulations should be examined to ensure the sample containers and coolers are in compliance and properly labeled.

4.11 Samples collected from Monday through Friday will be delivered to the laboratory within 24 hours of collection. If Saturday delivery is not available, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if certain analytes require a shorter delivery time.

4.12 Maintain the shipping bill for the project files if overnight mail is utilized and call the laboratory the following day to confirm receipt.

END OF PROCEDURE

APPENDIX G

Site Management Forms

SSDS Operations, Maintenance, Monitoring, and Sampling Tracking Sheet					
Date	**Name / Company Completing Work**	**Associated Suction Pit/ Blower Unit**	**Photos or Sketches included with Event (Yes or No)**	**List of other Documents/ Forms / Receipts included with the Work**	**Summary of Activites/Maintenance/Adjustments**

SUB-SLAB DEPRESSURIZATION SYSTEM OPERATIONS AND MAINTENANCE FORM

Site Name:	11-20 46th Road	Inspection Date:	
Street Address:	11-20 46th Road		
Location:	Long Island City, New York	Inspection Personnel:	
System:	Active Sub-Slab Depressurization System		
Blower:	Rotron EN505, 2.0 HP		
Blower Range:	75 IWG pressure, 70 IWG vacuum, 150 SCFM		

INSPECTION ITEM DESCRIPTION	Yes	No	Comments/ Actions Taken (list actions taken if "No" is checked)
Is the system operating normally?	___	___	_____
Are any warning lights on? (Please list those that are on)	___	___	_____
If there is an alarm condition, was it fixed and the system restarted?	___	___	_____
Is the blower enclosure in good condition?	___	___	_____
Are the valves (at blower and aboveground piping) in good condition?	___	___	_____
Is the vacuum filter in good condition?	___	___	_____
Does the knock-out tank need to be drained? (Record amount drained)	___	___	_____
Are vacuum/pressure gauges at blower operating properly?	___	___	_____
Is exterior piping free of cracks, leaks, and support issues?	___	___	_____
Is interior piping free of cracks, leaks, and support issues?	___	___	_____

List maintenance activities that were performed or other comments about the system: _____

Blower Influent	Vacuum (in. w.c.)	Comments
INF-1 (after knock-out tank)		
Knock-out Tank		
Blower Effluent	**Pressure (in. w.c.)**	**Comments**
EFF-1		
Soil Vapor Monitoring Point*	**Vacuum (in. w.c.)**	**Comments**
SS-7		
SS-8		
SS-9		
SS-10		
SS-11		
SS-12		
SS-16		
SS-17		
SS-18		
SS-19		
SS-20		
SS-21		

BUILDING CELLAR INSPECTION	Comments / Actions Taken
Describe General Condition of Slab	_____
Describe any Cracks or New Penetrations	_____
Describe any Patching	_____

in. w.c. - inches of water

* Refer to figure for locations of Soil Vapor Monitoring Points and Suction Points

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.

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

Site Inspection Checklist, 11-20 46th Road Site, Long Island City, Queens, NY (BCP Site No. C241242)

Date: _____

Completed By: _____

			Status			
Description			**Ok**	**Action Req.**	**N/A**	**Actions Taken / Comments**
Site Cover System						
	1	Inspect site cover system for cracks and leaks.				
Institutional Controls						
	1	Confirm that the site usage is in compliance with the institutional controls.				
Site Records						
	1	Inspect site records and confirm that they are up to date (e.g., Site Inspection Checklists, sampling logs, etc.)				
	2	Inspect integrity of Cover System				

APPENDIX H

Equipment and Device Operations and Maintenance Manuals

Gasho
SINCE 1982
The Leader in Blower & Vacuum Solutions

Submittal Documentation

For:
SD ASSET MGT
10 East 34th Street Mezzanine
New York, NY 10016

PO# Signed Contract

Equipment Description: Ametek Model EN505, 2HP TEFC Motor, 1.5" Dilution Valve, Moisture Separator, Enclosure, Control Panel

REV A 7/7/20

Supplier:
Gasho, Inc.
460 West Gay Street
West Chester, PA 19380

JG20F-3455

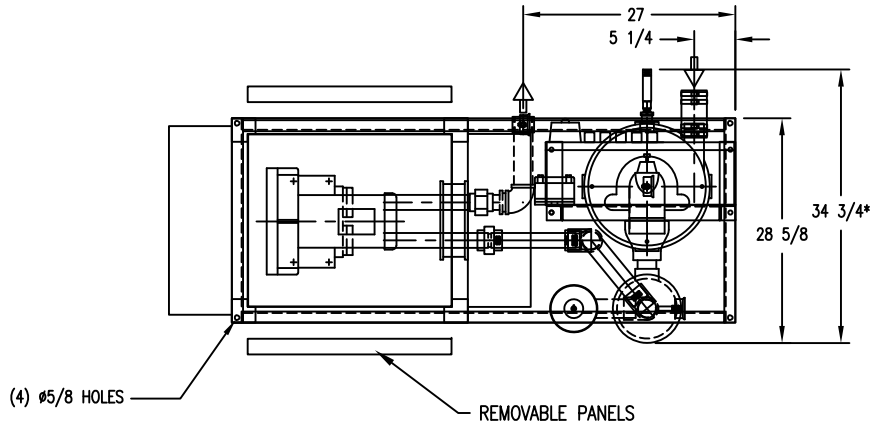
Gasho, Inc.

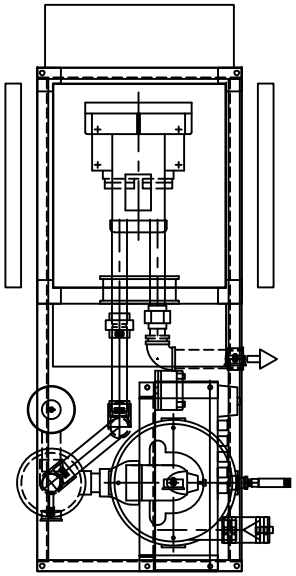
JG20F-3455

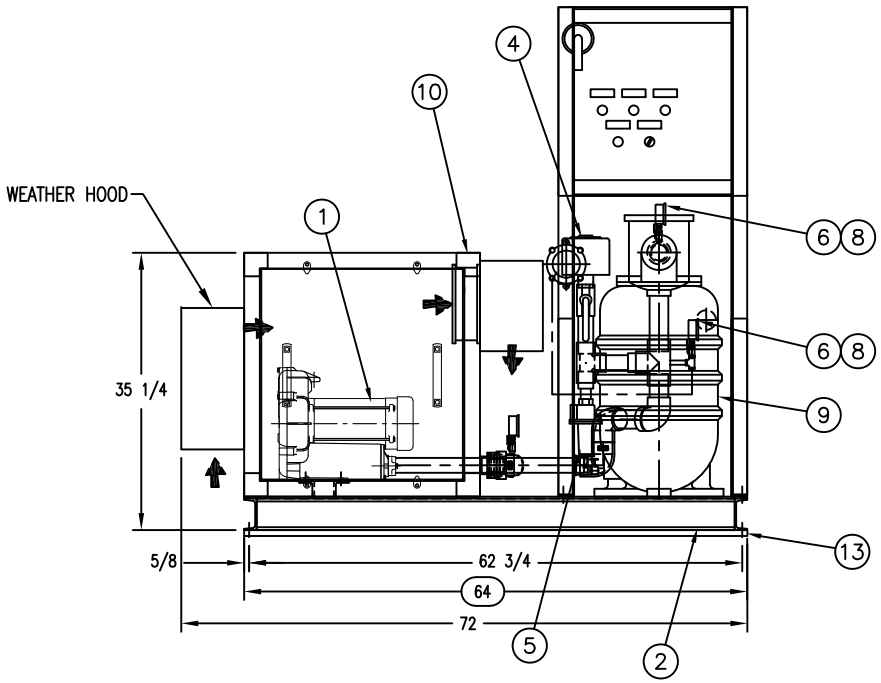
BLOWER PACKAGE

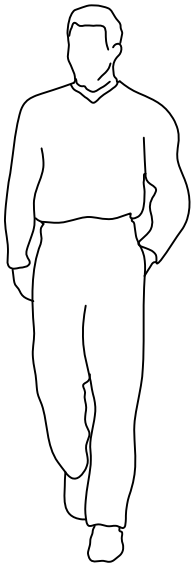
Description	Date	Revision
Item 10 was Dyer encl.	6/30/2020	A

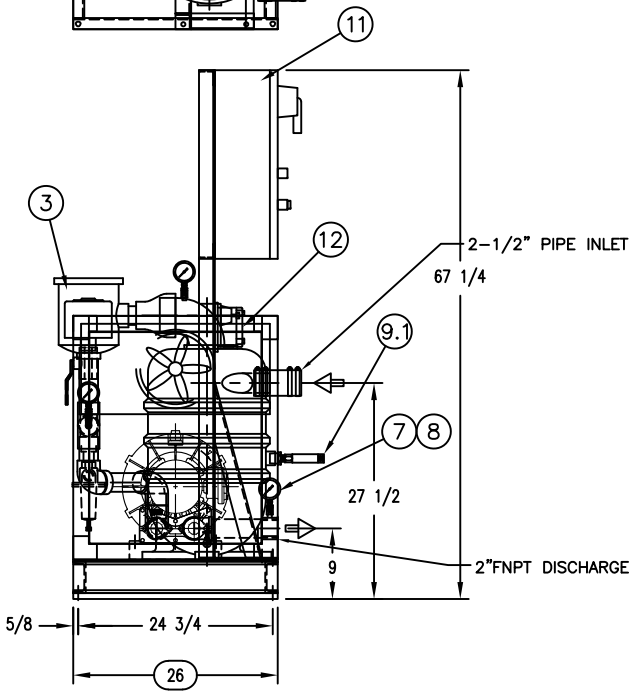
Here	Item	Qty.	Supplier	Description	Part Number	Gasho Part Number	Misc ID	Weight
	1	1	Ametek Rotron	Regenerative Blower	EN505AX72ML	BLW-EN505AX72ML-0000	P/N 038178	92
	2	1	Gasho	Base Frame				160
	3	1	Solberg Mfg.	2" Inline Filter	CSL-851-200HC	FIL-SL2-2.0-F-1050		15
	4	1	Solberg Mfg.	1-1/2" Dilution Valve Filter	FS-19P-150	FS-SL-1.5-F-1050		8
	4.01	1	Apollo	1 1/2" Bronze Ball Valve	77F-107-01	VBL-1.50-BT-0000		2
	5	1	Fisher	1" Relief Valve	289H-41	RV-1.00-B-S-0000	set @ 60" H2O	3
	6	2	Gasho	Vacuum Gauges	25.0.012.HG.160.IWC	GV-2.5-0-012HG/160WC		1
	7	1	Gasho	Pressure Gauge	25.0.006.PSI.160.IWC	GP-2.5-0-06PSI/160WC		1
	8	3	SMC Specialties	Isolation Valves	VA BRS 025-4F4M-BT	VIS-0.25-FM-B-0000		1
	9	1	Ametek Rotron	Moisture Separator	MS200PS	MS-200L-7S-0000	P/N 038519	47
	9.1	1	Dwyer	Level Switch	L6-EPB-B-S-3-O	SW-L7-1.0-BSR-0100		1
	10	1	Accoustic Group	Weather Enclosure	9483 SHT 3 Option 1			70
	10.1	1	McMaster	Ventilation fan, 120V	1976K98	FAN-MC-550-10.0-5000		5
	10.2	1	McMaster	Fan Cord	19155K142	P-MC-19155K1		1
	11	1	ICP	Nema 4 Control Panel	Sentinel Sensaphone		UL, hr meter	100
	12	1	Dwyer	low vacuum switch	1950-20-2F	SW-D7-4.0/20.0W-0000	set @ 10" H2O	3
	13	1	Gasho	Vibration Mat				50
							Total Weight	560











NOTES:
1. CUSTOMER PIPING TO BE INDEPENDENTLY SUPPORTED
2. TOLERANCE ± 1/2"
3. (DIM) ARE CRITICAL DIMENSIONS
4. * DIMENSIONS – REMOVE ITEMS 3, 4, AND 9.1 FOR INSTALLATION. WEATHER HOOD MAY ALSO NEED TO BE REMOVED.

REV.	DATE	DESCRIPTION
A	6/30 2020	ITEM 10 WAS DYER ENCL

DRAWN BY: JJH	DATE 6/19/20
APPROVED BY:	DATE
DIMENSIONS IN INCHES	
SCALE	
TOLERANCE	ANGULAR TOLERANCE
MATERIAL	WEIGHT 600
SHEET 1 OF	

J.E.GASHO & Assoc., Inc.
460 W. GAY ST.
WEST CHESTER, PENNSYLVANIA 19380

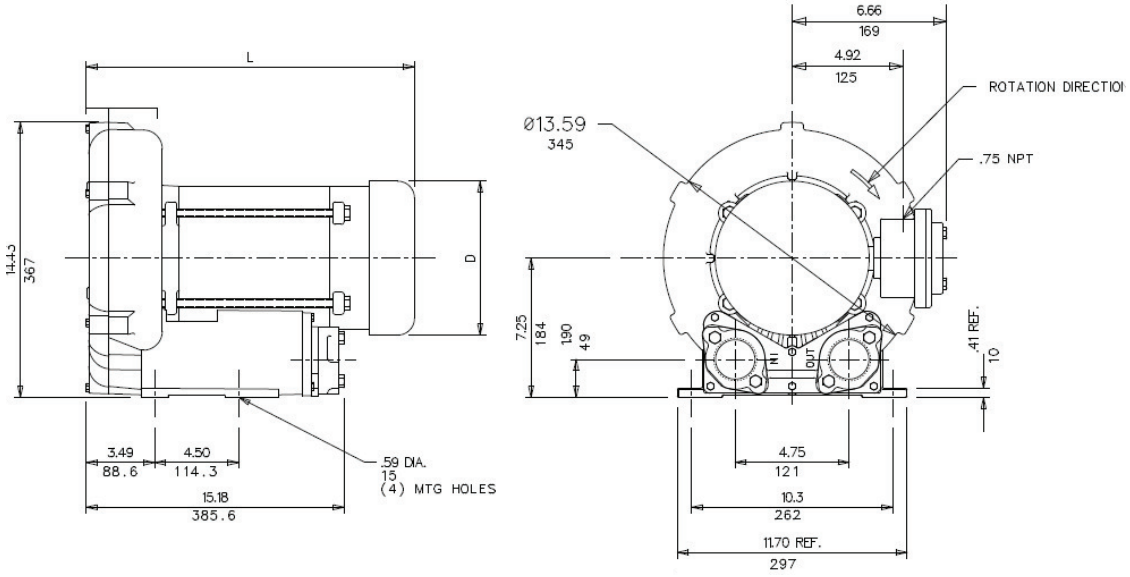
SVE BLOWER PACKAGE
AMETEK EN505AX72ML
2" ENCLOSURE

JG20-F-3455 | A

EN 505 & CP 505

ROTRON®

2.0 / 2.5 HP Sealed Regenerative w/Explosion-Proof Motor



IN
MM

NOTES
1. TERMINAL BOX CONNECTOR HOLE 3/4" NPT.
2. DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3. CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

		Part/Model Number			
		EN505AX58ML	EN505AX72ML	CP505FS58MLR	CP505FS72MLR
Specification	Units	038177	038178	080655	038962
Motor Enclosure - Shaft Mtl.	-	Explosion-proof-CS	Explosion-proof-CS	CHEM XP-SS	CHEM XP-SS
Horsepower	-	2.0	2.0	2.0	2.0
Phase - Frequency	-	Single-60 hz	Three-60 hz	Single-60 hz	Three-60 hz
Voltage	AC	115/230	230/460	115/230	230/460
Motor Nameplate Amps	Amps (A)	22/11	5.8/2.9	22/11	5.8/2.9
Max. Blower Amps	Amps (A)	24/12	6.4/3.2	24/12	6.4/3.2
Locked Rotor Amps	Amps (A)	112/56	56/28	112/56	56/28
Service Factor	-	1/0	0/0	1/0	0/0
Starter Size	-	1.0	1.0	1.0	1.0
Thermal Protection	-	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty
XP Motor Class - Group	-	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G
Shipping Weight	Lbs	92	84	92	84
	Kg	41.7	38.1	41.7	38.1

Voltage - ROTRON motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

Operating Temperatures - Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

Maximum Blower Amps - Corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

XP Motor Class - Group - See Explosive Atmosphere Classification Chart in Section I

This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The performance data on this page depicts typical performance under controlled laboratory conditions. AMETEK is not responsible for blowers driven beyond factory specified speed, temperature, pressure, flow or without proper alignment. Actual performance will vary depending on the operating environment and application. AMETEK products are not designed for and should not be used in medical life support applications. AMETEK reserves the right to revise its products without notification. The above characteristics represent standard products. For product designed to meet specific applications, contact AMETEK Technical & Industrial Products Sales department.

