Remedial Action Work Plan

The Peninsula
NYSDEC BCP Site No. C203097
1221 Spofford Avenue
Tax Lot 35 of Tax Block 2738
Bronx, New York

December 14, 2018

Prepared for:

The Peninsula JV, LLC
111 8th Avenue
New York, New York 10011

Prepared by:

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

2611.0002Y.121/CV

Table of Contents

Tables

Figures

Appendices

Plates

1. Soil Sample Exceedances of Soil Cleanup Objectives
2. Groundwater Sample Exceedances
3. Soil Vapor Sample Results
4. Remedial Alternative 1: Track 1 Cleanup
5. Remedial Alternative 2: Track 4 Cleanup
6. Post-Construction Endpoint Sample Plan

Certifications

I, Brian P. Morrissey, P.E., certify that I am currently a NYS registered professional engineer and that this Remedial Action Work 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).

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

Brian P. Morrissey, P.E.
NYS Professional Engineer #062617

December 14, 2018
Date

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

Acronym List

Acronym	Definition
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
µg/m3	Micrograms per Cubic Meter
AOCs	Areas of Concern
ASP	Analytical Services Protocol
AWQSGVs	Ambient Water Quality Standards and Guidance Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BLS	Below Land Surface
BOA	Brownfield Opportunity Areas
CAMP	Community Air Monitoring Plan
CLP	Contract and Laboratory Protocol
COC	Contaminant of Concern
CPP	Community Participation Plan
CQAP	Construction Quality Assurance Plan
CVOCs	Chlorinated Volatile Organic Compounds
CY	Cubic Yards
DER-10	NYSDEC Draft DER 10 Technical Guidance for Site Investigation and Remediation
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
EDD	Electronic Data Deliverable
EDR	Environmental Data Resources, Inc.
ELAP	Environmental Laboratory Approval Program
ESA	Environmental Site Assessment
FDNY	Fire Department of the City of New York
FER	Final Engineering Report
FRDS	Federal Reporting Data System
HASP	Health and Safety Plan
IC	Institutional Control
IRM	Interim Remedial Measure
ISCO	In-situ Chemical Oxidation
LBA	Louis Berger and Associates
MDL	Method Detection Limit
mg/kg	Milligrams per Kilogram
MTBE	Methyl Tert-butyl Ether
MW	Monitoring Well

Acronym	Definition
NAVD 88	North American Vertical Datum of 1988
NTUs	Nephelometric Turbidity Units
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	Oxidation – Reduction Potential
PAHs	Polycyclic Aromatic Hydrocarbons
PBS	Petroleum Bulk Storage
PCBs	Polychlorinated Biphenyls
PFAAs	Perfluorinated Alkyl Acids
PFAS	Per- and Polyfluoroalkyl Substances
PFCs	Perfluorinated Chemicals
PGWSCO	Protection of Groundwater Soil Cleanup Objectives
PID	Photo Ionization Detector
PPE	Personal Protective Equipment
PRR	Periodic Review Report
PVC	Polyvinyl Chloride
RAOs	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RL	Reporting Limit
RPD	Relative Percent Difference
RRSCO	Restricted Residential Soil Cleanup Objectives
QA	Quality Assurance
QC	Quality Control
QHHEA	Qualitative Human Health Exposure Assessment
SCGs	Standards, Criteria and Guidance
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOE	Support of Excavation
SoMP	Soil/Materials Management Plan
SSO	Site Safety Officer
SVI	Soil Vapor Intrusion
SVOCs	Semivolatile Organic Compounds
SWPPP	Stormwater Pollution Prevention Plan
TAL	Target Analyte List

Acronym	Definition
TCE	Trichloroethylene
TCL	Target Compound List
TICs	Tentatively Identified Compounds
TOC	Top of Casing
USEPA	United States Environmental Protection Agency
USGS	United States Geological Society
UST	Underground Storage Tank
UUSCO	Unrestricted Use Soil Cleanup Objective
VOCs	Volatile Organic Compounds

Executive Summary

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of The Peninsula JV, LLC (Volunteer), has prepared this Remedial Action Work Plan (RAWP) for a site located at 1221 Spofford Avenue, Borough of the Bronx, City of New York (Figure 1) (Site). The Site is in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), BCP Site No. C203097. The Site is currently occupied by the vacant former Spofford Juvenile Detention facility, later renamed as Bridges Juvenile Center. The Site is the future location of Phase 1 and Phase 2 of the Peninsula Redevelopment Project (Project). The Site encompasses an area of approximately 3.78 acres and is comprised of Block 2738 Lot 35 of the New York City Tax map, as shown on Figure 1.

The Volunteer entered into a Brownfield Cleanup Agreement (BCA), Index No. C203097-10-17; BCP Site No. C203097, with the NYSDEC in November 2017 to investigate, remediate, and redevelop the 3.78-acre Site. The Site is currently owned by the City of New York. The Volunteer has an access agreement with the owner to investigate, remediate, and redevelop the Site.

The proposed Site redevelopment plan consists of mixed use residential, commercial and light industrial uses including the construction of a vibrant live-work campus featuring affordable housing, community space, open/recreational space, industrial space, and retail space. Further details are provided in the BCP application, dated November 2017.

This RAWP summarizes the nature and extent of contamination, as determined from data gathered during the historical investigations. This RAWP provides an evaluation of a Track 1 cleanup (as required) and a Track 4 Restricted Residential Remedial Action alternative, their associated costs, and the recommended and preferred remedy.

Significant Threat

The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does not pose a significant threat to human health and the environment. The significant threat determination letter is provided in Appendix A.