AMETEK DYNAMIC FLUID SOLUTIONS
75 North Street, Saugerties, NY 12477
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Customer Service Fax: +1 215.256.1338
www.ametekdfs.com

AMETEK®
PRECISION MOTION CONTROL
DYNAMIC FLUID SOLUTIONS

Environmental / Chemical Processing Blowers

EN 505 & CP 505

ROTRON®

2.0 / 2.5 HP Sealed Regenerative w/Explosion-Proof Motor

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- Maximum flow: 150 SCFM
- Maximum pressure: 75 IWG
- Maximum vacuum: 70 IWG
- Standard motor: 2.0 HP, explosion-proof
- Cast aluminum blower housing, impeller , cover & manifold; cast iron flanges (threaded); teflon® lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

MOTOR OPTIONS

- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS

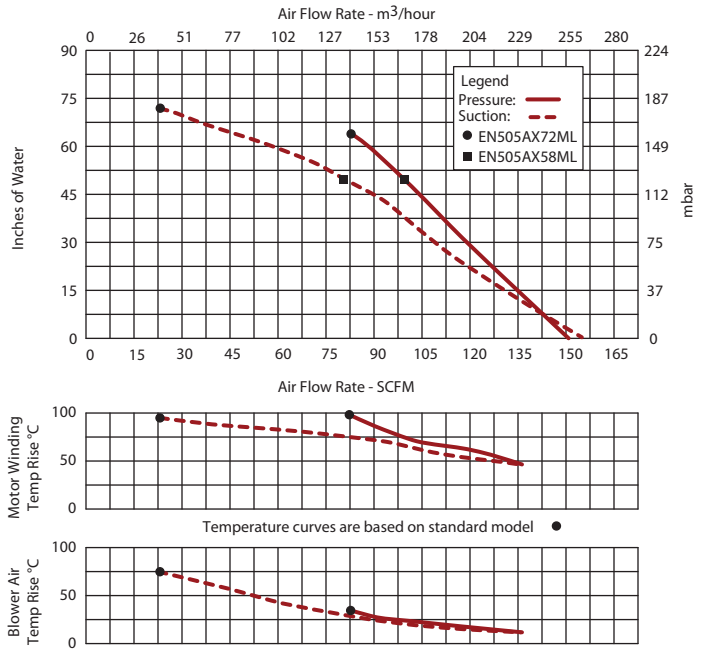
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES

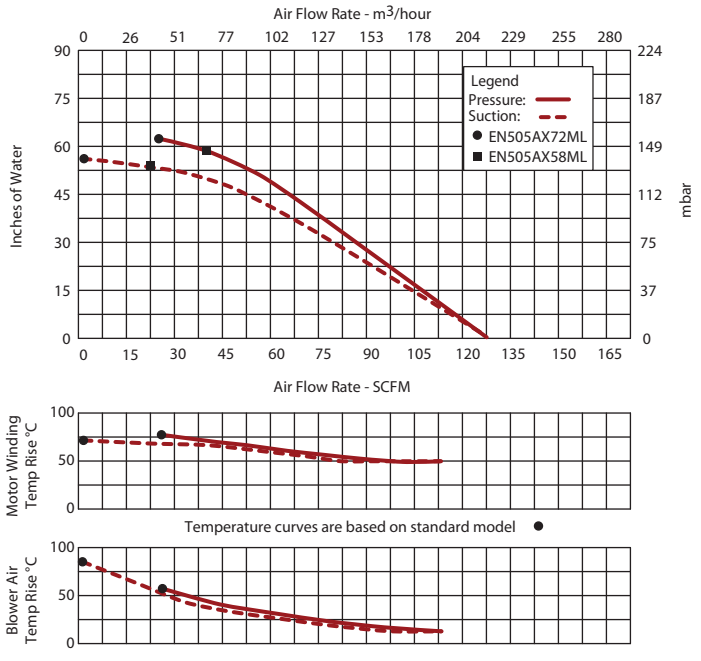
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

Blower Performance at Standard Conditions

60 Hz



50 Hz



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www.ametekdfs.com

AMETEK®
PRECISION MOTION CONTROL
DYNAMIC FLUID SOLUTIONS

SOLBERG®
Filtration • Separation• Silencing

“L” Style Compact Vacuum Filters

CSL Series 3/8” - 4”

Benefits

- Large dirt holding capacity and easy field cleaning, especially when mounted horizontally or inverted
- Low pressure design

Features

- Seamless drawn housings
- O-ring seal
- Corrosive resistant gray powder coat carbon steel
- Stainless steel torsion clips for durability

Technical Specifications

- Vacuum Rating: medium vacuum service*
- Temp (continuous): min -15°F (-26°C) max 220°F (104°C)
- Filter change out differential: 15-20" H_2O over initial ΔP
- Polyester: 99%+ removal efficiency standard to 5 micron
- Paper: 99%+ removal efficiency standard to 2 micron

Options

ATEX Available

- Vacuum gauge
- Higher holding capacity configurations available (select models)
- Material/Finishes: stainless steel, epoxy coating
- Support brackets
- Alternative top-to-canister fastening system for low pressure or pulsating systems
- Stainless steel (select models)

Rev: CSL .38-4-US1904K

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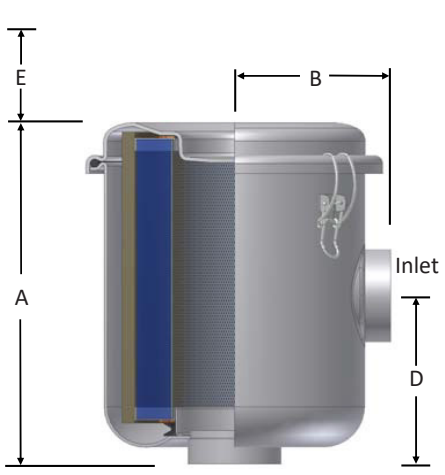
sales@solbergmfg.com

CSL Series 3/8” - 4”



Inlet/Outlet Size	Type	Assembly SCFM Rating	Assembly Part Number Polyester	Paper	Dimensions - inches A	B	C	D	Suggested Service Ht. E	Approx. Weight lbs.	Replacement Element Part No. Polyester	Paper	Element SCFM Rating
3/8”	BSPP	18	**CSL-825-039HCB**	**CSL-824-039HCB**	3 1/8	2 1/8	3 3/4	1 13/16	3”	0.88	825	824	25
1/2”	NPSC	18	**CSL-825-050HCB**	**CSL-824-050HCB**	3 1/2	2 1/4	3 3/4	2	3”	0.88	825	824	25
1/2”	NPSC	20	**CSL-843-050HC**	**CSL-842-050HC**	4	3	5 3/4	2 1/2	3”	3	843	842	55
3/4”	NPSC	24	**CSL-825-075HCB**	**CSL-824-075HCB**	3 1/2	2 5/16	3 3/4	2	3”	0.88	825	824	25
3/4”	NPSC	25	**CSL-843-075HC**	**CSL-842-075HC**	4	3	5 3/4	2 1/2	3”	3	843	842	55
1”	NPSC	35	**CSL-843-100HC**	**CSL-842-100HC**	4 1/4	3 1/4	5 3/4	2 5/8	3”	3	843	842	55
1”	NPSC	40	**CSL-849-100HC**	**CSL-848-100HC**	6 11/16	4 1/8	7 3/8	4 1/2	5”	5	849	848	115
1 1/4”	NPSC	55	**CSL-843-125HC**	**CSL-842-125HC**	4 1/4	3 1/4	5 3/4	2 5/8	3”	3	843	842	55
1 1/4”	NPSC	60	**CSL-849-125HC**	**CSL-848-125HC**	6 11/16	4 1/8	7 3/8	4 1/2	5”	5	849	848	115
1 1/2”	NPSC	80	**CSL-849-150HC**	**CSL-848-150HC**	6 3/4	4 1/8	7 3/8	4 1/2	5”	5	849	848	115
2”	NPSC	175	**CSL-851-200HC**	**CSL-850-200HC**	10 1/4	4 1/2	8 3/4	5	9”	15	851	850	290
2 1/2”	FPT	210	**CSL-851-250HC**	**CSL-850-250HC**	10 11/16	5 1/8	8 3/4	5 1/2	9”	15	851	850	290
3”	FPT	300	**CSL-239-300C**	**CSL-238-300C**	15 3/4	8 13/16	13 1/4	8 11/16	11”	33	239	238	570
3”	MPT	300	**CSL-2541-300B**	**CSL-2540-300B**	15 3/4	9	13 1/4	8 7/8	12”	30	2541	2540	800
4”	MPT	520	**CSL-2541-400B**	**CSL-2540-400B**	16 1/4	9 1/2	13 1/4	9 1/2	12”	32	2541	2540	800

*See Vacuum Filter Technical Data for Vacuum Service Data.

All model offerings and design parameters are subject to change without prior notice.
Contact your representative or Solberg for the most current information.

SOLBERG®
Filtration & Separation

Technical Data

Inlet Vacuum Filters

Applications & Equipment

- Industrial & Severe Duty
- Vacuum Pumps & Systems: Roots, Rotary Vane, Screw, Piston
- Vacuum Packaging Equipment
- Vacuum Furnace
- Blowers: Side Channel & P.D.
- Vacuum Lifters
- Intake Suction Filters
- Food Industry
- Woodworking/Routers
- Ash Handling
- Printing Industry
- Medical/Hospital
- Remote Installations for Piston & Screw Compressors
- Paper Processing
- Waste Water Aeration
- Cement Processing
- Bag House Systems
- Vacuum Vent Breathers
- Chemical Processing
- Factory Automation Equipment
- Leak Detection Systems

Identification

Standard Solberg assemblies should have an identification label/nameplate that gives the following information:

- Assembly Model #
- Replacement Element #

The part number designates the filter type, the element configuration and housing connection size. For example, the following part number identifies the filter as being a “CSL” design filter with a “235” element, “P” prefilter and 4” flange connection size.

CSL-235P-400F

- Connection Size and Type
- Replacement Element Part Number
- Filter Type

Vacuum Service Rating Chart

Threaded vacuum filter connections must be free of defect and properly sealed to achieve deeper vacuum levels. Vacuum service levels are given for reference only and serve as a guideline for product selection. Product certification and alternative designs are available for applications requiring deeper vacuum levels and specific leak rates. Please contact factory for details.

Vacuum Level	Pressure (mbar)	Pressure (Torr)	Pressure (Pa)
Atmospheric Pressure	1013	760	$1.013x10^{+5}$
Coarse Vacuum	1013 to 33	760 to 25	$1x10^{+5}$ to $3x10^{+3}$
Medium Vacuum	33 to $1.3x10^{-3}$	25 to $1x10^{-3}$	$3x10^{+3}$ to $1x10^{-1}$
High Vacuum	$1.3x10^{-3}$ to $1.3x10^{-9}$	$1x10^{-3}$ to $1x10^{-9}$	$1x10^{-1}$ to $1x10^{-7}$

Rev: IVTD-US1904K

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Inlet Vacuum Filters

Choosing the Best Filter for Your Equipment

A. When the connection & airflow is known:

1. select the appropriate connection style. (i.e.: MPT, Flange, NPSC, etc.)
2. check assembly SCFM (flow) rating. Compare with your required airflow.

(Note: Assembly flow ratings are based on 6,000 FPM or 30m/sec for a given connection size to achieve low pressure drop performance. When required flow exceeds assembly flow rating, the pressure drop through the outlet connection will increase. In such cases select by element SCFM (flow) rating.)

3. when required flow rating matches connection size; skip to "C. Selecting Elements".

B. When the connection size is unknown, flexible, or the required flow rating exceeds assembly flow rating:

1. match required flow rating with the element flow rating.
2. choose related connection size.

C. Selecting Elements: The filter performance is influenced by the actual application duty and the equipment it is installed on. Regular maintenance checks and proper servicing is required.

Application Duty Descriptions:

Industrial Duty: clean workshop or clean outdoor environment - small element sizing is sufficient.

Severe Duty: dirty workshop, wastewater – medium to large element is recommended.

Extreme Duty: cement, steel making, plastics or dusty material conveying – largest element sizing is recommended.

1. Select media required by your application. Options include:
    a. Standard media
        1. Polyester: all purpose; withstands pulses, moisture, and oily air
        2. Paper: mostly dry, smooth flow applications
    b. Special Media: for a variety of micron levels and media types, see the "Filter Media Specifications" in the Replacement Element Section or contact Solberg.
2. Select element size by matching the element with the anticipated duty and upsize accordingly.

Filter Assembly Maintenance

Request the appropriate maintenance manual for more in-depth information from your Solberg representative or on our website www.solbergmfg.com.

Element Maintenance

Solberg elements should be replaced once the pressure drop reaches 15-20" H_2O above the initial pressure drop of the installation. Cleaning the element is also an option.

Solberg recommends replacing dirty elements for optimal performance. Any damage which results from by-pass or additional pressure drop created by element cleaning is the sole responsibility of the operator.

Note: The overall performance of a filter element is altered once cleaned. The initial pressure drop after subsequent cleanings will be greater than the original, clean pressure drop of the element. After each cleaning, the pressure drop will continue to increase. Under all circumstances, the initial pressure drop of the element needs to be maintained at less than 15" H_2O.

If the pressure drop exceeds 20" H_2O at start-up; it should be replaced with a new element. With many types of equipment, the maximum pressure drop allowed will be dictated by the ability of the equipment to perform to its rated capacity. Under all circumstances, the operator should avoid exceeding the manufacturer's recommended maximum pressure drop for their specific equipment.

All model offerings and design parameters are subject to change without prior notice.
Contact your representative or Solberg for the most current information.

SOLBERG®
Filtration • Separation• Silencing

Compact Filter Silencers

FS Series 1/2” - 6”

Features

- Fully drawn weatherhood
- Tubular silencing design - tubes are positioned to maximize attenuation and air flow while minimizing pressure drop
- Corrosive resistant gray powder coat carbon steel

Technical Specifications

- Temp (continuous): min -15°F (-26°C) max 220°F (104°C)
- Filter change out differential: 15-20” H_2O over initial Δ P
- Pressure drop graphs available upon request
- Polyester: 99%+ removal efficiency standard to 5 micron
- Paper: 99%+ removal efficiency standard to 2 micron

Options

ATEX Available

- Tap holes available
- Pressure drop indicator
- Various media for different environments
- Stainless steel construction
- Various nonstandard finishes and connection styles
- Side Access Silencer Filters (LQB Series) for space restricted enclosures (select models)

Threaded Outlet Assembly

Flange Outlet Assembly

Rev: FS .5-6-US1903K

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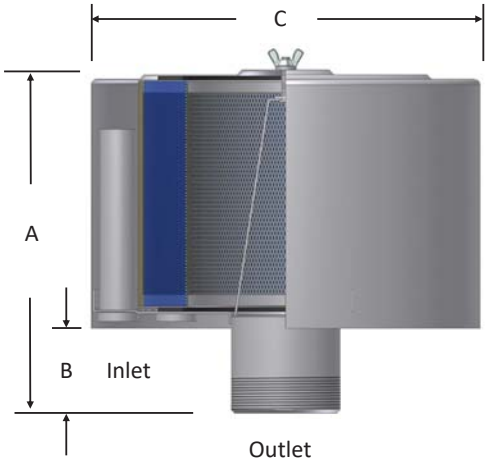
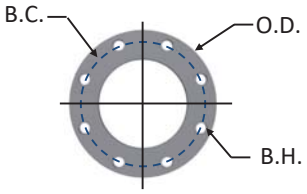
FS Series 1/2” - 6”





O.D.: Outside Diameter
B.C.: Bolt Circle
B.H.: Bolt Hole

125/150# Pattern Flange	Dimensions - inches			No. of Holes	Flange Thickness
	O.D.	B.C.	B.H.		
4”	9	7 ½	0.75	8	0.5
5”	10	8 ½	0.88	8	0.5
6”	11	9 ½	0.88	8	0.5

MPT Outlet	Assembly SCFM Rating	Assembly Part Number		Dimensions - inches			Suggested Service ht. inches	No. of Silencing Tubes	Approx. Weight lbs.	Replacement Element Part No.		Element SCFM Rating
		Polyester	Paper	A	B	C				Polyester	Paper	
½”	10	FS-15-050	FS-14-050	3 7/16	1	6	3	1	2	15	14	35
¾”	25	FS-15-075	FS-14-075	4	1 ¼	6	3	2	2	15	14	35
1”	35	FS-15-100	FS-14-100	4	1 5/16	6	3	3	2	15	14	35
1”	55	FS-19P-100	FS-18P-100	6 ⅜	1 7/16	6	5	3	3	19P	18P	100
1 ¼”	70	FS-19P-125	FS-18P-125	6 ¾	1 ⅝	6	5	5	3	19P	18P	100
1 ½”	85	FS-19P-150	FS-18P-150	6 ¾	1 ⅝	6	5	5	4	19P	18P	100
2”	135	FS-31P-200	FS-30P-200	7 ½	2 ¼	10	5	5	8	31P	30P	195
2”	135	FS-231P-200	FS-230P-200	12	2 ⅜	10	10	5	14	231P	230P	300
2 ½”	195	FS-31P-250	FS-30P-250	7 ½	2 ½	10	5	5	8	31P	30P	195
2 ½”	195	FS-231P-250	FS-230P-250	12 ⅜	2 ⅝	10	10	9	15	231P	230P	300
3”	300	FS-231P-300	FS-230P-300	12 ¾	3 ⅛	10 ¼	10	9	15	231P	230P	300
3”	300	FS(12)-235P-300	FS(12)-234P-300	12 ⅞	2 11/16	12 ¼	10	3	29	235P	234P	570
3”	300	FS-275P-300	FS-274P-300	13	3	16	10	9	33	275P	274P	1100
4”	520	FS(12)-235P-400	FS(12)-234P-400	13 ⅞	3 11/16	12 ¼	10	6	29	235P	234P	570
4”	520	FS-275P-400	FS-274P-400	14	4	16	10	9	34	275P	274P	1100
5”	800	FS-245P-500	FS-244P-500	14	4 ⅛	16	10	14	33	245P	244P	880
5”	800	FS-275P-500	FS-274P-500	14	4 ⅛	16	10	14	36	275P	274P	1100
6”	1100	FS-275P-600	FS-274P-600	15	5 ⅛	16	10	18	38	275P	274P	1100

Flange Outlet	Assembly SCFM Rating	Assembly Part Number		Dimensions - inches			Suggested Service ht. inches	No. of Silencing Tubes	Approx. Weight lbs.	Replacement Element Part No.		Element SCFM Rating
		Polyester	Paper	A	B	C				Polyester	Paper	
4”	520	FS(12)-235P-400F	FS(12)-234P-400F	13 ⅞	3 11/16	12 ¼	10	6	32	235P	234P	570
4”	520	FS-275P-400F	FS-274P-400F	14	4	16	10	9	39	275P	274P	1100
5”	800	FS-245P-500F	FS-244P-500F	14	4 ⅛	16	10	14	38	245P	244P	880
5”	800	FS-275P-500F	FS-274P-500F	14	4 ⅛	16	10	14	41	275P	274P	1100
6”	1100	FS-275P-600F	FS-274P-600F	15	5 ⅛	16	10	18	42	275P	274P	1100

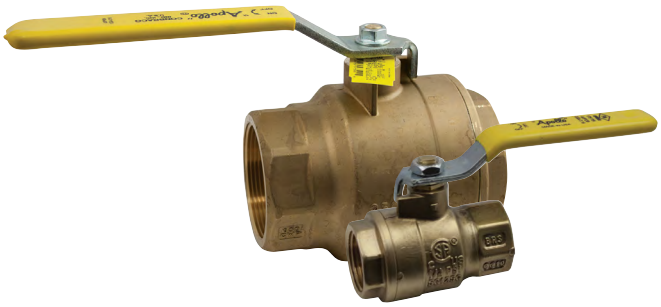
See Filter Silencer Technical Data for sizing guidelines.

All model offerings and design parameters are subject to change without prior notice.
Contact your representative or Solberg for the most current information.

"Apollo" Valves SUBMITTAL SHEET

77F-100 Series

Full Port Threaded End Brass Ball Valve



Job Name:	
Job Location:	
Engineer:	
Contractor:	
Tag:	
PO#:	
Rep:	
Wholesale Dist.:	

DESCRIPTION

The Apollo 77F-100 Series is a full port forged brass ball valve suitable for a wide range of flow control applications including HVAC, fuel gas, fire protection, irrigation etc. These NPT threaded, 2-piece valves combine reliable operation with maximum economy. Valves include most pertinent agency approvals. Proudly Made in the USA.

FEATURES

- Heavy Pattern Forged Design
- Corrosion Resistant Materials
- Full-Port Flow
- Premium RPTFE Seats and Packing
- Adjustable Stem Packing
- Blowout-Proof Stem
- 2-1/2" - 4" Sizes Now Feature 316SS Ball and Stem (Standard)
- Silicone Free Assembly
- 100% Factory Tested
- **Made in USA, ARRA Compliant**

PERFORMANCE RATING

- Rating: 600 CWP (1/4" – 2")
- Rating: 400 CWP (2-1/2" – 4")
- Steam Rating: 150 psi SWP
- Temperature Range: 0°F - 400°F
- Vacuum Service to 29 in. Hg

Not intended for potable water in USA

OPTIONS

- (-01) Standard Lever
- (-04) 2-1/4" Stem Extension 1/4" – 2-1/2"
- (-07) Tee Handle 1/4" – 2"
- (-10) Stainless Steel Lever & Nut 1/4" – 2"
- (-11) Therma-Seal™ Insulating Tee Handle 1/4" – 2"
- (-27) Locking Handle SS 1/4" – 2-1/2"
- (77F140 Series) – SS Ball & Stem
- (77FLF Series) Lead Free (0.25% Lead Max)

STANDARD MATERIALS LIST

BODY	Brass, ASTM B283 alloy C37700
SEAT	RPTFE
BALL	Brass, ASTM B16, C36000 or B283, C37700 Chrome Plated 316 SS (2-1/2" - 4")
STEM PACKING	RPTFE
NUT	Corrosion Resistant Plated Steel
STEM	Brass, ASTM B16, C36000 316 SS (2-1/2" - 4")
RETAINER	Brass, ASTM B283 alloy C37700 or ASTM B16, C3600
HANDLE	Plated Steel / Insulated Polyvinyl
GLAND	Brass, ASTM B16, C36000

APPROVALS

- MSS SP-110
- IAPMO/ANSI Z1157

FM LISTED

- FM 1140 (<175 PSI) (1/4" – 2")

CSA LISTED

- CGA 3.16 (125 PSI)
- CGA CR91-002 (5 PSI)
- ANSI Z21.15/CSA 9.1 (1/2 PSI)
- ASME B16.44 (5 PSI)
- ASME B16.33 (125 PSI) (1/2" – 2")

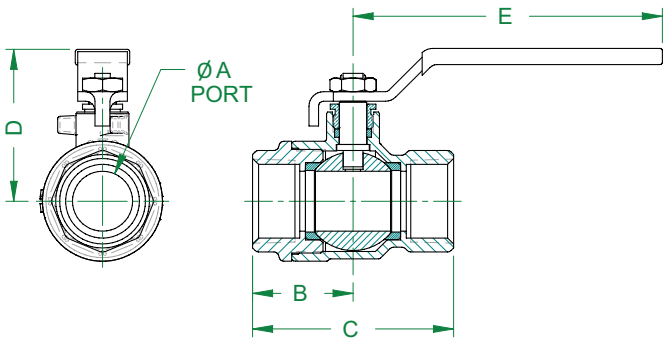
UL LISTED

- UL 125 - Flow Control Valves for LP-Gas, Guide YSDT to 250 psi max
- UL 258 - Fire Protection Trim & Drain, Guide VQGU to 175psi max (1/4" – 2")
- UL 842 - Valves for Flammable Fluids, Guides YRBX, YRPV, and MHKZ to 250 psi max. (1/4" - 4" NPT only)
- UL 1477 - Compressed Gas Shutoff Valves, Guide YQNZ to 250 psi max (1/4" - 4" NPT only)

Gas approvals apply to NPT models only

DIMENSIONS

PART NUMBER	SIZE (IN.)	DIMENSIONS (IN.)					WT. (LB.)
		A	B	C	D	E	
77F-101-01	1/4"	0.38	0.81	1.62	1.61	2.85	0.3
77F-102-01	3/8"	0.38	0.85	1.70	1.61	2.85	0.3
77F-103-01	1/2"	0.50	1.14	2.25	1.66	2.85	0.5
77F-104-01	3/4"	0.75	1.29	2.57	1.91	3.86	0.8
77F-105-01	1"	1.00	1.60	3.20	2.11	3.86	1.3
77F-106-01	1-1/4"	1.25	1.73	3.46	2.44	4.75	2.1
77F-107-01	1-1/2"	1.50	2.00	4.00	2.91	5.42	3.2
77F-108-01	2"	2.00	2.37	4.74	3.69	7.77	5.6
77F-149-01	2-1/2"	2.50	2.99	5.98	4.14	7.77	12.8
77F-140-01	3"	3.00	3.52	7.05	5.03	9.92	19.7
77F-14A-01	4"	4.00	3.83	7.65	5.70	14.78	25.5



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aalberts integrated piping systems

October 2014

289 Series Spring-Loaded Relief Valves

1 NPT TYPES 289H AND 289HH

2 NPT TYPE 289H

TYPE 289L

TYPES 289U AND 289A

Figure 1. *Types 289H, 289L and 289U Relief Valves*

Introduction

The 289 Series relief valve is a throttling relief valve used downstream of pressure regulators to protect the downstream system from overpressure. A smooth throttling action minimizes pressure surges in the system during emergency operation. These relief valves are available in 1/4, 3/4, 1 or 2 NPT sizes with spring ranges (relief pressure settings) from 5 in. w.c. to 75 psig / 12 mbar to 5.2 bar.

All sizes above 1/4 NPT feature a pitot tube booster (Figure 1) for achieving the highest possible relief capacity with a minimum buildup of system pressure. When the valve is opening, high gas velocity through the orifice creates an area of relatively low pressure near the end of the pitot tube. This pitot tube effect forms a partial vacuum above the diaphragm which helps to open the valve.

The relief valve diaphragm functions as a valve disk to control flow in all types except the Types 289H and 289HH, which use O-ring seats. The Nitrile (NBR) or Neoprene (CR) seating surfaces provide tight shutoff. The 289 Series relief valves are ideal for low-pressure settings due to the increased sensitivity provided by the large diaphragm area.

Features

- **Throttling Type Relief**—Smooth, sensitive throttling action minimizes pressure surges.
- **High Flow Rates**—As shown by the Figure 3 capacity curves, high flow rates can be achieved with minimum pressure buildup due to the boosting system which increases the relief valve opening.
- **Small Size**—The 289 Series relief valves are small and compact, making them suitable for areas limited in space.
- **Reliability Due to Simplicity**—A single internal assembly decreases the possibility of mechanical failure.

D100154X012

Specifications

Available Configurations

Type 289A: 1/4 NPT spring-loaded relief valve for relief pressure settings of 3 to 22 psig / 0.21 to 1.5 bar, two spring ranges

Type 289H: 1 or 2 NPT spring-loaded relief valve for relief pressure settings of 1 to 50 psig / 0.07 to 3.4 bar four spring ranges, in the 1 NPT and of 7 in. w.c. to 10 psig / 17 mbar to 0.69 bar, four spring ranges, in the 2 NPT

Type 289HH: 1 NPT spring-loaded relief valve for relief pressure settings of 45 to 75 psig / 3.1 to 5.2 bar

Type 289L: 3/4 or 1 NPT spring-loaded relief valve for relief pressure settings of 10 to 40 in. w.c. / 25 to 99 mbar, two spring ranges

Type 289U: 1/4 NPT spring-loaded relief valve for relief pressure settings of 5 in. w.c. to 3 psig / 12 mbar to 0.21 bar, two spring ranges

Inlet Connections

Type 289L: 3/4 or 1 NPT
Types 289A and 289U: 1/4 NPT
Type 289H: 1 or 2 NPT
Type 289HH: 1 NPT

Outlet (Vent) Connections

Same size as inlet connection

Maximum Allowable Relief (Inlet) Pressure[1] and Maximum Relief Set Pressure

See Table 1

Capacity Data

See Figure 3

Standard Construction Materials

Valve Body and Spring Case
Types 289A and 289U: Zinc
Types 289H (1 NPT), 289HH and 289L: Aluminum
Type 289H (2 NPT): Cast iron body with Aluminum spring case

Diaphragm
Type 289A: Neoprene (CR)
Types 289H and 289HH: Nitrile (NBR) or Fluorocarbon (FKM)
Types 289L and 289U: Nitrile (NBR)

Standard Construction Materials (continued)

Orifice
Types 289A and 289L: Aluminum
Type 289H (2 NPT Only): Brass or Stainless steel

O-ring Seat (Types 289H and 289HH Only):
Nitrile (NBR) or Fluorocarbon (FKM)[2]

O-ring Seat Holder and Washer (1 NPT Types 289H and 289HH Only):
Aluminum

Seat Washer (2 NPT Type 289H Only):
Stainless steel

Pitot Tube
Types 289H, 289HH (1 NPT) and 289L: Aluminum
Type 289H (2 NPT): Brass or Stainless steel

Gaskets
Type 289L: Neoprene (CR)
All Others: Composition

Spring: Zinc-plated steel

Diaphragm Plate
Types 289A and 289U: Zinc
All Others: Zinc-plated steel

Closing Cap
Type 289L: Plastic, Aluminum or Zinc
Type 289H (2 NPT): Zinc

Temperature Capabilities[1]

With Nitrile (NBR) and Neoprene (CR) Elastomer:
-20 to 150°F / -29 to 66°C

With Fluorocarbon (FKM):
20 to 300°F / -7 to 149°C
Available with Types 289H and 289HH only

Approximate Weights

Types 289A and 289U: 0.75 lbs / 0.3 kg
Type 289H
1 NPT: 4 lbs / 2 kg
2 NPT: 15 lbs / 7 kg
Type 289HH: 4 lbs / 2 kg
Type 289L: 15 lbs / 7 kg

Options

- Polytetrafluoroethylene (PTFE) diaphragm protector (Types 289A and 289U only)
- Wire-seal on closing cap (1 NPT Type 289L only)

1. The pressure/temperature limits in this Bulletin and any applicable standard limitation should not be exceeded.
2. Bubble-tight shutoff cannot be attained at settings below 5 psig / 0.34 bar with Fluorocarbon (FKM) O-ring seat.

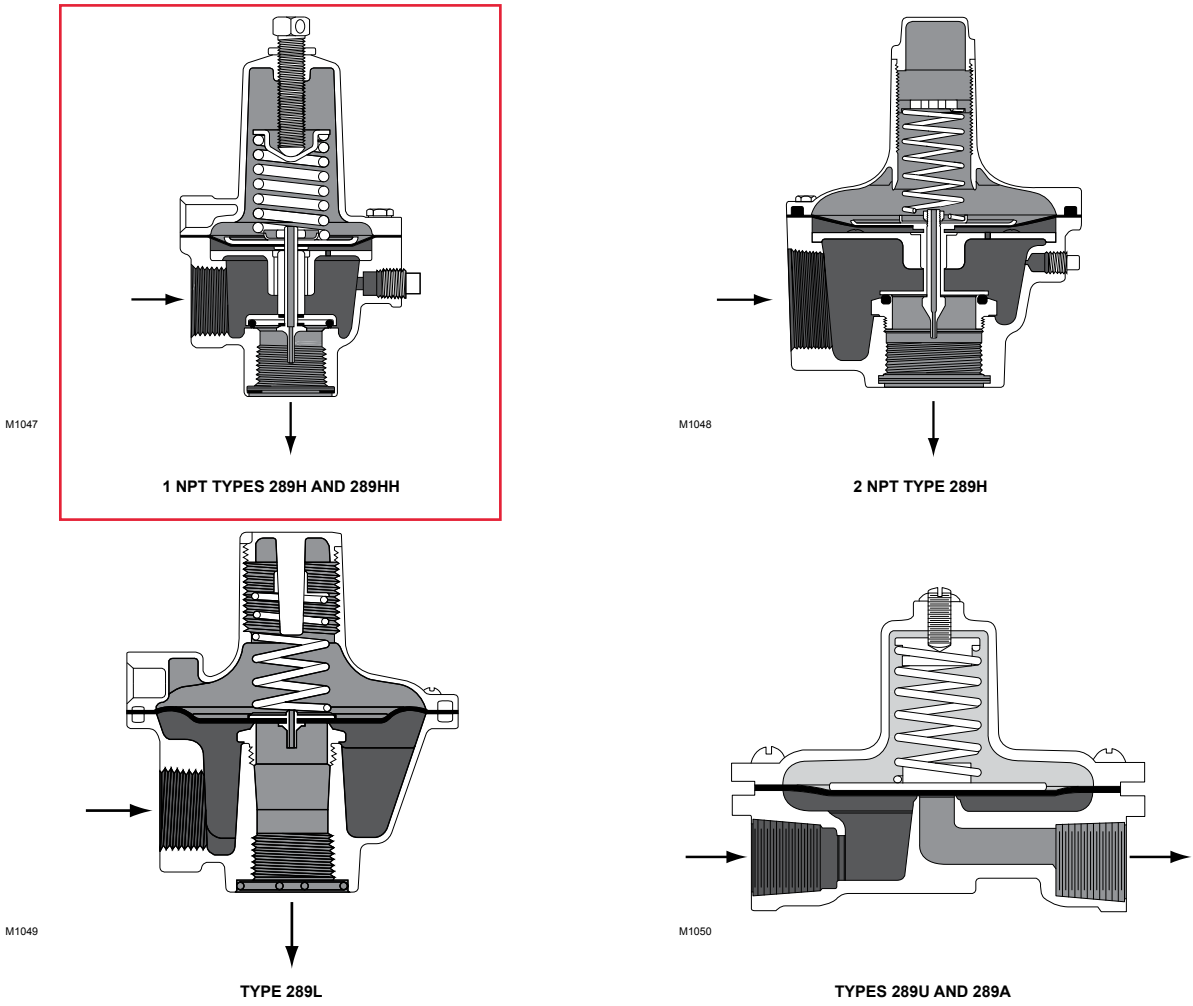
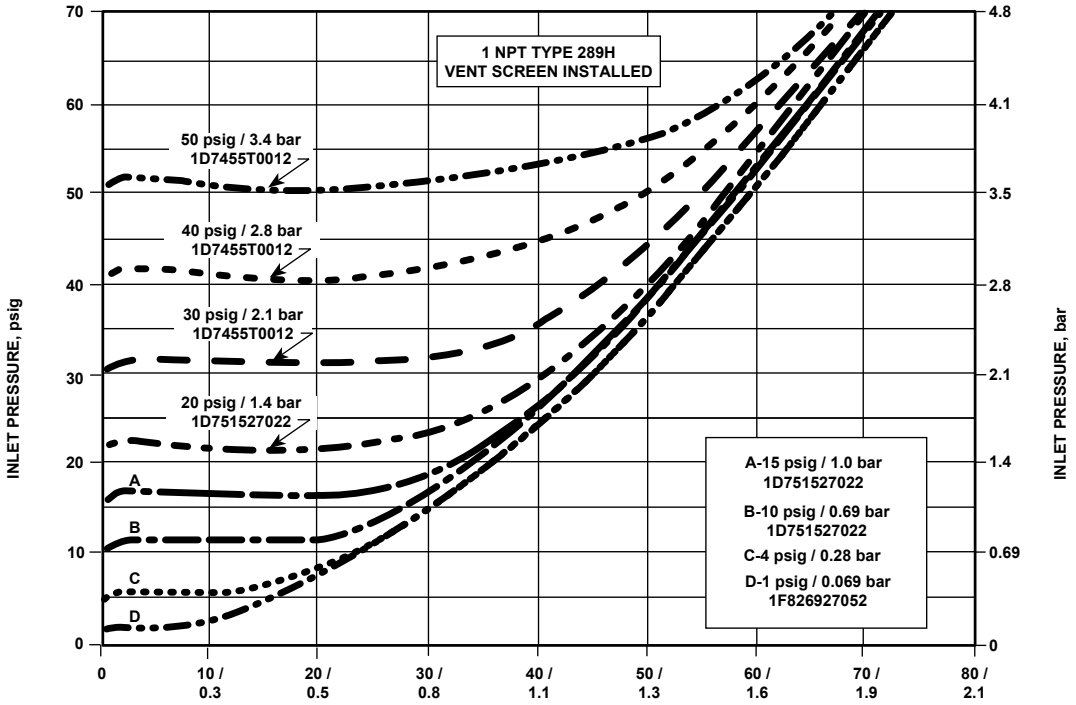


Figure 2. *Types 289H, 289L and 289U Operational Schematics*

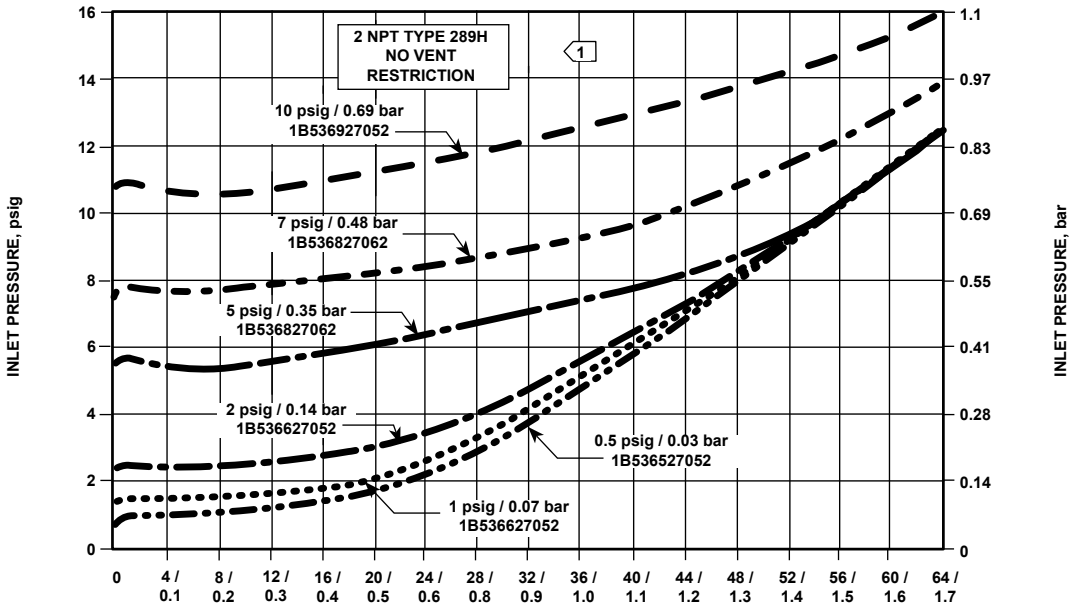
Table 1. *Maximum Allowable Relief (Inlet) Pressure*

AVAILABLE CONFIGURATION	BODY SIZE, NPT	SPRING PART NUMBER	COLOR CODE	SPRING RANGE (RELIEF PRESSURE SETTINGS)		MAXIMUM ALLOWABLE RELIEF (INLET) PRESSURE[1]	
				psig	bar	psig	bar
Type 289A	1/4	0Z056327022 1B268227022	Silver Silver	3 to 13 11 to 22	0.21 to 0.90 0.76 to 1.5	45	3.1
Type 289H	1	1F826927052 1D892327022 1D751527022 1D7455T0012	Pink Red Silver Green	1 to 4.5 4 to 15 10 to 20 15 to 50	0.07 to 0.31 0.28 to 1.0 0.69 to 1.4 1.0 to 3.5	100	6.9
	2	1B536527052 1B536627052 1B536827062 1B536927052	Dark Blue Gray Dark Green Red Stripe	7 to 18 in. w.c. 0.5 to 2.25 1.75 to 7 4 to 10	17 to 45 mbar 0.03 to 0.16 0.12 to 0.48 0.28 to 0.69	25	1.7
Type 289HH	1	1D7455T0012	Green	45 to 75	3.1 to 5.2	100	6.9
Type 289L	3/4 or 1	13A7917X012 13A7916X012	Silver Red Stripe	10 to 18 in. w.c. 12 to 40 in. w.c.	25 to 45 mbar 30 to 99 mbar	7	0.48
Type 289U	1/4	0V060227022 0F058227022	Silver Silver	5 to 25 in. w.c. 20 in. w.c. to 3 psig	12 to 62 mbar 50 to 207 mbar	10 psig	0.69