Site Description/Physical Setting/Site History

The Site was the location of the former Spofford Juvenile Detention Facility, later renamed as Bridges Juvenile Center, which was in operation from 1956 until 2011. Based on a 1951 Sanborn® Fire Insurance Map, a stone cutting yard, a dwelling, and “coops” are depicted in the northwestern portion of the Site. Information contained in the 1927 and 1940 City Directory indicated that a ground floor laundry facility with second floor residential apartments (according to Sanborn maps) was located on the southeast side of the property along Spofford Avenue, although the actual period of operation is unknown. The Site is currently vacant and is being demolished in anticipation of proposed remediation and development activities. A Site location map is included as Figure 1.

Property Location	
Property Name:	The Peninsula
Property Address:	1221 Spofford Avenue
Property Town, County, State:	Neighborhood of Hunts Point, Bronx, Bronx County, New York
Property Tax Identification:	Tax Lot 35 of Tax Block 2738
Property Topographic Quadrangle:	Central Park, New York
Nearest Intersection:	Spofford Avenue and Tiffany Street

Property Location	
Area Description:	The Site is in a mixed-use area of the Bronx, New York. To the north is Corpus Christi Monastery; to the South are multi-family residential and commercial properties; to the east are residential properties and to the west is commercial and industrial properties.

Property Information	
Property Acreage:	3.78
Property Shape:	Rectangular
Property Use:	Currently vacant.
Improvements:	Three to six-story building, asphalt paved parking, and recreation/playground spaces such as tennis and basketball courts, comprising the Spofford Juvenile Detention Center.

An Environmental Data Resources, Inc. (EDR) GeoCheck® Report is included in the Roux's 2017 Phase I Environmental Site Assessment (ESA) (Roux, 2017a). The EDR report provides information regarding elevation, regional groundwater flow direction(s), Federal United States Geological Society (USGS) well information, Federal Reporting Data System (FRDS) Public Water Supply system information, and state database well information.

Two (2) 12,000-gallon #2 fuel oil underground storage tanks (USTs) are currently at the Site. In accordance with the Revised-Interim Remedial Measure Work Plan, dated August 6, 2018 and approved by the NYSDEC on August 9, 2018, these USTs were emptied and both tanks were filled with inert nitrogen gas in July 2018. Previously, they were used for heating the former Spofford Juvenile Detention Center. In 2009, there was a documented release of approximately 2,000 gallons of fuel oil from UST supply lines located near the basement boiler room. Following notification to the NYSDEC that a release to subsurface soils had occurred, NYSDEC assigned spill case #0812579. Subsequent investigation conducted on behalf of New York City Department of Juvenile Justice by Louis Berger and Associates (LBA), as described in the May 15, 2009 Remedial Investigation Report (RIR), identified the presence of petroleum contamination in soils immediately surrounding the two existing USTs located in the visitor parking lot outside of the former Spofford Juvenile Detention Center and separate phase product was observed in several soil borings.

Summary of the Remedial Investigations

In summary, the data generated during the RI indicate the following about Site-wide conditions:

- Measurable separate phase product (petroleum) was detected in existing monitoring wells MW-3, MW-4 and MW-5. Based on the petroleum fingerprint analysis conducted on a product sample collected from MW-5, the separate phase product appears to be attributed to the historical fuel oil spill reported in 2009 (NYSDEC Spill #0812579).
- Metals were detected in soil at elevated concentrations above NYSDEC Soil Cleanup Objectives (SCOs) across the Site. Seven (7) metals (arsenic, barium, beryllium, chromium, copper, lead, mercury and zinc) were detected in soil samples exceeding Unrestricted Use Soil Cleanup Objectives (UUSCOs), Restricted Residential Soil Cleanup Objectives (RRSCOs) and/or Protection of Groundwater (PGWSCOs) during the RI and four metals (arsenic, copper, lead and zinc) were detected in soil samples exceeding UUSCOs, RRSCOs and/or PGWSCOs during the 2017 Phase II ESA. The majority of metals exceedances were detected in soil samples collected between the shallow 0-4 feet below land surface (ft bls) interval and are associated with historical fill. However, these metals were not detected in filtered groundwater samples above NYSDEC Ambient Water Quality Standards and Guidance Values (AWQSGVs). The majority of metals exceeding NYSDEC UUSCOs, RRSCOs and/or PGWSCOs were detected in soil samples collected from soil borings located in the northeast

courtyard as well as two locations in the northwest courtyard and one location in the southeast courtyard, which are indicative of historical fill.

- Semivolatile Organic Compounds (SVOCs), primarily Polycyclic Aromatic Hydrocarbons (PAHs) commonly associated with the presence of historical fill, were detected at concentrations above NYSDEC UUSCOs, RRSCOs and/or PGWSCOs in two shallow soil samples (0-2 ft interval) during the RI and four deep samples (between 15 to 19.5 ft bls) during the 2009 investigation completed by Louis Berger & Associates (LBA) at the Site. However, SVOCs were not detected in groundwater at concentrations exceeding NYSDEC AWQSGVs.
- Only one (1) pesticide, 4,4-DDT, was detected above NYSDEC UUSCOs in shallow Site soils (within the 0-3 ft bls interval) at three locations during the RI and three pesticides, 4,4-DDT, 4,4-DDD and 4,4-DDE, were detected above NYSDEC UUSCOs in shallow Site Soils (within 0-2 ft bls and/or 5-6 ft bls) at two locations during the 2017 Phase II ESA. However, these three pesticides were not detected in groundwater.
- Volatile Organic Compounds (VOCs), including chloroform, ethylbenzene, isopropylbenzene and methyl tert-butyl ether (MTBE), were detected in groundwater above NYSDEC AWQSGVs. The petroleum-related VOCs (ethylbenzene and isopropylbenzene) are likely attributed to the historical fuel oil spill. The MTBE detection in RXMW-6 may be attributed to an off-Site source.
- Groundwater elevation at the Site ranges from approximately Elevation (El.) +53 ft North American Vertical Datum of 1988 (NAVD88) (RXMW-10) in the northern portion of the Site to approximately El. +23 ft NAVD88 (RXMW-2) in the southern portion of the Site. Groundwater flow direction appears to mimic bedrock topography and was generally approximated to be in a southern direction towards the East River, with the exception of the central portion of the Site, immediately south and east of Wing F of the existing on-Site building (former boiler room), where groundwater appeared to flow in a southwestern to western direction beneath the building. The change in groundwater direction at this location is likely due to the removal of bedrock during building construction.