1. This value indicates the relief pressure setting plus pressure build-up.



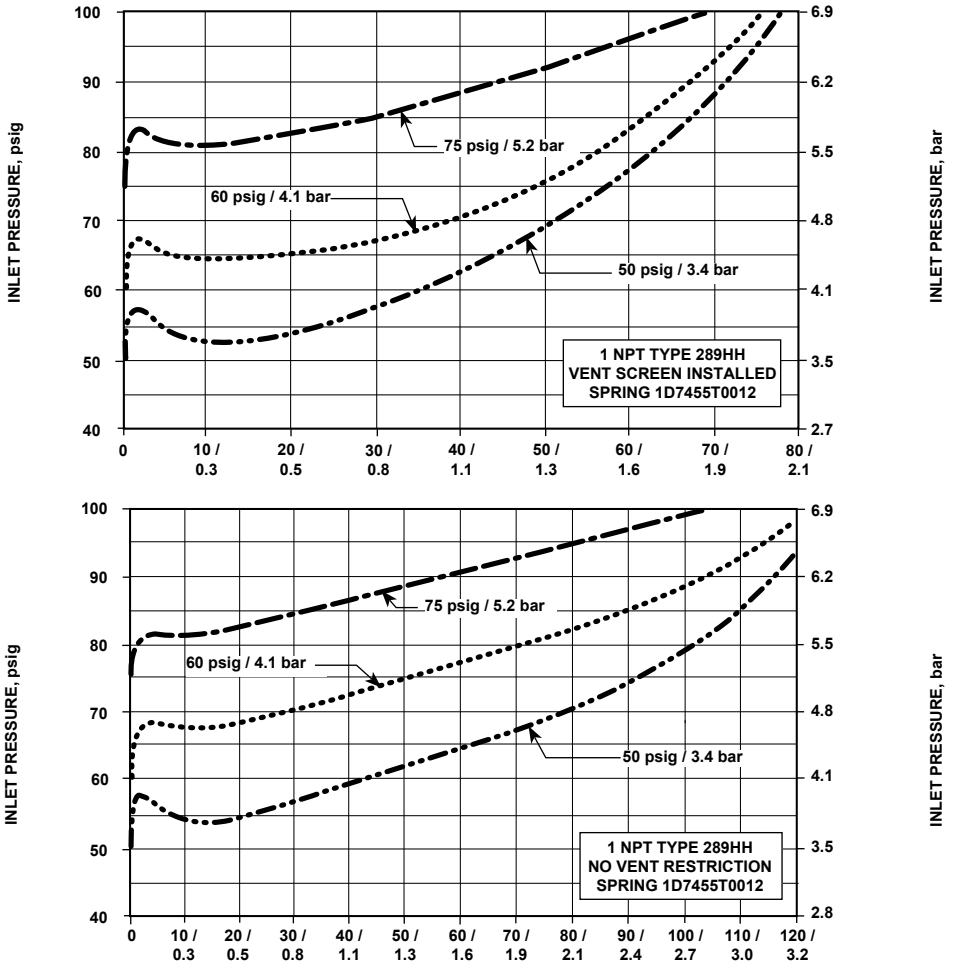
CAPACITIES IN THOUSANDS OF SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS AT 14.7 psia AT 60°F / 1.01325 bar AT 0°C



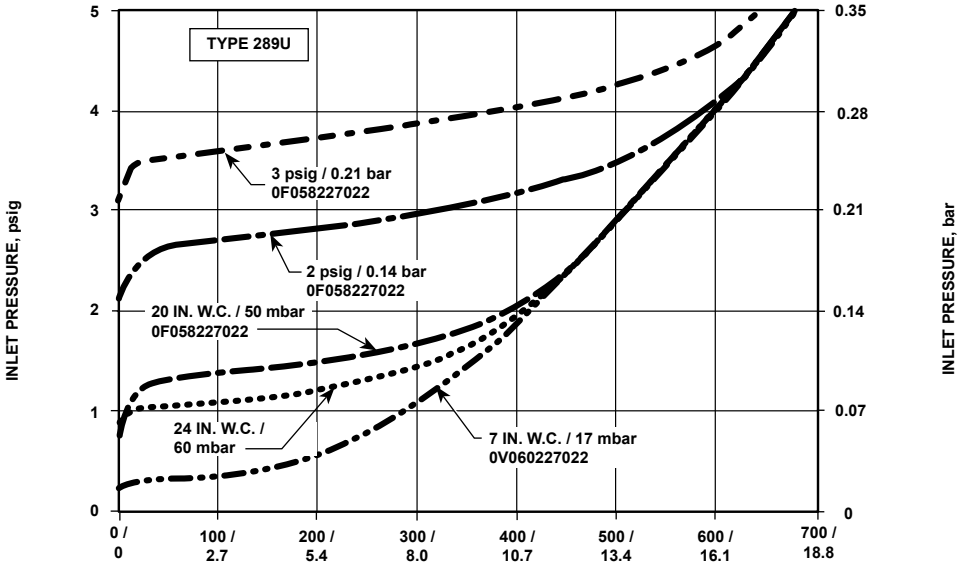
CAPACITIES IN THOUSANDS OF SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS AT 14.7 psia AT 60°F / 1.01325 bar AT 0°C

NOTE:
1. LESS THAN A 5% CAPACITY LOSS CAN BE EXPECTED WITH THE VENT SCREEN INSTALLED ON THE 2 NPT TYPE 289H AT MAXIMUM FLOW.
2. WHEN SELECTING ANY RELIEF VALVE FOR INSTALLATION DOWNSTREAM OF THE REGULATOR, THE CAPACITY OF THE RELIEF VALVE SHOULD BE COMPARED WITH THE WIDE-OPEN CAPACITY OF THE REGULATOR.
3. BUBBLE POINT RELIEF SETTING AND SPRING PART NUMBER ARE NOTED ON EACH CURVE.
4. TO CONVERT TO EQUIVALENT CAPACITIES OF OTHER GASES, MULTIPLY VALUES OBTAINED FROM CURVE BY THE FOLLOWING FACTORS: AIR = 0.78, PROPANE = 0.628, BUTANE = 0.548, NITROGEN = 0.789.

Figure 3. *Capacity Curves*



CAPACITIES IN THOUSANDS OF SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS AT 14.7 psia AT 60°F / 1.01325 bar AT 0°C

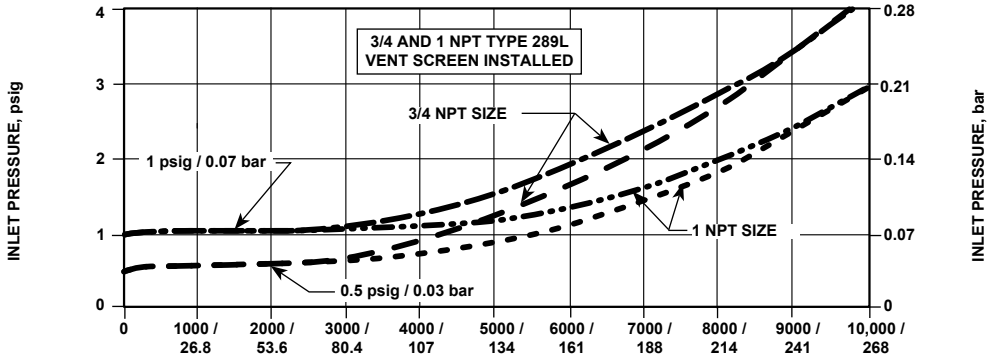


**CAPACITIES IN 0.6 SPECIFIC GRAVITY GAS —
CUBIC FEET PER HOUR / Nm³/h—14.7 psia AT 60°F / 1.01325 bar AT 0°C**

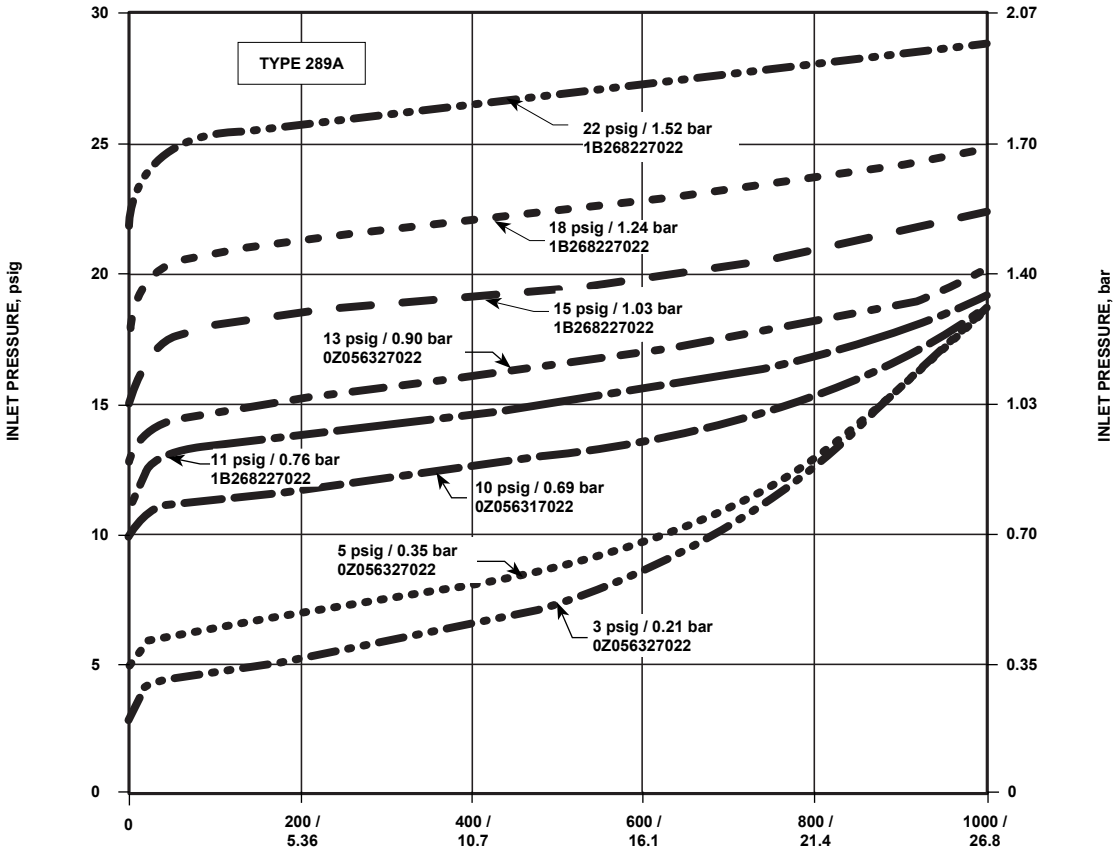
NOTE:

1. **WHEN SELECTING ANY RELIEF VALVE FOR INSTALLATION DOWNSTREAM OF THE REGULATOR, THE CAPACITY OF THE RELIEF VALVE SHOULD BE COMPARED WITH THE WIDE-OPEN CAPACITY OF THE REGULATOR.**
2. **BUBBLE POINT RELIEF SETTING AND SPRING PART NUMBER ARE NOTED ON EACH CURVE.**
3. **TO CONVERT TO EQUIVALENT CAPACITIES OF OTHER GASES, MULTIPLY VALUES OBTAINED FROM CURVE BY THE FOLLOWING FACTORS: AIR = 0.78, PROPANE = 0.628, BUTANE = 0.548, NITROGEN = 0.789.**

Figure 3. *Capacity Curves (continued)*



CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS AT 14.7 PSIA AT 60°F / 1.01325 bar AT 0°C



CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS AT 14.7 psia AT 60°F / 1.01325 bar AT 0°C

NOTE:
1. WHEN SELECTING ANY RELIEF VALVE FOR INSTALLATION DOWNSTREAM OF THE REGULATOR, THE CAPACITY OF THE RELIEF VALVE SHOULD BE COMPARED WITH THE WIDE-OPEN CAPACITY OF THE REGULATOR.
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Figure 3. *Capacity Curves (continued)*

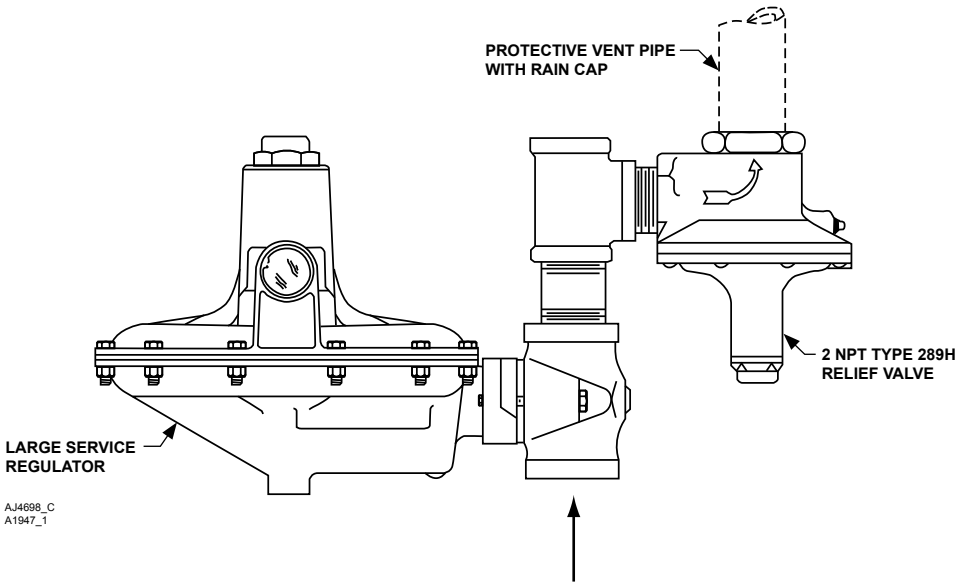

Figure 4. *Typical Installation of a 289 Series Relief Valve*

Installation

The 289 Series relief valves may be installed in any position. However, the outlet connection must be protected against the entrance of rain, snow, insects or any other foreign material that may plug the outlet or affect the opening and closing of the valve (see Figure 4). If it is necessary to pipe away the outlet, remove the outlet screen (if one is present).

Flow through the valve must be as indicated by the flow direction arrow on the body (inlet connection is marked on some sizes).

The spring case vent on the 2 NPT Type 289H is tapped and plugged. This vent opening must remain plugged to allow the pitot tube booster to function.

Overpressure

Overpressure conditions in a regulating system may cause personal injury or equipment damage due to bursting of pressure-containing parts or explosion of accumulated gas. Check the system for damage if any of the maximum allowable relief (inlet) pressure ratings in Table 1 are exceeded.

Ordering Information

When ordering, specify:

1. Type number and size
2. Relief pressure range and setting desired
3. Type of gas (natural gas, air, etc.); list any factors such as impurities in the gas that may affect compatibility of the gas with valve trim parts
4. Temperature and specific gravity of the gas
5. Maximum relief (inlet) pressure and flow rate desired
6. Line size and end connection size of adjacent piping
7. For Types 289H and 289HH, specify material of diaphragm and O-ring seat; for 2 NPT Type 289H, specify material of orifice and pitot tube
8. Options desired, if any.

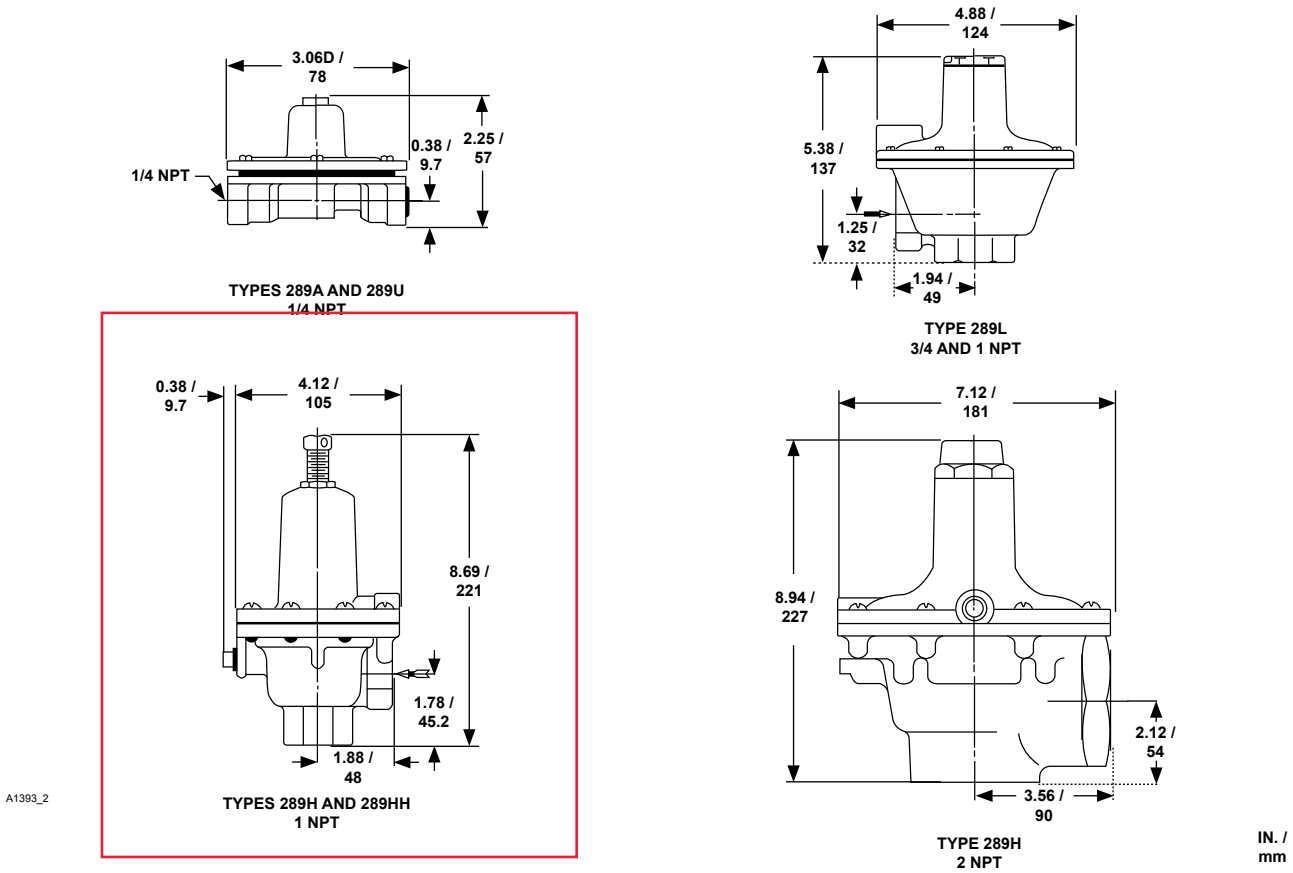

Figure 5. *Dimensions*

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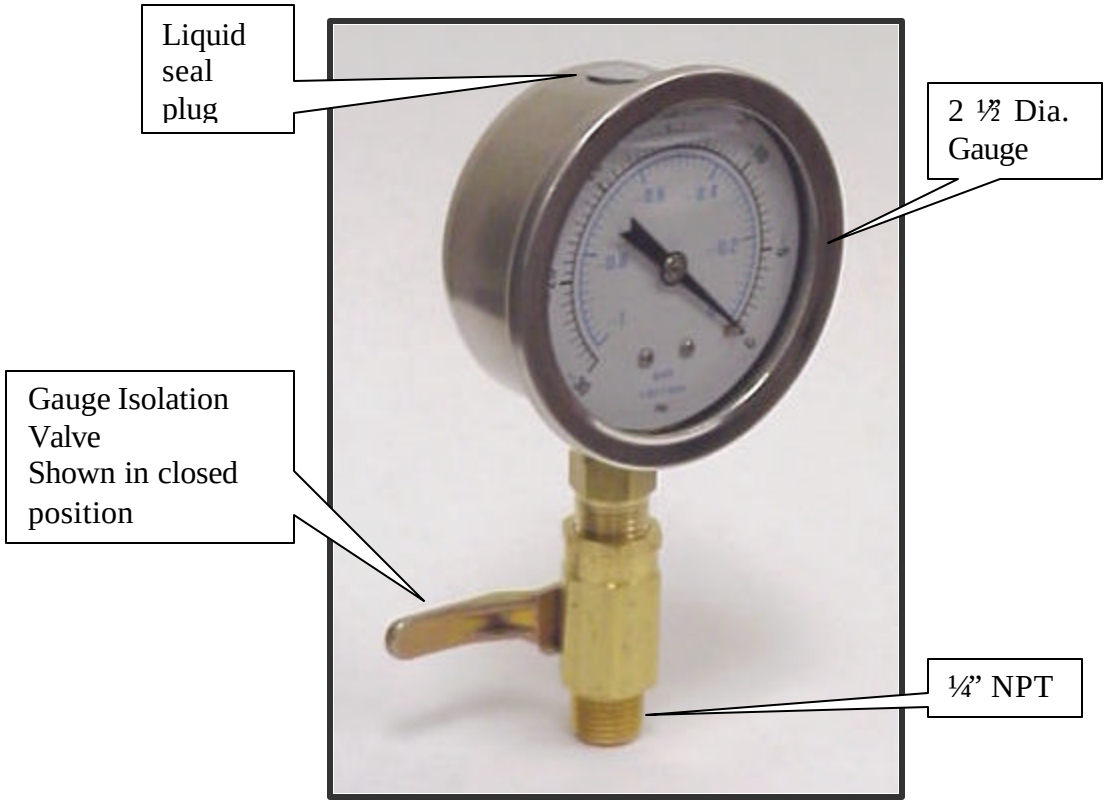
J. E. GASHO & ASSOCIATES, INC.

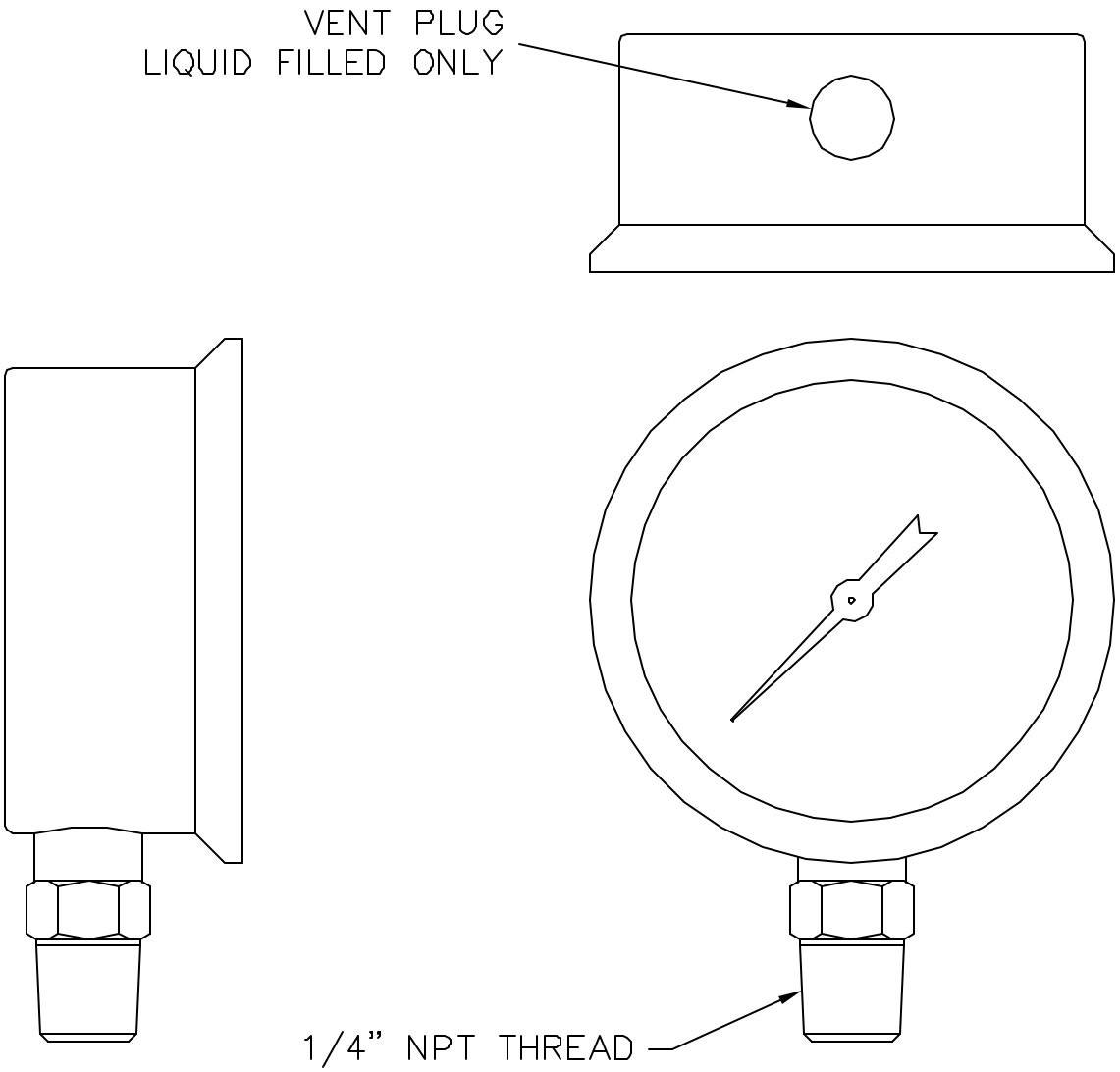
Authorized Manufacturer's Representative
Air / Gas Moving Equipment
460 W. GAY STREET
WEST CHESTER, PA 19380
PHONE: 610-692-5650 FAX: 610-692-5837

Pressure and Vacuum Gauges

We use both standard gauges and liquid filled gauges from a variety of manufacturers. Gauges are installed on our packages with gauge isolation valves (gauge cocks) part number VIS-0.25-FM-B-0000. The gauge isolation valve can be used as a snubber while reading the gauge by opening it slightly. To protect gauges from damage due to shocks or pulsations in the system, gauge isolation valves should be closed except when the gauge is being read.

Liquid filled gauges may display incorrect readings due to variations in atmospheric pressure. To determine if a gauge is subject to this condition, the liquid filled cavity should be temporarily vented to atmosphere. Most liquid filled gauges have a seal plug in the liquid filled cavity. Remove this plug to allow the cavity to be vented to atmosphere. In some instances the case can be lightly squeezed to burp it. Replace the plug.





25.0.015PSI

NOMINAL SIZE
- 25 = 2.5in
- 40 = 4.0 in.

TYPE
- 0 = NON-FILLED
- 1 = LIQUID FILLED

RANGE

NOTES:
1. WE USE BOTH STANDARD GAUGES & LIQUID FILLED GAUGES FROM A VARIETY OF MANUFACTURERS
2. STANDARD RANGES:
   - PRESSURE: 0-6 PSI & 0-160 IWC
     0-15 PSI
     0-30 PSI
   - VACUUM: 0-12 IN. HG. & 0-160 IWC
     0-30 IN., HG.

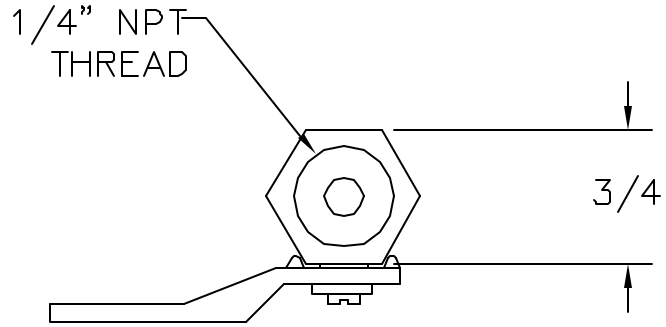
REV.	DATE	DESCRIPTION

DRAWN BY: M. WITTE	DATE 8-18-00
APPROVED BY:	DATE
DIMENSIONS IN INCHES	
SCALE	
TOLERANCE	ANGULAR TOLERANCE
MATERIAL	WEIGHT
SHEET 1 OF 1	

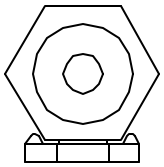
J. E. GASHO & Assoc., Inc.
460 W. GAY ST.
WEST CHESTER, PENNSYLVANIA 19380

PRESSURE GAUGE NUMBERING SYSTEM

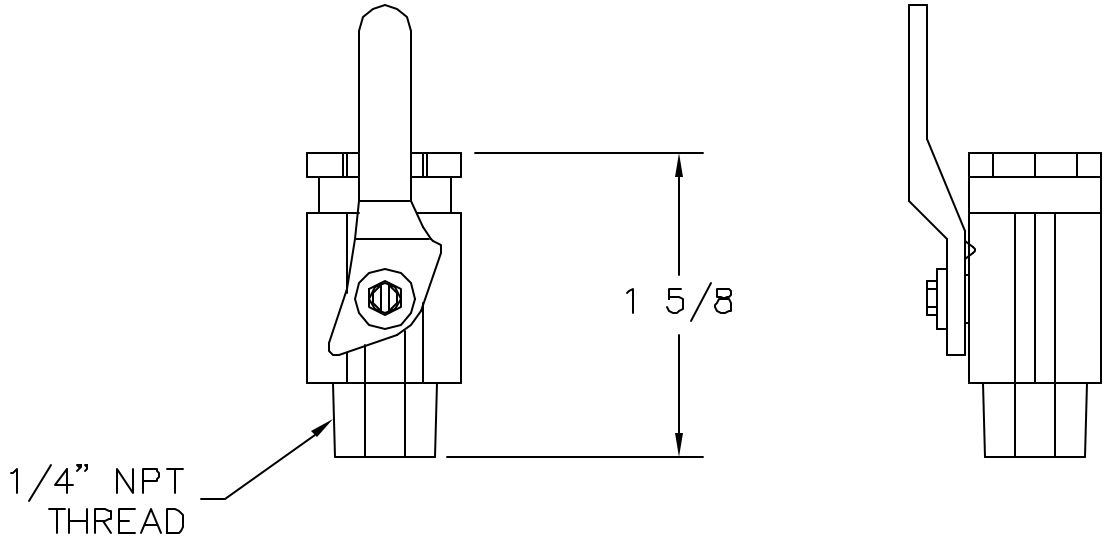
—



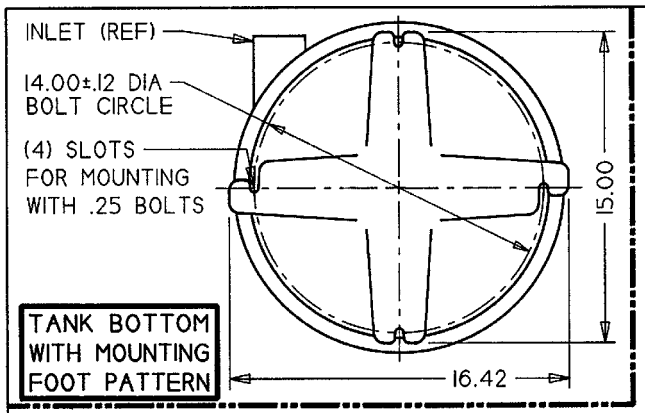
PLAN VIEW – CLOSED

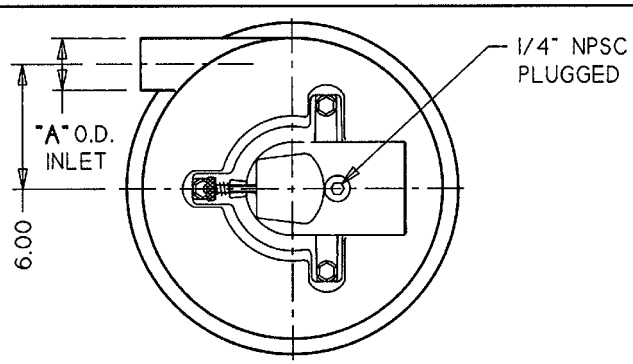


PLAN VIEW – OPEN



			DRAWN BY: M. WITTE	DATE 8–17–00	J. E. GASHO & Assoc., Inc. 460 W. GAY ST. WEST CHESTER, PENNSYLVANIA 19380
			APPROVED BY:	DATE	
			DIMENSIONS IN INCHES		GAUGE ISOLATION VALVE SMC VA BRS 025–4F4M–BT
			SCALE		
			TOLERANCE	ANGULAR TOLERANCE	
			MATERIAL	WEIGHT	
REV.	DATE	DESCRIPTION	SHEET 1 OF 1		—

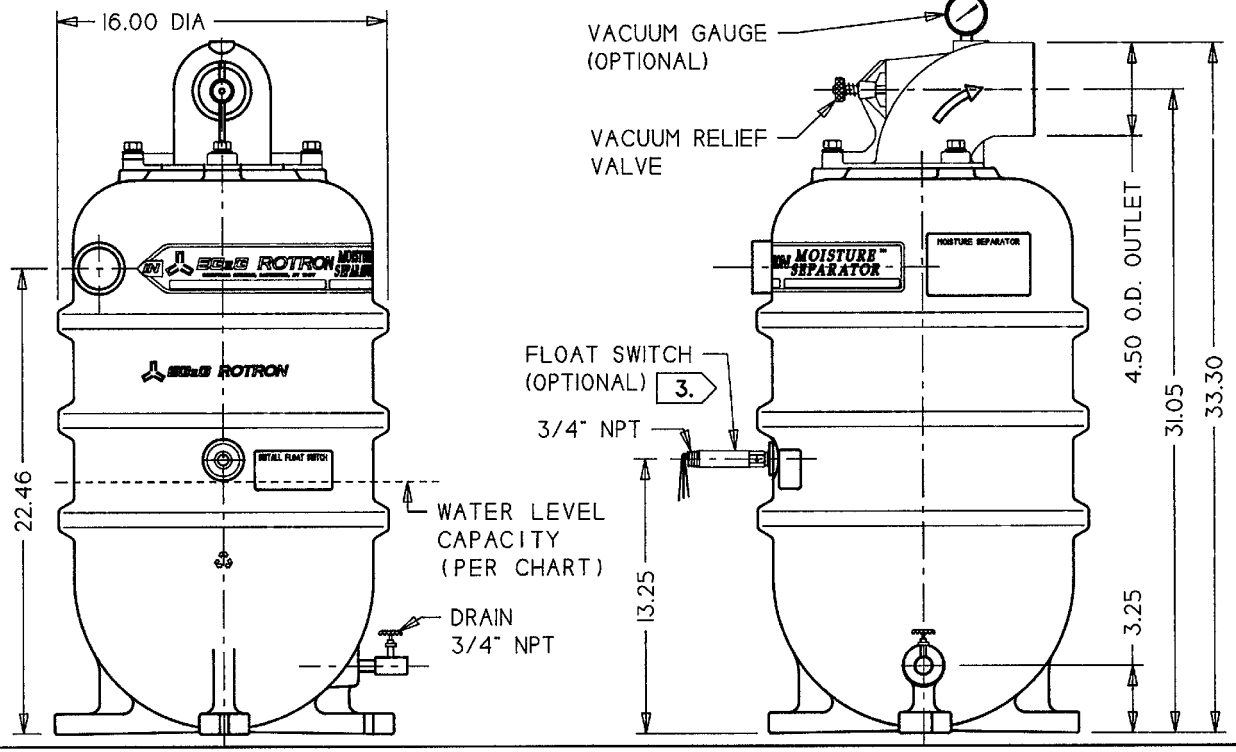




APP.	DATE	C.O. NO.	REV.
JG	6/96	62020	A

NOTES:

1. SEPARATOR INLET AND OUTLET MUST BE CONNECTED TO SYSTEM PIPING WITH A FLEXIBLE COUPLING TO REDUCE STRAIN.
2. FLOAT LEVEL SWITCH: S.P.D.T. IS UL RATED FOR USE IN CLASS I : GROUPS A, B, C, & D. CLASS II : GROUPS E, F, & G. RATED 125/250 VAC. 5 AMPS.
3. INSTALL FLOAT LEVEL SWITCH WITH INDEX ARROW ON SIDE OF SWITCH POINTING DOWN.
4. SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



MODEL	CAPACITY GAL.	CFM MAX.	"A" O.D.
MS200P	7	200	2.38
MS300P	7	300	2.88

DRAFTING STD. PER ROTRON STD. NO.1 UNLESS OTHERWISE SPECIFIED

NO BURRS ALLOWED. INSIDE AND OUTSIDE CORNERS UNLESS SPECIFIED MAY HAVE .010 MAX. BREAK.

TOLERANCE UNLESS SPECIFIED
2 PL.DEC.± .25
3 PL.DEC.± —
ANGULAR± —

EG&G ROTRON
INDUSTRIAL DIV. ROTRON INC. SAUGERTIES, NY 12477

MOISTURE SEPARATOR
HDPE TANK
OUTLINE DRAWING

MATERIAL

SCALE 1/6 | DATE 10/14/93 | DRAWN (NM) | CHECK | APPVD. JG 10/93

MC- 29526

SHEET 1 OF 1

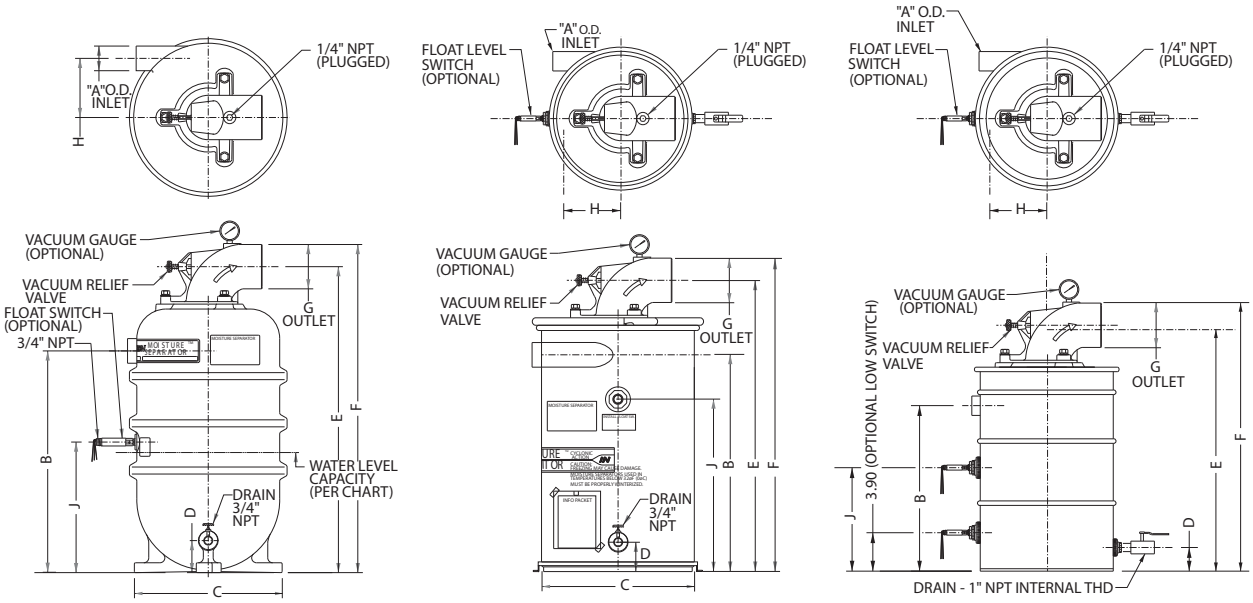
A
REV

Filtration - Moisture Separator

ROTRON®

By separating and containing entrained liquids, ROTRON'S™ moisture separator helps protect our regenerative blowers and the end treatment system from corrosion and mineralization damage. Recommended for all soil vacuum extraction applications.

SPECIFICATIONS:
SEPARATION METHOD – High E ciency Cyclonic
RELIEF VALVE MATERIAL – Brass & Stainless Steel
FLOAT MATERIAL – Copper
FLOAT SWITCH – SPDT, Explosion-proof
NEMA 7&9, 5 Amp max.