Qualitative Human Health Exposure Assessment

As described in Appendix 3B of DER-10, "The overall purpose of the Qualitative Human Health Exposure Assessment (QHHEA) is to evaluate and document how people might be exposed to site-related contaminants, and to identify and characterize the potentially exposed population(s) now and under the reasonably anticipated future use of the site." The following section summarizes the exposure assessment based on data collected during the RI.

Soil Exposure

Soil samples collected during the RI indicated the presence of metals and SVOCs (primarily PAHs) at concentrations above the NYSDEC UUSCOs, RRSCOs and/or PGWSCOs. Additionally, separate phase product was observed in three (3) monitoring wells during the RI and a smear zone in soil may potentially exist in these locations. An individual could be exposed to these contaminants through direct contact with Site soil/smear zone during ground intrusive work at the Site. Direct contact without the use of proper personal protective equipment (PPE) and personal hygiene measures could lead to dermal contact and incidental ingestion of these compounds. Since the Site will be fully fenced during construction activities, and access is controlled, potential contact with Site soil is restricted to remedial and construction contract workers at the Site performing ground intrusive activities in addition to trespassers and passersby. The general public will not be exposed to direct contact with Site soil. Potential worker exposure to contaminated media during remediation and/or redevelopment activities will be mitigated through the implementation of the Site-specific health and safety plan (HASP), required PPE, and worker training. A community air monitoring program (CAMP) will be implemented during intrusive activities to minimize the potential for off-Site exposures from soil/dust leaving the Site.

The proposed plan for Site redevelopment consists of excavation for the construction of a vibrant live-work campus featuring affordable housing, community space, open/recreational space, industrial space, and retail space. The proposed remedy will include excavating all impacted soil. In the event that Site logistics limit extent of excavation, all source material will be removed, and some soil impacted above SCOs may remain in-place. However, the Site will be largely excavated, and the majority of the Site will be covered by buildings,

concrete sidewalks, asphalt parking, etc., therefore, the potential for exposure by direct contact with remaining contaminated soil, if any, will be minimized for both the public and any future construction workers performing ground intrusive activities at the Site.

Groundwater Exposure

Groundwater samples collected during the RI indicated the presence of metals, and VOCs (chloroform, ethylbenzene, isopropylbenzene and MTBE) at concentrations above the NYSDEC AWQSGVs and separate phase product was observed in three groundwater monitoring wells at the Site. Groundwater is not used for drinking or other potable purposes (the area is connected to the public water supply), and there is no direct contact with or ingestion of groundwater by the general public. However, CAMP will be implemented during intrusive activities to minimize the potential for off-Site exposures from vapors potentially volatizing from contaminated groundwater. Furthermore, no public water supply wells are located in the area surrounding the Site.

Individuals who perform intrusive work (i.e., utility construction and/or repair), perform groundwater sampling or remedial activities may come into contact with contaminated groundwater. Proper PPE and personal hygiene measures will be required to prevent dermal contact and the potential for incidental ingestion of these compounds.

The proposed on-Site buildings will be serviced by the public water supply. The proposed remedy to address contaminants in Site groundwater will be removal of the petroleum-related source area (UST removal and petroleum-contaminated soil), dewatering during excavation activities and the use of *In-Situ* Chemical Oxidation (ISCO) below the excavation limits if the UUSCOs cannot be achieved. Based on this, the potential for public exposure by direct contact with contaminated groundwater will be reduced or eliminated.

Soil Vapor Exposure

Soil vapor samples collected during the RI indicated the presence of low-level petroleum-related VOCs and low-level chlorinated VOCs (CVOCs). Presently the Site is vacant, with building demolition occurring as part of the IRM activities, therefore, there is no current potential for soil vapor intrusion.

Individuals who perform intrusive work, perform soil vapor sampling or remedial activities may come into contact with contaminated soil vapor. Potential worker exposure to contaminated soil vapor during sampling and/or remediation and redevelopment activities will be mitigated through the implementation of the HASP, proper PPE and personal hygiene measures. CAMP will be implemented during all intrusive activities to minimize the potential for off-Site exposure from potentially contaminated soil vapor. Also, a roaming PID will be used to monitor work safety during all invasive activities. Vapor suppression may be needed during excavations within the area of observed separate phase product accumulations (MW-3, MW-4 and MW-5).

The proposed remedy will include excavating all impacted soil. In the event that Site logistics limit extent of excavation, all source material will be removed, and some soil impacted above SCOs may remain in-place. However, the Site will be largely excavated, and the majority of the Site will be covered by buildings, concrete sidewalks, asphalt parking, etc., therefore, the potential for exposure by direct contact with remaining contaminated soil, if any, will be minimized for both the public and any future construction workers performing ground intrusive activities at the Site.

A 20-mil vapor barrier or waterproofing membrane will be installed beneath the proposed buildings to prevent the potential migration of vapors into the building from residual contaminated soil and/or contaminated groundwater.

Summary of Remedy

A Track 1 cleanup is proposed consisting of the following remedial components:

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

  - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term.
  - Reducing direct and indirect greenhouse gases and other emissions.
  - Increasing energy efficiency and minimizing use of non-renewable energy.
  - Conserving and efficiently managing resources and materials.
  - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste.
  - Maximizing habitat value and creating habitat when possible.
  - Fostering green and healthy communities and working landscapes with balance ecological, economic and social goals.
  - Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
  - Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier or waterproofing membrane on the foundation to improve energy efficiency as an element of construction.
- Site monitoring of potential airborne VOCs and particulates in accordance with a NYSDEC-approved CAMP during all ground intrusive and soil handling activities.
- Collection and analysis of soil samples during a pre-excavation sampling program to pre-determine the required excavation extents necessary to attain Track 1 SCOs.
- Implementation of dust and odor suppression techniques during all ground intrusive and soil handling activities.
- Installation of dewatering and water treatment system.
- Excavation and offsite disposal of soil exceeding Track 1 UUSCOs as shown on Plate 1.
  - A total of nine hot spot areas were identified throughout the Site, which exceed Track 1 UUSCOs. Hot spot areas that exceeded Track 1 UUSCOs were identified at the following locations: RXMW-9, RXMW-11, RXSB-3, RXSB-5, RXSB-11/RXMW-10, RXSB-12, RXSB-13, RXSB-14, and RXSB-17. The hot spot areas are shown on Plate 4. At each hot spot area, soil will be excavated to bedrock. Approximately, 1,500 CY of soil is anticipated to be excavated from the hot spot areas for offsite disposal.
- Removal of USTs and associated piping and closure of petroleum spill in compliance with applicable local, State and Federal laws and regulations.
- Installation of support of excavation (SOE) as needed for remedial excavations.
- Implementation of soil erosion and sediment controls.
- Screening for indications of contamination (by visual means, odor, and monitoring with photoionization detector [PID]) in all excavated soil during all ground intrusive activities.
- Collection and analysis of Site-wide endpoint to evaluate the performance of the remedy with respect to attainment of Track 1 USCOs. Post-excavation endpoint sampling plan is shown on Plate 6.
- Onsite reuse of material, including crushed concrete from Site demolition activities, in compliance with the Track 1 UUSCOs, as needed for backfill.
- Appropriate offsite disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal.
- A post-construction soil vapor intrusion (SVI) evaluation will be performed in the new buildings, and—if present—SVI will be addressed by a 20-mil vapor barrier or waterproofing membrane integrated into the building foundation and subgrade parking garage with high exchange ventilation system.

- All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.
- Submission of a Final Engineering Report (FER) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
- Following completion of the remedy and prior to issuance of the Certificate of Completion, in order ensure that groundwater meets AWQSGVs or there has been a bulk reduction in groundwater contamination to asymptotic conditions, groundwater monitoring will be performed in accordance with Baseline Sampling Procedures in included in Section 6.2.
- In the event that prior to issuance of the Certificate of Completion onsite groundwater cannot be demonstrated during baseline monitoring to meet AWQSGVs or contain only residual contamination demonstrating that there has been a bulk reduction in groundwater contamination to asymptotic conditions, groundwater remediation will be conducted during construction activities via ISCO to treat contaminants in soil and groundwater below the excavation limits, and post-remedial groundwater monitoring to demonstrate the effectiveness of the remedy will be completed.
- In the event that a Track 1: unrestricted use cleanup is not achieved on any portion of the Site, the following remedial elements will be required and the remedy will achieve a contingency Track 4 restricted-residential cleanup:
    - Site cover system comprised of asphalt covered parking areas, concrete covered sidewalks/walkways, concrete building slab and landscaped areas with a minimum of two feet of cover over existing Site soil that exceeds the RRSCO less than 15 feet below grade, or to bedrock if shallower. A physical demarcation layer, consisting of a 20-mil vapor barrier or waterproofing membrane below the building foundation, the underside of concrete sidewalks/ walkways, the underside of asphalt pavement, or orange snow fencing material, filter fabric or equivalent material in landscaped areas will be used to provide a visual reference above residual contamination.
    - An Environmental Easement, including institutional or engineering controls, to prevent future exposure to any residual contamination remaining at the Site will be recorded in the property title records for the Site. A copy of the environmental easement and Site Management Plan will be submitted as part of the FER, including plans for: (1) institutional and engineering controls, (2) monitoring, (3) operation and maintenance and (4) reporting.

1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of The Peninsula JV, LLC (Volunteer), has prepared this Remedial Action Work Plan (RAWP) for a site located at 1221 Spofford Avenue, Borough of the Bronx, City of New York (Figure 1) (Site). The Site is in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), BCP Site No. C203097. The Site is currently occupied by the vacant former Spofford Juvenile Detention facility, later renamed as Bridges Juvenile Center. The Site is the future location of Phase 1 and Phase 2 of the Peninsula Redevelopment Project (Project). The Site encompasses an area of approximately 3.78 acres and is comprised of Block 2738 Lot 35 of the New York City Tax map, as shown on Figure 1.

The Volunteer entered into a Brownfield Cleanup Agreement (BCA), Index No. C203097-10-17; BCP Site No. C203097, with the NYSDEC in November 2017 to investigate, remediate and redevelop the 3.78-acre Site. The Site is currently owned by the City of New York. The Volunteer has an access agreement to investigate, remediate, and develop the Site.

The proposed Site redevelopment plan consists of mixed use residential, commercial and light industrial uses including the construction of a vibrant live-work campus featuring affordable housing, community space, open/recreational space, industrial space, and retail space. Further details are provided in the BCP application, dated November 2017.

This RAWP summarizes the nature and extent of contamination as determined from data gathered during the historical investigations, performed between 2009 and 2018. The objectives of the RI were to determine the nature and extent of contamination at the Site, characterize environmental media at the Site, qualitatively assess the potential exposure of receptors to Site contaminants, and generate sufficient data necessary to support the development of a RAWP, based on the proposed future use of the Site as mixed residential, commercial and light industrial use.

This RAWP provides an evaluation of a Track 1 cleanup and a Track 4 Restricted Residential Remedial Action alternative, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements.