PLASTIC "P" DESIGN | METAL "D" DESIGN | METAL "B" DESIGN

Models without oat switch available. Metal MS200/300DS models are not the standard stocked, but are available.

		Part/Model Number							
		MS200PS	MS300PS	MS200DS	MS300DS	MS350BS	MS500BS	MS600BS	MS1000BS
Specification	Units	038519	038520	080086	080087	038357	080660	080659	038914
Dimension A	Inches	2.38	2.88	2.00	2.50	3.25	3.25	4.00	6.00
	mm	60.5	73.2	50.8	63.5	82.6	82.6	101.6	152.4
CFM Max.	CFM	200	300	200	300	350	500	600	1000
	m3/hr	340	510	340	510	595	850	1020	1700
Dimension B	Inches	22.46	22.46	22.12	22.12	28.00	28.00	27.00	31.00
	mm	570.5	570.5	561.8	561.8	711.2	711.2	685.8	787.4
Dimension C	Inches	16.00	16.00	16.75	16.75	23.00	23.00	23.00	27.00
	mm	406.4	406.4	425.5	425.5	584.2	584.2	584.2	685.8
Dimension D	Inches	3.25	3.25	2.75	2.75	4.00	4.00	4.00	4.00
	mm	82.6	82.6	69.9	69.9	101.6	101.6	101.6	101.6
Dimension E	Inches	31.05	31.05	27.92	27.92	37.25	37.37	37.37	47.32
	mm	788.7	788.7	709.2	709.2	946.2	949.2	949.2	1201.9
Dimension F	Inches	33.30	33.30	30.17	30.17	39.50	54.50	54.50	51.70
	mm	845.8	845.8	766.3	766.3	1003.3	1384.3	1384.3	1313.2
Dimension H	Inches	6	6.00	6.56	6.81	9.75	9.75	9.25	10.00
	mm	152.4	152.4	166.6	173	247.7	247.7	235	254
Dimension G	Inches	4.50 OD	4.50 D	4.50 D	4.50 OD	4.50 OD	6.63 ID	6.63 ID	8.62 OD
	mm	114.3	114.3	114.3	114.3	114.3	168.4	168.4	218.9
Dimension J	Inches	13.25	13.25	12.62	12.62	17.50	17.50	17.50	19.88
	mm	336.6	336.6	320.5	320.5	444.5	444.5	444.5	505
Drain Internal Thd	-	3/4	3/4	3/4	3/4	1	1	1	1
Shipping Weight	Lbs	42	42	42	42	82	95	96	150
	Kg	19.1	19.1	19.1	19.1	37.2	43.1	43.5	68

This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The performance data on this page depicts typical performance under controlled laboratory conditions. AMETEK is not responsible for blowers driven beyond factory specified speed, temperature, pressure, flow or without proper alignment. Actual performance will vary depending on the operating environment and application. AMETEK products are not designed for and should not be used in medical life support applications. AMETEK reserves the right to revise its products without notification. The above characteristics represent standard products. For product designed to meet specific applications, contact AMETEK Technical & Industrial Products Sales department.

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9664 - Asia: +86 21 5763 1258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

2.0 Moisture Separator™ Specifications

2.1 Duty

The moisture separator shall be designed for use in a soil vapor extraction system capable of continuous operation with a pressure drop of less than six inches of water at the rated flow of _____ SCFM. The separator shall be capable of operation under various inlet conditions randing from a fine mist to slugs of water with high efficiency.

2.2 Principle of Operation

The moisture separator shall incorporate cyclonic separation to remove entrained water. The separator must protect against an overflow by fail safe mechanical means. An electrical switch or contact(s) alone is not an acceptable means of protection against overflow, but is a good backup.

2.3 Construction

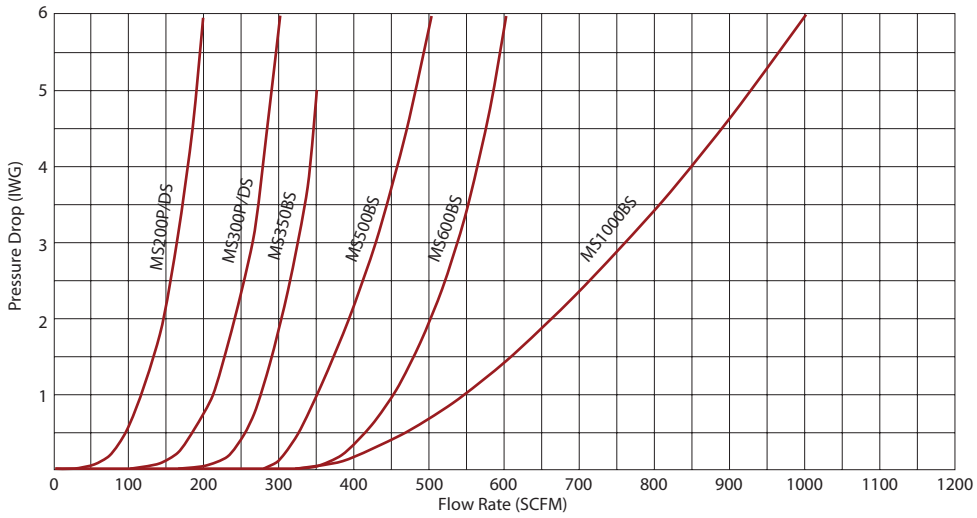
The body of the moisture separator shall be constructed of heavy wall plastic or heavy gauge cold rolled steel. The steel interior and exterior shall be epoxy (powder) coated to resist abrasion, corrosion, and chipping that might expose the surface. The inlet shall be tangentially located and welded to the body. The outlet port shall be constructed of PVC or cast aluminum alloy, flanged and sealed to the center of the top of the separator. The separator shall incorporate a non-sparking copper float ball and an adjustable relief valve to protect against overflow and overheating the blower.

2.4 Capacity and Dimension

The moisture separator must have a liquid capacity of _____ gallons. The inlet shall be _____ inch OD slip-on type. The outlet shall be _____ inch OD slip-on type.

For DR/EN/CP Blower Model	Selector Moisture Separator Model	Liquid-holding Capacity (gallons)	Inlet (OD)	Outlet	Max Vacuum Allow (IHG)
404 454 505 513	MS200PS	7	2.38		12
523 555 633 833	MS200DS	10	2.0	4.5 OD	22
656 6 757	MS300PS	7	2.88		12
	MS300DS	10	2.5		22
808	MS350BS	40	3.25	6.63 ID	
858 1233	MS500BS				
909	MS600BS		4.0		
979 14	MS1000BS	65	6.0	8.62 OD	

2.5 Pressure Drop



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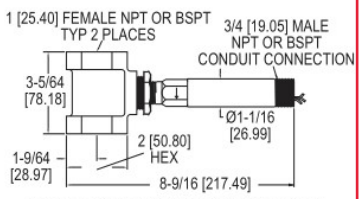
www.ametektip.com

Dwyer

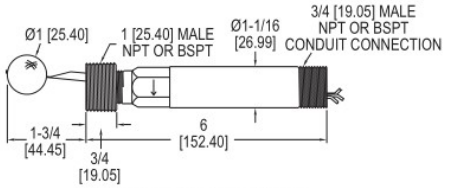
SERIES L6 | W.E. ANDERSON™ BY DWYER

FLOTECT® LIQUID LEVEL SWITCHES

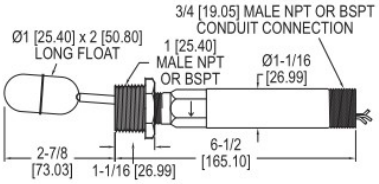
Easy In-wall or External Installation, Up to 2000 psig (138 bar), Compact Size



Model L6 with external float chamber



Model L6 with spherical float



Model L6 with cylindrical float

The **Series L6 Flotect® Liquid Level Switches** are rugged and reliable float switches which operates automatically to indicate tank level. It is offered with a 303 SS or brass body with spherical or cylindrical float options.

FEATURES/BENEFITS

- Compact design is built for years of trouble-free service
- Simple and dependable operation with no mechanical linkage
- Float lever pivoted within the body moves when the process liquid displaces the float and magnet on the opposite end of the float lever controls a second magnet on the switch actuating lever located in the switch housing
- Leak proof lower body machined from bar stock
- Side wall or direct tee mounting options available to act as an external float chamber
- Weatherproof and explosion-proof body for demanding outdoor applications
- Electrical assembly can be easily replaced without removing the unit from the installation so that the process does not have to be shut down
- Sensitive to level changes of less than 1/2″ (12 mm)

APPLICATIONS

- Direct pump control for maintaining level
- Automatic tank dump operations
- Level control
- Valve control
- Level alarm in sumps, scrubber systems, hydro-pneumatic tanks, boilers, and water/wastewater treatment processes

OPTIONS

To order add suffix:	Description
-MV	Gold plated contacts for dry circuits (see electrical rating in specifications)
-MT	High temperature rated 400°F (204°C) (see electrical rating in specifications, no listings or approvals, only available on models with stainless steel floats)
-CSA	CSA and UL approved construction, includes weatherproof and explosion-proof junction box
-AT	ATEX compliant construction includes, weatherproof and explosion-proof, junction box
-IEC	IECEx certified construction, weatherproof and explosion-proof, junction box

Note: M25 is not available with the CSA housing.

DPDT Contacts

Note: To order, change seventh character in model number to "D".
Example: L6EPB-B-D-3-O

Options Not Shown: 1-1/2″ and 2″ (38.10 and 50.80 mm) male NPT or 1-1/2″ and 2″ (38.10 and 50.80 mm) male BSPT process connection, 2″ female NPT or 2″ female BSPT.

SPECIFICATIONS

Service: Liquids compatible with wetted materials.
Wetted Materials: Float: Solid polypropylene or 304 SS; Lower body: Brass or 303 SS; Magnet: Ceramic; External float chamber (tee): Matches lower body choice of brass or 303 SS; Other: Lever arm, spring, pin, etc.: 301 SS.
Temperature Limit: -4 to 220°F (-20 to 105°C) Standard, MT high temperature option 400°F (205°C)(MT not UL, CSA, ATEX, IECEx and KC). ATEX compliant AT, IECEx IEC and KC option ambient temperature -4 to 167°F (-20 to 75°C) process temperature: -4 to 220°F (-20 to 105°C).
Pressure Limits: See model chart.
Enclosure Rating: Weatherproof and Explosion-proof. Listed with UL and CSA for Class I, Groups A, B, C and D; Class II, Groups E, F, and G. (Group A on stainless steel body models only).
ATEX CE 0344 Ex II 2 G Ex d IIC T6 Gb Process Temps≤75°C.
EC-Type Certificate No.: KEMA 04ATEX2128.
ATEX Standards: EN 60079-0: 2009; EN60079-1: 2007.
IECEx Certified: For Ex d IIC T6 Gb Process Temps≤ 75°C.
IECEx Certificate of Conformity: IECEx DEK II.0039.
IECEx Standards: IEC 60079-00: 2007; IEC 60079-1: 2007.
Korean Certified (KC) for Ex d IIC T6 Gb Process Temps≤75°C.
KTL Certificate Number: 2012-2454-75.
Switch Type: SPDT snap switch standard, DPDT snap switch optional.
Electrical Rating: UL models: 5 A @ 125/250 VAC (V~). CSA, ATEX and IECEx models: 5 A @ 125/250 VAC (V~); 5 A res., 3 A ind. @ 30 VDC (V⎓). MV option: .1 A @ 125 VAC (V~). MT option: 5 A @125/250 VAC (V~). [MT option not UL, CSA, ATEX or IECEx].
Electrical Connections: UL models: 18 AWG, 18″ (457.20 mm) long. ATEX/CSA/IECEx models: terminal block.
Upper Body: Brass or 303 SS.
Conduit Connection: 3/4″ (19.05 mm) male NPT standard, 3/4″ (19.05) female NPT or M25 with BSPT option on junction box models.
Process Connection: 1″ (25.40 mm) male NPT or 1″ (25.40 mm) male BSPT on models without external float chamber, 1″ (25.40 mm) female NPT or 1″ (25.40 mm) female BSPT on models with external float chamber.
Mounting Orientation: Horizontal with index arrow pointing down.
Specific Gravity: See chart.
Weight: Approximately 1 lb (.5 kg) without external float chamber, 1.75 lb (.8 kg) with external float chamber.
Agency Approvals: ATEX, CE, CSA, IECEx, KTL, UL.

MODEL CHART

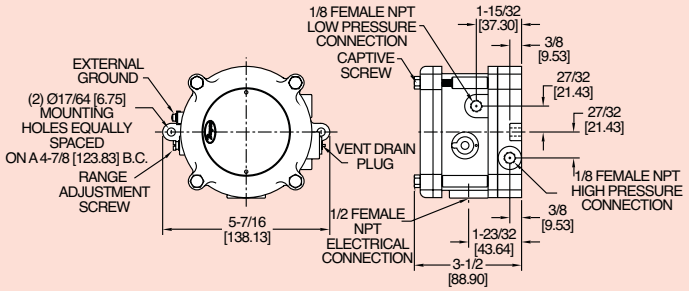
Model	Body	Installation	Float Material	Process Connection	Max. Pressure psig (bar)	Min. S.G.
L6EPB-B-S-3-O	Brass	Side wall mounting	Polypropylene spherical	NPT	1000 (69)	0.9
L6EPB-B-S-3-A	Brass	Side wall mounting	304 SS cylindrical	NPT	200 (13.8)	0.5
L6EPB-B-S-3-C	Brass	Side wall mounting	304 SS spherical	NPT	350 (24.1)	0.7
L6EPB-B-S-3-B	Brass	Brass external float chamber (tee)	Polypropylene spherical	NPT	250 (17.2)	0.9
L6EPB-B-S-3-H	Brass	Brass external float chamber (tee)	304 SS spherical	NPT	250 (17.2)	0.7
L6EPS-S-S-3-O	303 SS	Side wall mounting	Polypropylene spherical	NPT	2000 (138)	0.9
L6EPS-S-S-3-A	303 SS	Side wall mounting	304 SS cylindrical	NPT	200 (13.8)	0.5
L6EPS-S-S-3-C	303 SS	Side wall mounting	304 SS spherical	NPT	350 (24.1)	0.7
L6EPS-S-S-3-S	303 SS	304 SS external float chamber (tee)	Polypropylene spherical	NPT	2000 (138)	0.9
L6EPS-S-S-3-L	303 SS	304 SS external float chamber (tee)	304 SS spherical	NPT	350 (24.1)	0.7

BSPT process connection and M25 conduit connection. **Note:** To order, change eighth character in model to "4". **Example:** L6EPB-B-S-4-A

USA: California Proposition 65
⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Series 1950 Explosion-proof Differential Pressure Switches

Compact, Low Cost, Explosion-proof and Weatherproof



Model 1950 Explosion-Proof Differential Pressure Switch combines the best features of the popular Dwyer® Series 1900 Pressure Switch with an integral explosion-proof and weatherproof housing, making it an exceptional value for either application. It is CE, UL and CSA listed, FM approved for use in Class I, Div 1, Groups C and D, Class II Groups E, F, and G and Class III hazardous atmospheres (NEMA 7 & 9), Raintight (NEMA 3). Weatherproof features include a drain plug and O-ring seal in cover. Electrical connections are easily made by removing front cover. For convenience the set point adjustment screw is located on the outside of the housing. Twelve models offer set points from .03 to 20˝ w.c. (7.5 to 5 kPa) and from .5 to 50 psi (0.035 to 3.5 bar). The unit is very light and compact – about half the weight and bulk of other explosion-proof or weather-proof switches with separate enclosures.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Temperature Limits: -40 to 140°F (-40 to 60°C); 0 to 140°F (-17.8 to 60°C) for 1950P-8, 15, 25, and 50. -30 to 130°F (-34.4 to 54.4°C) for 1950-02.
Pressure Limits:
Continuous: 1950's - 45˝ w.c. (0.11 bar); 1950P's - 35 psi (2.41 bar); 1950P-50 only - 70 psi (4.83 bar).
Surge: 1950's - 10 psi (0.69 bar), 1950P's - 50 psi (3.45 bar), 1950P-50 only - 90 psi (6.21 bar).
Enclosure Rating: IP64, NEMA 3, 7 and 9.
Switch Type: Single-pole double-throw (SPDT).
Electrical Rating: 15 A @, 125, 250, 480 VAC, 60 Hz. Resistive 1/8 HP @ 125 VAC, 1/4 HP @ 250 VAC, 60 Hz.
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 on top of housing.
Weight: 3.25 lb (1.5 kg); 1950-02 model, 4.4 lb (2 kg).
Agency Approvals: CE, UL, CSA, FM.

SERIES 1950 SWITCHES - MODELS, OPERATING RANGES AND DEAD BANDS

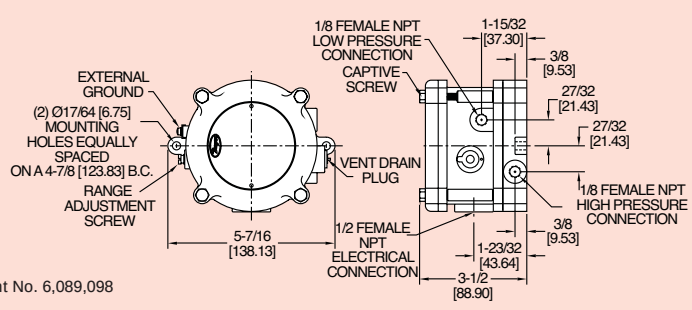
Model Number	Range, Inches W.C.	Approximate Dead Band at	
		Min. Set Point	Max. Set Point
1950-02-2S	.03 to .10	.025	.05
1950-00-2F	.07 to .15	.04	.05
1950-0-2F	.15 to .50	.10	.15
1950-1-2F	.4 to 1.6	.15	.20
1950-5-2F	1.4 to 5.5	.30	.40
1950-10-2F	3 to 11	.40	.50
1950-20-2F	4 to 20	.40	.60

Model* Number	Range, PSID	Approximate Dead Band at	
		Min. Set Point	Max. Set Point
1950P-2-2F	0.5 to 2	.3	.3
1950P-8-2F	1.5 to 8	1.0	1.0
1950P-15-2F	3 to 15	.9	.9
1950P-25-2F	4 to 25	.7	.7
1950P-50-2F	15 to 50	1.0	1.5

CAUTION: For use only with air or compatible gases. Applications with hazardous atmospheres and a single positive pressure may require special venting.
*P=PSID range models

Series 1950G Explosion-proof Differential Pressure Switch

Explosion-proof, Weatherproof, Compatible with Natural Gases



Patent No. 6,089,098

The Model 1950G Explosion-Proof Switch combines the best features of the popular Dwyer® Series 1950 Pressure Switch with the benefit of natural gas compatibility. Units are rain-tight for outdoor installations, and are UL listed for use in Class I, Groups A, B, C, & D; Class II, Groups E, F, & G and Class III atmospheres, Directive 94/9/EC (ATEX) Compliant for CE Ex II 2 G EExd IIB & Hydrogen T6 and CSA & FM approved for Class I, Div 1, Groups B, C, D; Class II, Div 1, Groups E, F, G and Class III atmospheres. The 1950G is very compact, about half the weight and bulk of equivalent conventional explosion-proof switches.
Easy access to the SPDT relay and power supply terminals is provided by removing the top plate of the aluminum housing. A supply voltage of 24 VDC, 120 or 240 VAC is required. A captive screw allows the cover to swing aside while remaining attached to the unit. Adjustment to the set point of the switch can be made without disassembly of the housing.

SPECIFICATIONS

Service: Air and compatible combustible gases.
Wetted Materials: Contact Factory.
Temperature Limits: 0 to 140°F (-17 to 60°C). Note: Set point drift may occur with ambient temperature changes.
Pressure Limits: 45˝ w.c. (11.2 kPa) continuous; 10 psig (68.95 kPa) surge.
Enclosure Rating: IP64, NEMA 3, 7 and 9.
Switch Type: 1 Form C relay (SPDT).
Electrical Rating: 10A, 120/240 VAC, 28 VDC. Resistive 50mA, 125 VDC.
Power Requirements: 24 VDC ±10%. 120 or 240 VAC ±10% optional.
Electrical Connections: Internal terminal block.
Process Connections: 1/8˝ female NPT.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Set Point Adjustment: Screw type on top of housing.
Weight: 2 lb, 15.7 oz (1.35 kg).
Agency Approvals: CE, UL, CSA, FM, ATEX.

MODELS

Model Number[1]	Range, Inches W.C.	Approximate Dead Band at	
		Min. Set Point	Max. Set Point
1950G-00-B-24-NA	.07 to .15	.04	.06
1950G-0-B-24-NA	.15 to .50	.06	.11
1950G-1-B-24-NA	.4 to 1.6	.11	.29
1950G-5-B-24-NA	1.4 to 5.5	.4	.9
1950G-10-B-24-NA	3 to 11	.9	1.8
1950G-20-B-24-NA	4 to 20	1.2	3.0

[1]Note: For alternate supply voltages change 24 to 120 or 240. Example: 1950G-00-B-120. For ATEX approved models remove"-NA".

Enclosure Specification
Modular System

501 South Main Street
Spring City, PA 19475
1-800-962-0670

▪Enclosure shall be designed to fit just around the equipment to keep cost down. A 4" clearance is the standard dimension provided between the enclosure and the equipment on all sides and the top.

▪Each sound enclosure should be factory assembled and skidded or shipped knocked down. The enclosure shall be designed to incorporate: forced air ventilation with acoustically treated air intake and exhaust. Fan will be sized to maintain a temperature outside/inside variation no greater than 15°F.

▪The enclosure frame shall be made of a heavy-duty aluminum square-tubing frame that allows each wall and roof panel to be removable. A three directional slip fit aluminum corner fitting piece shall be provided at each of the eight corners to connect all aluminum frame pieces together.

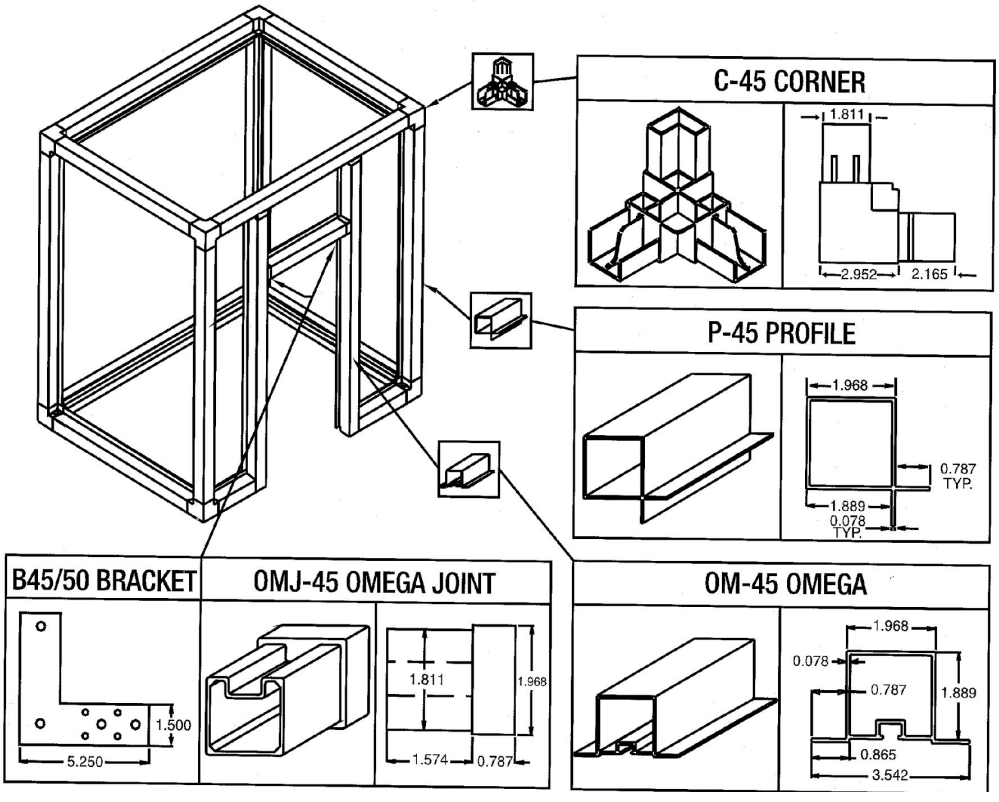
▪Acoustic panels shall have 18 gauge aluminized steel channel provided for bottom caps, top caps, and openings.

▪Acoustic panels:
- ▪Wall and roof panels shall have exterior skin of 18-gauge aluminized steel. Skin shall be 2.5#/ft^2
- ▪2" absorption material, sound absorbing embossed densified polyurethane foam.

▪All doors will be provided with acoustic seals on all four sides with stainless steel or nylon handles and hinges.

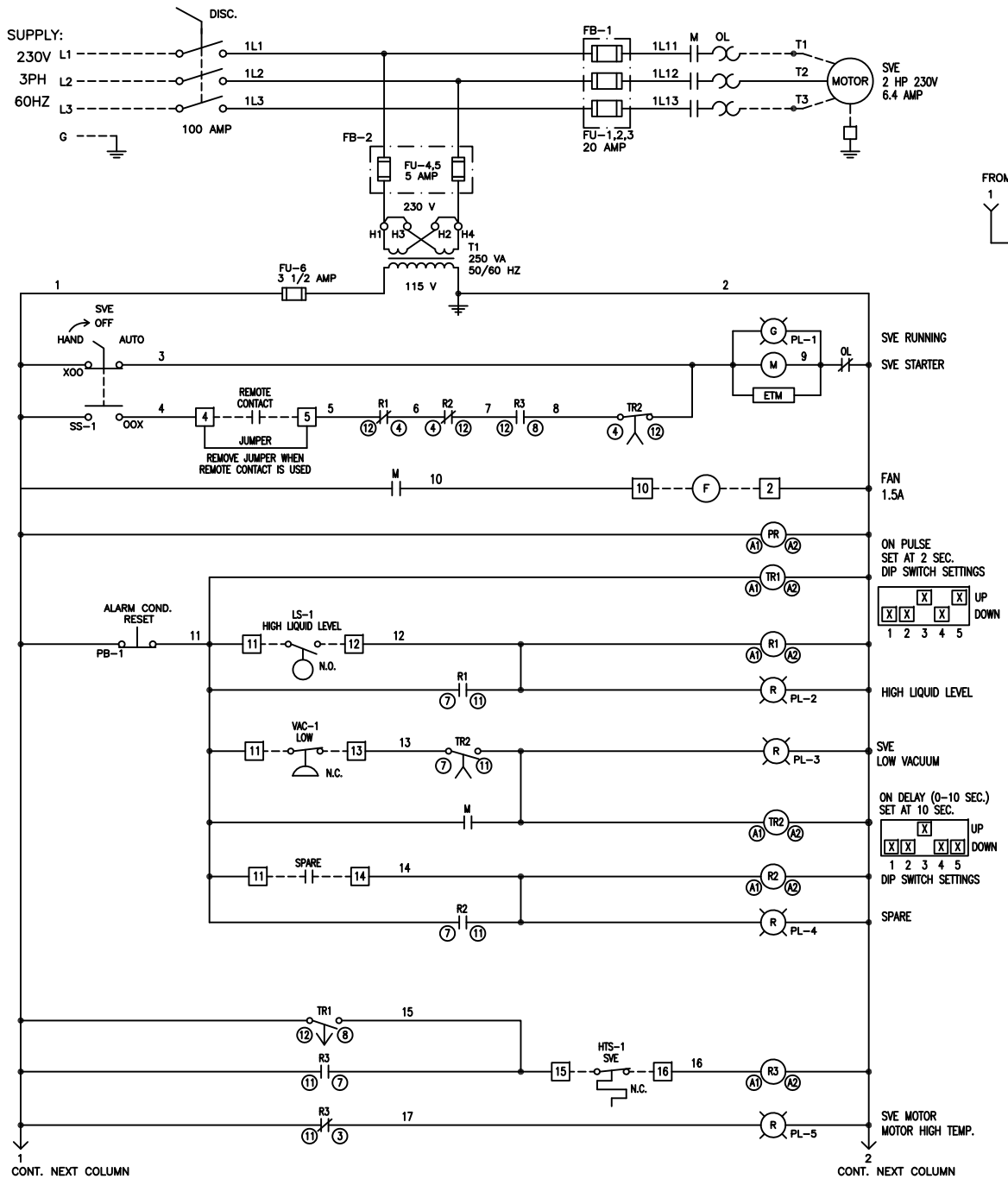
▪All side panels to be easily removable via a quick release clamp.

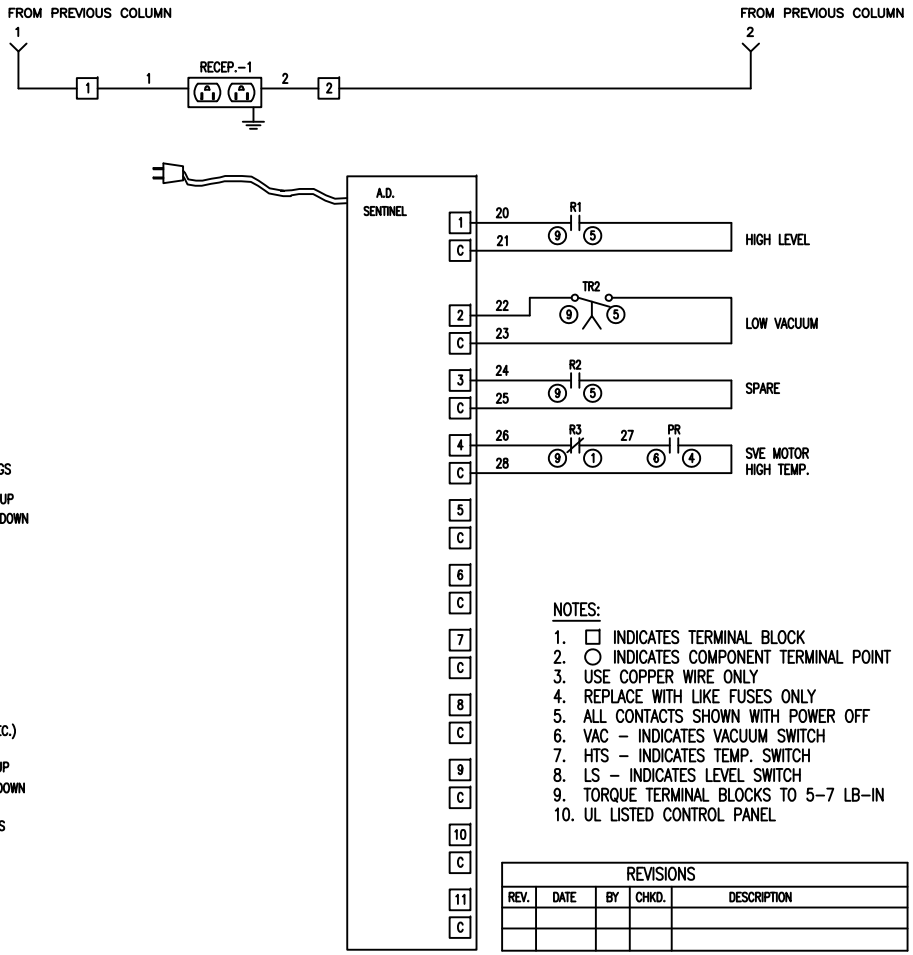
▪Panel acoustical performances have been tested by an independent laboratory and achieve a NRC = 1.0. Expected 20-25 dba reduction when measured at 1 meter in a free field.



See a complete listing of our noise reduction products online at www.ramequipment.com

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF
DELIVERING NOT MORE THAN 5Ka RMS
SYMMETRICAL AMPERES, 240V AC VOLTS MAXIMUM





NOTES:

1. □ INDICATES TERMINAL BLOCK
2. ○ INDICATES COMPONENT TERMINAL POINT
3. USE COPPER WIRE ONLY
4. REPLACE WITH LIKE FUSES ONLY
5. ALL CONTACTS SHOWN WITH POWER OFF
6. VAC – INDICATES VACUUM SWITCH
7. HTS – INDICATES TEMP. SWITCH
8. LS – INDICATES LEVEL SWITCH
9. TORQUE TERMINAL BLOCKS TO 5-7 LB-IN
10. UL LISTED CONTROL PANEL

REVISIONS				
REV.	DATE	BY	CHKD.	DESCRIPTION

J.E. GASHO & ASSOCIATES
PO# 85676-3455

APPROX. WEIGHT: 100 LB'S

HP 2

VOLTAGE 230

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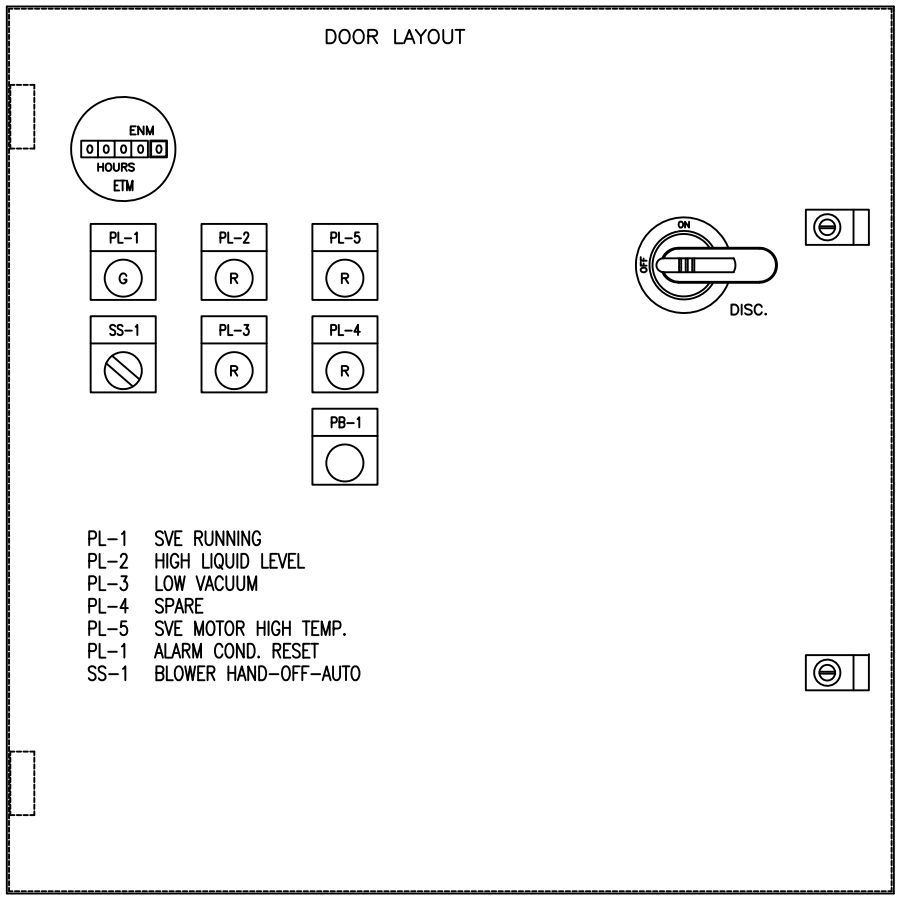
TITLE
BLOWER CONTROL PANEL

DATE	PAGE	DWG NO.	
6/22/20	1 OF 2	GASH252	INTERNATIONAL CONTROL PRODUCTS, INC.

DOOR LAYOUT



PL-1 SVE RUNNING
PL-2 HIGH LIQUID LEVEL
PL-3 LOW VACUUM
PL-4 SPARE
PL-5 SVE MOTOR HIGH TEMP.
PL-1 ALARM COND. RESET
SS-1 BLOWER HAND-OFF-AUTO

BILL OF MATERIALS

ITEM	QTY	ITEM LABEL	MFG.	DESCRIPTION	PART NUMBER
1	1	ENCL	RITTAL	24x24x8 NEMA 4 ENCLOSURE	AE1060.500
2	2	ENCL	RITTAL	SCREWDRIVER INSERT	SZ2464
3	1	DISC.	ABB	100A 3P NON-FUSED DISC. SWITCH	OT100F3
4	1	DISC.	ABB	NEMA 4 DISCONNECT HANDLE	OHB65L6
5	1	DISC.	ABB	DISCONNECT SHAFT	OXP6X210
6	1	FB-1	MERSEN	3P 30A CLASS CC FUSE BLOCK	30323R
7	3	FU1,2,3	MERSEN	20 AMP CLASS CC FUSE	AJT20
8	1	M	SIEMENS	9 AMP IEC CONTACTOR	3RT2016-1AK61
9	1	M	SIEMENS	1 N.O. AUX. CONTACT	3RH2911-1AA10
10	1	OL	SIEMENS	OVERLOAD RELAY (5.5-8 FLA)	3RU2116-1HB0
11	1	SS-1	ABB	3 POS. S.S. SPRG. RET. L TO C (2 N.O.)	M3SS7-30B-20
12	1	PL-1	ABB	GREEN F.V. PILOT LIGHT - 120V	CL-100G
13	4	PL-2,3,4,5	ABB	RED F.V. PILOT LIGHT - 120V	CL-100R
14	1	PB-1	ABB	BLACK FLUSH P.B. (1 N.C.)	MP1-30B-01
15	1	ETM	ENM	ELAPSED TIME METER	T50B2-12
16	1	T1	SIEMENS	250VA CONTROL TRANSFORMER	MT0250A
17	1	FB-2	MERSEN	2P 30A CLASS CC FUSE BLOCK	30322R
18	2	FU-4,5	MERSEN	5 AMP CLASS CC FUSE	ATDR5
19	1	FU-6	MERSEN	3 1/2 AMP TIME DELAY FUSE	TRM3 1/2
20	1	PR	FINDER	2 POLE RELAY - 120V	55.34.8.120.0040
21	1	PR	FINDER	2 POLE RELAY SOCKET	94.74
22	3	R1,R2,R3	FINDER	4 POLE RELAY - 120V	55.34.8.120.0040
23	3	R1,R2,R3	FINDER	4 POLE RELAY SOCKET	94.74
24	1	TR1	FINDER	2 POLE TIMER - 120V	85.02.0.125.0000
25	1	TR1	FINDER	2 POLE TIMER SOCKET	94.82
26	1	TR2	FINDER	4 POLE TIMER - 120V	85.04.0.125.0000
27	1	TR2	FINDER	4 POLE TIMER SOCKET	94.74
28	1	A.D.	SENSAPHONE	SENTINEL CELLULAR MONITORING SYSTEM	SCD-1200-4G__SD
29	1	RECEPT.	COMMERCIAL ELECTRIC	1 GANG BOX	WSB350G
30	1	RECEPT.	GFCI	GFCI RECEPTACLE	TGMT20
31	16	T.B.'S	PHOENIX	TERMINAL BLOCK	3004362
32	1	T.B.'S	PHOENIX	TERMINAL BLOCK END COVER	3003020
33	2	T.B.'S	PHOENIX	DIN RAIL END RETAINER	0800886
34	2	GROUND	BURNDY	14-2 AWG GROUND LUG	DLA2
35					

REVISIONS				
REV.	DATE	BY	CHKD.	DESCRIPTION

J.E. GASHO & ASSOCIATES
PO# 85676-3455

APPROX. WEIGHT: 100 LB'S

HP 2

VOLTAGE 230

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TITLE: BLOWER CONTROL PANEL

DATE	PAGE	DWG NO.	
6/22/20	2 OF 2	GASH252	INTERNATIONAL CONTROL PRODUCTS, INC.