No additional formal Remedial Design document will be prepared, as all details for the remedial action are included within this document.

1.1 Site Location and Description

Property Location	
Property Name:	The Peninsula
Property Address:	1221 Spofford Avenue
Property Town, County, State:	Neighborhood of Hunts Point, Bronx, Bronx County, New York
Property Tax Identification:	Tax Lot 35 of Tax Block 2738
Property Topographic Quadrangle:	Central Park, New York
Nearest Intersection:	Spofford Avenue and Tiffany Street

Property Information	
Property Acreage:	3.78
Property Shape:	Rectangular
Property Use:	Site is currently vacant.
Improvements:	Site contains a three to six-story building, asphalt paved parking, and recreation/playground spaces such as tennis and basketball courts, comprising the Spofford Juvenile Detention Center.

The Site location is depicted on Figure 1. A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The property is shown on the Tax Map included in Appendix B.

1.2 Contemplated Redevelopment Plan

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan and end use is described here to provide the basis for this assessment. It should be noted that the Remedial Action has been designed around the proposed redevelopment plan.

The proposed redevelopment plan for the Site will be for mixed use residential, commercial and light industrial uses including the construction of a vibrant live-work campus featuring affordable housing, community space, open/recreational space, industrial space, and retail space. The development will consist of four separate buildings with publicly accessible open space and centralized below-grade parking.

1.3 Description of Surrounding Properties

The Site is located in a mixed-use area of the Bronx, New York. The adjacent and nearby property usage is shown in Figure 2.

A review of neighboring properties, public thoroughfares, and research of available information regarding the neighboring properties, was performed to identify areas of off-Site environmental concern that could potentially adversely impact the Site. The Site is bordered to the south by mixed use multi-family residential properties and commercial properties. The Corpus Christi Monastery is located to the north of the Site. Multi/single-family residential properties, commercial properties, and warehouses are located west of the Site. Single-family residential properties are located to the east of the Site. There is no agricultural land use within a one-half-mile radius of the Site. There are several parks within a one-half-mile radius of the Site, including Julio Carballo Fields to the northeast and Hunts Point Playground to the southeast.

2. Description of Remedial Investigation Findings

The Site was investigated in accordance with the Scope of Work presented in the Remedial Investigation Work Plan (RIWP) dated February 6, 2018. All work was also performed in accordance with NYSDEC DER 10 Technical Guidance for Site Investigation and Remediation (May 2010). In consultation with NYSDEC, field activities were completed in two phases due to ongoing interior asbestos abatement within the existing Site buildings, which prevented access to sample locations along Tiffany Street, within the building and in the northeast courtyard. The first phase of the RI was completed in April/May 2018, the second phase of the RI was completed in May/June 2018.

Previously, environmental related activities were performed at the Site from 2009 through 2017. A summary of the previous environmental activities as well as the 2018 RI performed is provided below.

2.1 Summary of Remedial Investigations Performed

This section presents a detailed description of the RI activities performed to characterize the soil, groundwater and soil vapor at the Site.

2.1.1 Soil Borings and Sampling Activities

From April 26, 2018 through June 22, 2018, a total of 24 soil borings were installed and 55 soil samples were collected as part of the RI. Soil boring locations are shown on Figure 3.

Following utility clearances, soil borings were advanced using Geoprobe® direct push technology, Sonic technology or hand tools. Limited access and/or shallow borings necessitated the use of a Geoprobe® drill rig and/or hand tools. Ten soil borings, RXSB-11 through RXSB-17, RXMW-3, RXMW-8, and RXTGW-12, were advanced with Geoprobe® direct push methods using five-foot long macro core samplers, and soil was collected from land surface to bedrock at each location. RXMW-3 and RXMW-8 were terminated approximately five feet into bedrock utilizing a Geoprobe® fitted with a compressed air hammer. Nine soil borings, RXMW-1, RXMW-2, RXMW-4 through RXMW-7, and RXMW-9 through RXMW-11, were advanced with a Sonic drill rig and were terminated approximately five feet into bedrock. RXMW-5 was terminated approximately 8 feet into bedrock.

During soil boring installations, the lithology was recorded, and soil was visually inspected for evidence (visual and/or olfactory) of contamination and field screened continuously for VOCs using a PID with a 10.6 eV lamp at each soil boring location.

Two soil samples were typically collected for laboratory analyses from each soil boring location. A shallow soil sample was collected from 0 to 2 ft bls, and a deeper soil sample was collected from either the 2-ft interval containing indications of contamination (either observed contamination as described above, or elevated PID measurements) or the 2-ft interval directly above competent bedrock.

2.1.2 Groundwater Investigation

To characterize onsite groundwater flow and quality conditions, 11 new monitoring wells were installed to augment the current monitoring well network.

2.1.2.1 Monitoring Well Installation

On April 25, 2018 to June 15, 2018 a total of 11 groundwater monitoring wells (RXMW-1 Through RXMW-11) were installed at the Site. Groundwater monitoring well (monitoring well) locations are shown on Figure 3. The monitoring well locations were selected to evaluate groundwater quality in areas not previously monitored, while also helping to refine the understanding of Site groundwater flow.

All newly installed monitoring wells were constructed of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and approximately 5-ft to 8-ft of 2-inch diameter, 20-slot (0.020 inches) PVC screen flush-threaded

onto the PVC casing. The screened intervals of the wells were based on depth to groundwater field observations made during drilling.

During monitoring well installation activities, #1 sand filter pack was placed around the well screen to approximately 2-ft above the top of the well screen. The annulus above the filter pack was sealed with a two- to three-foot hydrated bentonite seal. A cement-bentonite grout was then placed in the annulus above the bentonite seal to approximately 4-inches bls. Surface completion of each monitoring well consisted of a locking J-plug and a protective flush-mounted manhole cover. Immediately following installation, newly constructed monitoring wells were developed using a surge block and submersible pump to equilibrate monitoring well water levels with the surrounding formation and to remove fine sediments from the well and filter pack.