SENSAPHONE®
REMOTE MONITORING SOLUTIONS

Sensaphone Sentinel with Cellular Modem
Technical Specifications

ALARM NOTIFICATION METHODS:

E-Mail, Text Messages, Voice Phone Calls

Programmable alarm escalation levels

Comprehensive scheduling per input, profile, and alarm destination

Unlimited number of User Profiles

Multiple contact types per user

INPUTS:

12 Universal Inputs

- Normally Open / Normally Closed Dry Contact
- 2.8K / 10K Thermistor
- 4-20mA Current Loop
- Pulse Count
- 12 Bit Resolution

TEMPERATURE SENSING RANGE:

-109° to 168°F | -85° to 76°C

RELAY OUTPUT:

Programmable. Rated for 1A 30VAC/ 1A 30VDC

DATA LOGGING:

Unlimited samples securely stored on the Sentinel servers

Programmable sampling Interval - 1 min to 24 hrs

User programmable channel selection

CELLULAR COMMUNICATION:

3G or 4G Cellular Modem for use on Verizon, AT&T or Rogers

BATTERY BACKUP:

4.8V 2000mAHr NiMh Battery pack (included)

12V 3000 mAHR SLA Battery (included)

Provides 8 hours of backup

LOCAL INDICATORS:

12 Alarm Status LEDs

- Power LED • Online LED
- Standby LED • Ethernet link and Activity LEDs

POWER REQUIREMENTS:

Power Requirement: 12-24DC

- Comes with 12VDC plug-in power supply
- International power options available

Current Draw: 300mA at 24VDC

ENVIRONMENTAL:

Operating Humidity:
0-90% RH, non–condensing

Operating Temperature:
32° to 122°F | 0° to 50°C

PHYSICAL:

Dimensions:
12.5 x 12.2 x 7.0” | 318 x 310 x 178mm

Weight: 10.5 lbs. | 4.7 kg

STANDARDS:

FCC Part 15 – Class A Compliant

ENCLOSURE:

NEMA-4 rated plastic housing

Continued on back

ANTENNA:

2G/3G/4G Frequencies: 698-960/1710-2700MHz

Peak gain: 5dBi

Pattern: Omni-directional

Height: 6.45” (164mm)

Diameter: 1.90” (48mm)

IP Rating: IP-66

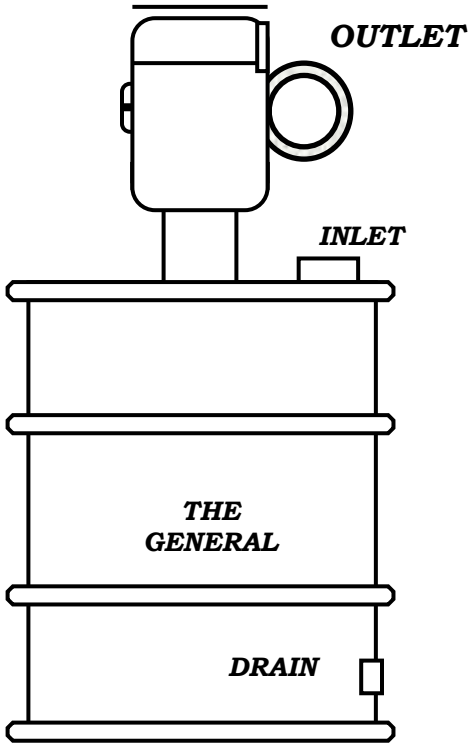
GENERAL CARBON CORP.

F - SERIES

vapor adsorber and fan a simple air pollution solution

GENERAL CARBON CORP, has added a fan to their user friendly Air Pollution Control Barrels to provide a quick and easy solution for simple VOC and odor control applications. The high volume aluminum fan mounted on the top of the General provides efficient control of minor point source pollution problems.

The **F-SERIES** units are available in three sizes that cover a wide range of airflow requirements. The F-55 is our basic unit and will move 125 CFM of air at 4" WC static pressure. The motor is 115/230 VAC, 1 Ph, 60 Hz, TEFC and is weather proof. Wiring of the motor is not included to provide adaptability to site requirements. Loading the unit with impregnated carbon can improve the removal efficiency for Hydrogen Sulfide, Mercaptans, ammonia, formaldehyde, or other problem contaminants.



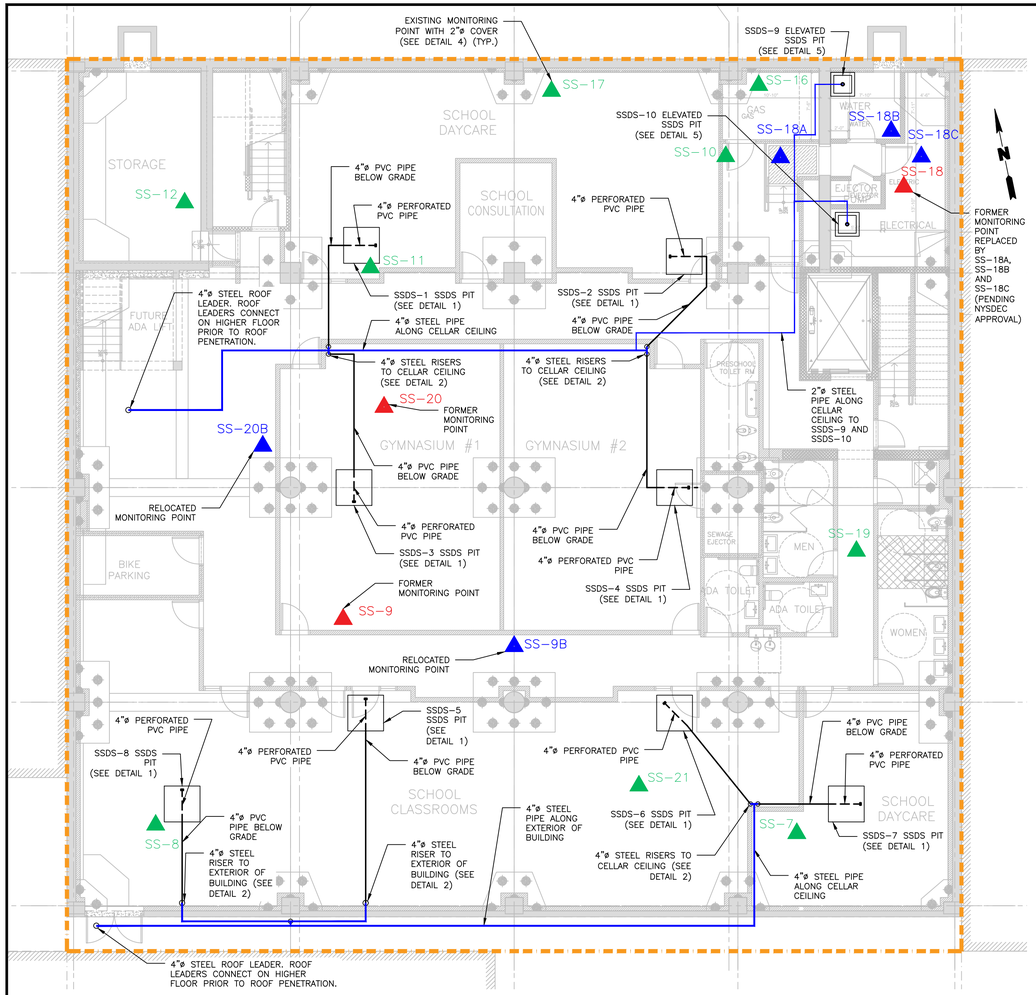
UNIT	DRUM SIZE	LBS. CARBON	FLOW RATE	INLET	OUTLET
F-55	55 Gallon	150	75-125 CFM	4" FPT	4"
F-85	85 Gallon	300	100-210 CFM	4" FPT	4"
F-110	110 Gallon	400	120-350 CFM	4" FPT	5"

AVAILABLE OPTIONS: Special Application Carbons, Polyethylene Drum Liners, Damper, OSHA Safety Guards, Custom Inlet/Outlet Sizes, Full Selection of NEMA Rated Motors, Corrosion Resistant FRP Fans, Remote Mounted Fans, and more...

33 Paterson Street Paterson, NJ 07501 Tel: 973-523-2223 Fax: 973-523-1494
www.generalcarbon.com sales@generalcarbon.com

PLATES

1. Sub-Slab Depressurization System Layout



CELLAR FLOOR SITE PLAN

SCALE: 1/8" = 1'

LEGEND

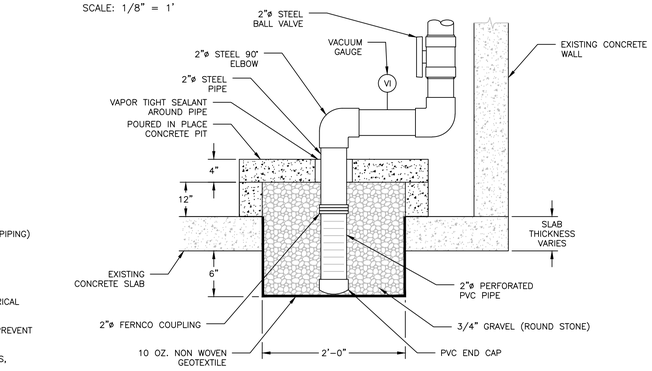
- SS-8 SOIL VAPOR MONITORING POINT
- SS-9 FORMER SOIL VAPOR MONITORING POINT
- SS-9B RELOCATED SOIL VAPOR MONITORING POINT
- 4"ø PERFORATED PVC PIPE BELOW GRADE
- 4"ø PVC PIPE BELOW GRADE
- 4"ø STEEL PIPE ALONG CELLAR CEILING
- 2"ø STEEL PIPE ALONG CELLAR CEILING
- BCP SITE BOUNDARY

SUB-SLAB PLAN NOTES

1. CONTRACTOR COORDINATED INSTALLATION OF SUB-SLAB DEPRESSURIZATION SYSTEM WITH THE FOUNDATION, PLUMBING, MECHANICAL AND ELECTRICAL CONTRACTORS.
2. CONTRACTOR FIELD VERIFIED THE DESIGN INVERT ELEVATIONS (BOTTOM OF PIPING) FOR THE WALL PENETRATIONS. THE CONTRACTOR ALSO FIELD VERIFIED THE HORIZONTAL OFFSETS FOR THE LOCATIONS OF THE VERTICAL RISERS.

SSDS PIPE NOTES

1. CONTRACTOR COORDINATED WITH PLUMBING, MECHANICAL, CIVIL AND ELECTRICAL CONTRACTORS FOR ALL UTILITY CROSSINGS.
2. ALL SSDS PIPING WAS SLOPED TOWARDS THE PERFORATED PIPE PITS TO PREVENT ANY POTENTIAL MOISTURE BUILD UP AND BLOCKAGES.
3. THE SURFACES LINED WITH GEOTEXTILE WERE FREE OF ALL ROCKS, STONES, SHARP OBJECTS OR CONSTRUCTION DEBRIS OF ANY KIND.
4. INSTALLED GEOTEXTILE NONWOVEN FABRIC DIRECTLY ON FILL. MATERIAL OVERLAPS WERE A MINIMUM OF 12" THE OVERLAPPED SEAMS SEALED WITH TAPE.
5. ALL PENETRATIONS THROUGH THE SLAB ON GRADE (SOG) WERE SEALED USING A SILICONE BASED WATERPROOF SEALANT OR EQUIVALENT.

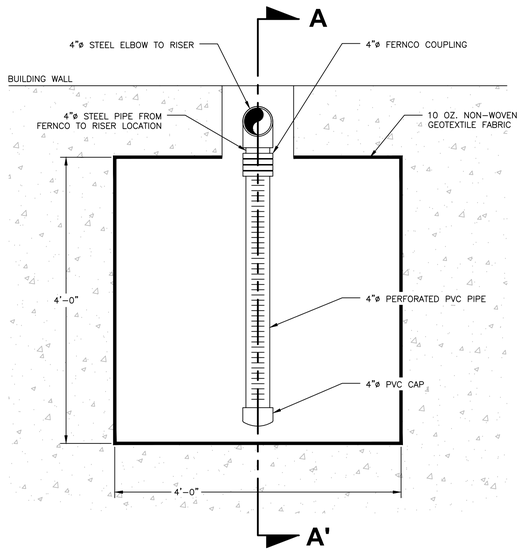


5 ELEVATED SUB-SLAB DEPRESSURIZATION SYSTEM PIT DETAIL

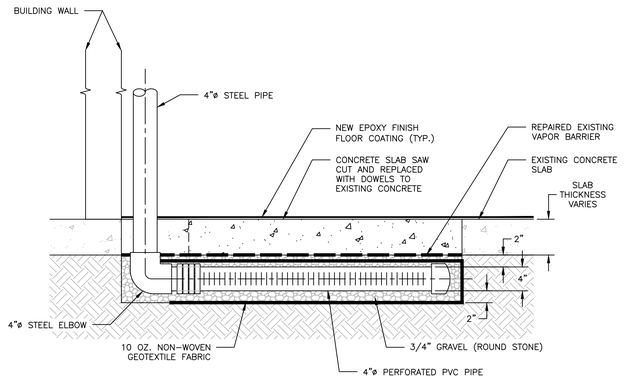
SCALE: N.T.S.

4 EXISTING 2"ø MONITORING POINT COVER

SCALE: N.T.S.



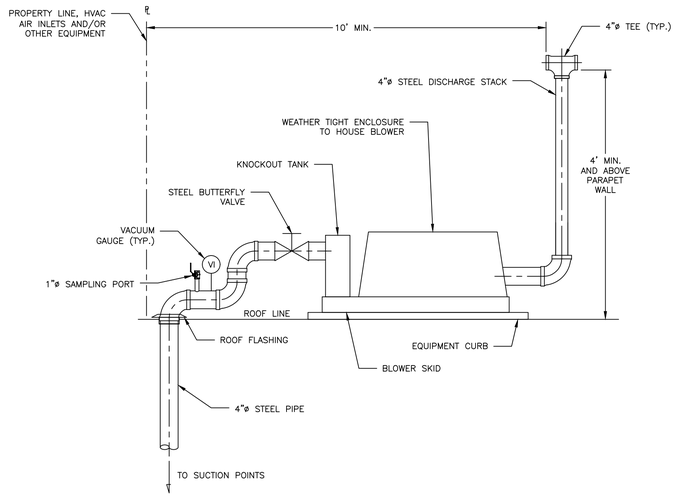
PLAN VIEW



PROFILE VIEW A-A'

1 SUB-SLAB DEPRESSURIZATION SYSTEM PIT DETAIL

SCALE: N.T.S.

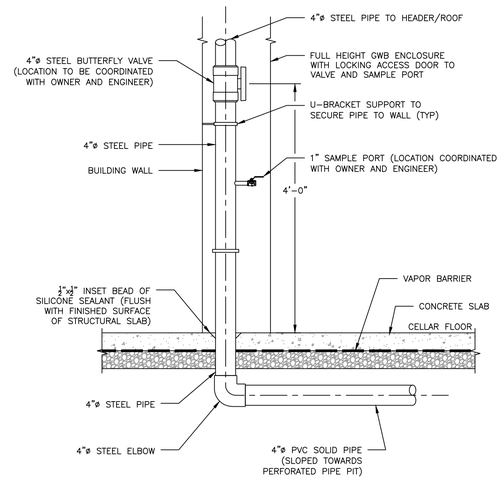


BLOWER NOTES

1. PROVIDED ELECTRICAL/CONTROL CONDUIT TO BLOWER. COORDINATED WITH ELECTRICAL CONTRACTOR.
2. ELECTRICAL CONDUIT SIZED FOR 230/460 VOLT, THREE PHASE, 60 HZ, FOR THE BLOWER MOTOR.
3. THE BLOWER DISCHARGE WAS LOCATED A MINIMUM OF 10 FEET FROM HVAC AIR INLETS, AND PROPERTY LINE.
4. THE BLOWER INSTALLED IS A 2.0 HP, AMETEK ROTRON MODEL EN505AX72ML.
5. THE BLOWER SKID INCLUDES A WEATHER TIGHT ENCLOSURE, PLASTIC KNOCKOUT TANK (WITH HIGH LEVEL ALARM), VACUUM RELIEF VALVE, LOW VACUUM SWITCH, GAUGES, AND INTERCONNECTING PIPING/FITTINGS.
6. A CONTROL PANEL WAS PROVIDED WITH THE BLOWER SKID. THE CONTROL PANEL HAS GREEN OPERATING LIGHTS AND RED ALARM LIGHTS. THE CONTROL PANEL HAS AN ALARM FOR WATER LEVEL IN KNOCKOUT TANK, LOW VACUUM AND NO POWER. THE ALARM SIGNAL IS SENT TO AN APPROPRIATE LOCATION IN THE PROPOSED BUILDING (I.E., SUPERINTENDENT'S OFFICE) AND IS ALSO AUDIBLE.
7. BLOWER WAS PROVIDED WITH A REMOTE ALARM CAPABLE OF ALERTING THE OWNER OF A SYSTEM SHUTDOWN OR LOW VACUUM CONDITION VIA PHONE OR TEXT MESSAGE.
8. BLOWER LOCATION ON ROOF WAS COORDINATED WITH OWNER AND ENGINEER.
9. ALL NECESSARY PIPE SUPPORTS WERE PROVIDED FOR RISERS FROM THE CELLAR SLAB TO THE BLOWER ON THE ROOF.

3 BLOWER DETAIL

SCALE: N.T.S.



2 RISER DETAIL

SCALE: N.T.S.

AS-BUILT DRAWINGS

NO.	DATE	REVISION DESCRIPTION	INT.
4	02DEC21	ADD BCP SITE BOUNDARY AND BCP SITE NUMBER	D.E.K.
3	06NOV20	SSDS AS-BUILT REVISION ADDING SSDS-9 AND SSDS-10	D.E.K.
2	14SEP20	SSDS AS-BUILT	D.E.K.
1	05JUN20	SSDS REVISED AS PER NYSDEC COMMENTS	D.E.K.

STATE OF NEW YORK · DAVID ERIC KAISER · 097317 · LICENSED PROFESSIONAL ENGINEER

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ROUX
Roux Environmental Engineering and Geology, D.P.C.
209 SHAFTER STREET ISLANDIA NEW YORK 11749
(631) 232-2600

PROJECT NAME:
11-20 46TH ROAD OWNER, LLC
11-20 46TH ROAD, LONG ISLAND CITY, NY 11101

PROJECT FOR:
11-20 46TH ROAD OWNER, LLC
11-20 46TH ROAD, LONG ISLAND CITY, NY 11101

TITLE:
SUB-SLAB DEPRESSURIZATION SYSTEM PLAN AND DETAILS
SITE NAME: 11-20 46TH ROAD
BCP SITE NO. C241242

DRAWING NO. 1
DRAWING 1 OF 1

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