2.1.2.2 Groundwater Gauging and Sampling

On June 22, 2018, groundwater levels were measured by Roux to evaluate Site-wide groundwater elevations and groundwater flow. Groundwater levels were collected with an electronic oil/water interface probe. All groundwater level measurements were collected on the same day to provide a snapshot of the Site-wide conditions.

On June 21, 2018 through June 22, 2018, a comprehensive groundwater sampling event was completed at the Site. Groundwater samples were collected from newly installed monitoring wells, RXMW-1 through RXMW-11, and from existing monitoring wells, MW-1, MW-2 and MW-6. Groundwater samples were not collected from existing wells MW-3 through MW-5 due to the presence of measurable separate phase product. Groundwater samples were collected using the methods described in the USEPA guidance document titled "Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling" (USEPA, 2010) and the NYSDEC Perfluorinated Compounds (PFCs) Groundwater Samples from Monitoring Wells Sample Protocol Revision 1.2 dated June 29, 2016. During purging, a water quality meter was used to monitor water quality indicator parameters such as pH, dissolved oxygen, conductivity, temperature, turbidity, and oxidation reduction potential (ORP).

On June 22, 2018, a product sample was collected from existing monitoring well, MW-5 for petroleum fingerprint analysis.

2.1.3 Soil Vapor Investigation

On April 25, 2018 through June 15, 2018, a total of 11 soil vapor monitoring points (RXSV-4 through RXSV-14) and four sub-slab soil vapor points (RXSS-2 through RXSS-5) were installed at the Site using a Geoprobe® drill rig or hand tools. As per NYSDEC request, soil vapor samples were collected at RXSV-9 and RXSV-11, on April 25, 2018, prior to completing other soil vapor point installations, so the data from these two locations could be included in an Interim Remedial Measure Work Plan for the Site. Soil vapor and sub-slab soil vapor monitoring point locations are shown on Figure 3.

At soil vapor monitoring point locations, RXSV-4 through RXSV-14, a six-inch long, stainless steel, sample screen attached to Teflon-lined polyethylene sample tubing was installed approximately one to two feet above bedrock and coarse sand was added to six inches above the top of the screen creating a one-foot sample zone. A two to five feet thick layer of bentonite was added to the top of the sand, hydrated, and the remainder of the boring annulus was filled with a cement-bentonite grout. The surface was completed with a secure, five-inch diameter, flush-mounted curb box concreted at grade.

At sub-slab soil vapor point locations, RXSS-2 through RXSS-5, a three-inch long, Cox-Colvin stainless steel Vapor Pin® (vapor pin), fitted with a silicon sleeve, was installed in the concrete floor slabs using a hammer driller. When installed, the silicon sleeve creates an air tight seal between the vapor pin and the concrete. The surface was completed with a 2-inch diameter, flush-mounted, stainless steel cap.

Soil vapor samples were collected from newly installed soil vapor monitoring points, RXSV-9 and RXSV-11 on March 23, 2018, from RXSV-4, RXSV-5, RXSV-7, RXSV-10 and RXSS-2 through RXSS-5 on June 4, 2018, and from RXSV-12 through RXSV-14 on June 22, 2018. Soil vapor samples were not collected from RXSV-6 and RXSV-8 due to perched water in the sample tubing. All soil vapor samples were collected in

accordance with the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH Guidance).

Prior to sample collection, the integrity of each sample point seal was verified via a helium gas tracer test. This step was conducted as a quality assurance/quality control measure to verify that the soil vapor sample was not compromised by the inadvertent introduction of ambient air into the sample. During the helium gas tracer test, soil vapor was purged from the point using an air pump calibrated to approximately 0.2 liters per minute while the sampling point was covered at the surface with a small enclosure that was partially filled with helium. The soil vapor discharging from the air pump and the air within the enclosure was continuously screened for helium during purging. At all of the soil vapor and sub-slab soil vapor sample locations, helium was not detected from the sample tubing greater than 10% of the helium detected in the enriched area (i.e., within the bucket), therefore, the helium tracer test verified the integrity of the surface seal of the soil vapor and sub-slab soil vapor monitoring points.

Following tracer gas testing, the sample tubing at each sample point was purged of approximately two volumes of the tubing using a vacuum pump set at a rate of approximately 0.2 liters per minute. Following purging, the tubing was connected to the laboratory supplied 2.7-liter Summa canister. All soil vapor samples were collected using pre-cleaned 2.7-liter summa canisters with regulators calibrated to collect samples over a 2-hour period.

2.1.4 Laboratory Analyses, Quality Assurance/Quality Control Sampling and Data Usability Summary Report

All soil samples were placed in the appropriate containers and sent, under chain-of-custody procedures, to TestAmerica Laboratories, Inc. (TestAmerica) of Edison, New Jersey, a laboratory with a current NYSDOH Environmental Laboratory Approval Program (ELAP) Contract and Laboratory Protocol (CLP) and analyzed for the following parameters:

- Full Target Compound List (TCL) VOCs and SVOCs plus 30 tentatively identified compounds (TICS) via United States Environmental Protection Agency (USEPA) Methods 8260C and 8270D, respectively;
- Target Analyte List (TAL) metals via USEPA Method 6020A;
- Polychlorinated Biphenyls (PCBs) via USEPA Method 8082A;
- TCL pesticides via USEPA Method 8081B;
- TCL herbicides via USEPA Method 8151A;
- Hexavalent chromium using USEPA method 7196A; and
- Total cyanide via USEPA Method 9012B.

In accordance with the RIWP, soil samples collected from RXSB-3A, RXSB-3AN, RXSB-3AW, RXSB-3AS and RXSB-3AS were analyzed for TAL metals only.

Groundwater samples collected during the RI were analyzed for the following parameters:

- TCL VOCs and SVOCs plus 30 TICs via USEPA Methods 8260C and 8270D, respectively;
- Total and dissolved TAL metals via USEPA Method 6020A, including mercury using Method 7470A;
- PCBs via USEPA Method 8082A;
- TCL pesticides via USEPA Method 8081B;
- TCL herbicides via USEPA Method 8151A;
- Hexavalent chromium using USEPA method 7196A; and
- Total cyanide via USEPA Method 9012B.

Additionally, groundwater samples collected from RXMW-2, RXMW-4 and RXMW-7 were also analyzed for Per- and Polyfluoroalkyl Substances (PFAS) using USEPA Method 537M and 1,4-Dioxane using USEPA Method 8270. All groundwater samples were placed in the appropriately preserved containers and were sent to TestAmerica under chain-of-custody procedures.

A product sample was collected from existing monitoring well, MW-5, and sent to Torkelson Geochemistry, Inc. of Tulsa, Oklahoma, under chain-of-custody procedures, for petroleum fingerprint analysis.

All soil vapor and sub-slab vapor samples were sent to TestAmerica, under chain-of-custody procedures, and analyzed for VOCs using USEPA Method TO-15.

Quality Assurance/Quality Control (QA/QC) sampling during the RI included collection of one duplicate, one field blank and one matrix/matrix spike (MS/MSD) sample per 20 field samples and one trip blank per cooler for soil and groundwater.

The laboratory reported the results for the RI in Analytical Services Protocol (ASP) Category B deliverables packages. An electronic data deliverable (EDD) in the required NYSDEC format was provided by the laboratory. Data Usability Summary Reports (DUSRs), prepared in accordance with Appendix 2B of DER-10, are provided in Appendix E of the RIR, and a brief summary of the DUSR findings is presented below.

Sample analyses were found generally compliant with the method requirements. Most of the sample data are usable as reported or with minor qualification or edit ("J" or "UJ" qualifier), with the following exceptions:

- The volatile results for RXSB-17_0-2 were rejected due to an improper sealing of the Encore container. Although rejected, it is noted that the volatile data of the field duplicate of this sample is acceptable and represents the constituency at this location.
- One volatile analyte result in one sample is rejected due to an apparent matrix effect.
- Results for one SVOC analyte in eight samples are rejected due to processing.
- Results for three SVOC analytes in one sample and one SVOC analyte in each of two other samples were rejected due to apparent matric effects.
- The hexavalent chromium result in one sample was rejected due to delayed request for processing.

The data tables have been annotated to reflect the findings from the DUSR.

2.1.5 Surveying Activities

All newly installed monitoring wells, and existing monitoring wells, MW-1 through MW-6, were surveyed by a New York State licensed surveyor to obtain surface and top of well casing elevations as well as horizontal and vertical survey coordinates.

2.1.6 Significant Threat

The NYSDEC and NYSDOH have determined that this Site does not pose a significant threat to human health and the environment based upon their review of the RIR. The significant threat determination letter is provided in Appendix A.

2.2 Site History

This section provides pertinent background information, including a description of the Site and its setting, the known history of the Site, and the results of preliminary environmental investigation work conducted at the Site.

2.2.1 Past Uses

The Site was the location of the former Spofford Juvenile Detention Facility, later renamed as Bridges Juvenile Center, which was in operation from 1956 to 2011. Based on a 1951 Sanborn® Fire Insurance Map,

a stone cutting yard, a dwelling, and "coops" are depicted in north-western portion of the Site. Information contained in the 1927 and 1940 City Directory indicated that a ground floor laundry facility with second floor residential apartments (according to Sanborn maps) was located on the southeast side of the property along Spofford Avenue; the actual period of operation is unknown. The Site was vacant and interior asbestos abatement was occurring in April 2018 during completion of RI activities.

2.2.2 Past Investigations and Remediation

This section provides an overview of previous environmental-related activities completed at the Site, based on a review of readily available information and the following previously completed environmental reports:

- RIR prepared by LBA, dated May 15, 2009;
- Remedial Action Plan (RAP) prepared by LBA, dated May 21, 2010;
- Phase I ESA prepared by Arcadis, Inc., dated June 3, 2016;
- Groundwater Monitoring and Remediation Report for the Fourth Quarter 2016 prepared by URS, dated January 25, 2017;
- Roux Phase I ESA, dated July 11, 2017; and
- Roux Phase II ESA, dated August 10, 2017.

A summary of findings from these reports is provided below.

2.2.2.1 Remedial Action Plan (LBA 2010)

(also includes 2009 Remedial Investigation by reference)

The 2010 LBA RAP, prepared on behalf of New York City Department of Juvenile Justice, documents the investigation and proposed remedy for a #2 fuel oil release (NYSDEC Spill #0812579) that occurred at the Site on February 18, 2009. Approximately 2,000 gallons of #2 fuel oil was released to the subsurface from two 12,000-gallon underground storage tanks (USTs) located in the southeast courtyard of the Site.

The LBA RAP also documents analytical data and findings from an RI that was implemented by LBA between March 23-27, 2009. During the LBA RI, petroleum contamination was found in subsurface soils immediately surrounding the two USTs. In addition, separate phase petroleum product was observed atop groundwater perched above bedrock at soil borings installed in the boiler room adjacent to the north of the USTs and the exterior lot adjacent to the USTs.

The RI concluded the following:

- Soil contamination, including petroleum-related VOCs and SVOCs, exist at concentrations that exceed prior established standards, (and the current RRSCOs, the anticipated Site use).
- The gravel sub-base of the concrete basement floor and the assumed gravel sub-base beneath the (presumed) UST vault likely provide a preferential pathway for the fuel oil release.
- Separate phase product was present in the basement in the three borings SB-01B, SB-02, and SB-03 located closest to the vault.
- There are indications beneath the basement slab that a separate historical release occurred at the Site.
- Separate phase product was observed in two exterior borings, SB-15 and SB-16, located approximately 3 feet east of the UST vault.
- Only localized pockets of perched water were observed and only beneath the basement; no groundwater was observed in the exterior borings.

As a result of the presence of separate phase petroleum product and extensive soil contamination, the 2010 LBA RAP proposed separate phase petroleum product recovery using dual-phase extraction and surfactant

injection. Since contaminated soil would likely remain following implementation of the dual-phase extraction system, LBA concluded that engineering and institutional controls would be required to prevent unnecessary direct contact with the soil. This remedial approach was never implemented by LBA.

LBA RI Soil Conditions

VOCs – Nine of the 27 soil samples collected as part of the LBA RI contained VOCs at a concentration above the NYSDEC UUSCOs and RRSCOs.

The highest VOC concentrations were detected at location SB-16A (15.5-16 ft bls):

- 1,2,4–Trimethylbenzene – 790 milligrams per kilogram (mg/kg) (compared to 3.6 mg/kg UUSCOs, and 52 mg/kg RRSCOs);
- 1,3,5–Trimethylbenzene – 180 mg/kg (compared to 8.4 mg/kg UUSCOs, and 52 mg/kg RRSCOs);
- Ethylbenzene – 120 mg/kg (compared to 1 mg/kg UUSCOs, and 41 mg/kg RRSCOs);
- Napthalene – 390 mg/kg (compared to 12 mg/kg UUSCOs, and 100 mg/kg RRSCOs);
- n-Butylbenzene – 60 mg/kg (compared to 12 mg/kg UUSCOs, and 100 mg/kg RRSCOs);
- n-Propylbenzene – 110 mg/kg (compared to 3.9 mg/kg UUSCOs, and 100 mg/kg RRSCOs);
- sec-butylbenzene – 68 mg/kg (compared to 11 mg/kg UUSCOs, and 100 mg/kg RRSCOs);
- Toluene – 120 mg/kg (compared to 0.7 mg/kg UUSCOs, and 100 mg/kg RRSCOs); and
- Xylenes (total) – 730 mg/kg (compared to 0.26 mg/kg UUSCOs, and 100 mg/kg RRSCOs).

SVOCs – SVOCs exceeded the UUSCOs and RRSCOs in soil samples SB-18B and SB-20, located immediately to the north and west of the existing USTs. The SVOC analyte concentrations at SB-18B (18.5-19 ft bls) and SB-20 (17-17.5 ft bls) were relatively the same as reported respectively below:

- benzo(a)anthracene – 28 mg/kg and 28 mg/kg, respectively (compared to 1 mg/kg [UUSCOs and RRSCOs]);
- benzo(a)pyrene – 14 mg/kg and 16 mg/kg (compared to 1 mg/kg [UUSCOs and RRSCOs]);
- benzo(b)fluoranthene – 21 mg/kg and 25 mg/kg (compared to 1 mg/kg [UUSCOs and RRSCOs]);
- benzo(k)fluoranthene – 8.9 mg/kg and 9.5 mg/kg (compared to 0.8 mg/kg UUSCOs, and 3.9 RRSCOs);
- chrysene – 23 mg/kg and 26 mg/kg (compared to 1 mg/kg UUSCOs, and 3.9 RRSCOs);
- dibenzo(a,h)anthracene – 2.2 mg/kg and 2.3 mg/kg (compared to 0.33 mg/kg [UUSCOs, and RRSCOs]);
- indeno(1,2,3-cd)pyrene – 6 mg/kg and 6.4 mg/kg (compared to 0.5 mg/kg [UUSCOs, and RRSCOs]); and
- naphthalene – 12 mg/kg at SB-18B (compared to 12 mg/kg UUSCOs).

LBA RI Groundwater Conditions

Temporary groundwater monitoring wells TWP01 through TWP04 were installed at basement boring locations SB-05B, SB-08, SB-10 and SB-12, respectively. TPH concentrations in groundwater ranged from 2,700 micrograms per liter (µg/L) in TWP03 to 6,500 µg/L in TWP04. VOCs were detected in groundwater at all four locations at concentrations above the NYSDEC AWQSGVs. The only SVOC detected in groundwater at a concentration above the AWQSGVs was naphthalene at a concentration of 12 µg/L in sample TWP03.

2.2.2.2 Groundwater Monitoring and Remediation Report Fourth Quarter 2016 (URS, 2017)

URS, on behalf of New York City Administration for Children's Services (NYCACS), implemented a monthly separate phase petroleum product recovery program in September 2014 and quarterly groundwater sampling. An estimated 11.75 gallons of product was recovered between September 2014 and October 2016. Separate phase petroleum product was initially recovered using a peristaltic pump and by June 2015, the separate phase petroleum product thickness in the monitoring wells had decreased substantially enough to switch to using petroleum absorbent socks in monitoring wells MW-02, MW-03, MW-04, and MW-05 for recovery. However, due to the amount of separate phase petroleum product present at monitoring well MW-05 manual product recovery with a pump resumed in November 2015. From May through August 2016, no separate phase petroleum product was detected in this well but in October 2016, product was measured at a thickness of 0.05 feet.

Separate phase petroleum product was detected at monitoring well MW-06 in February 2016 and was detected monthly thereafter. A petroleum absorbent sock was installed in MW-06 in April 2016 and replaced monthly. During the October 2016 monitoring event product was not detected at MW-06.

Due to the continued presence of separate phase petroleum product in monitoring wells MW-02, MW-03, MW-04, and MW-05, groundwater was not sampled from these monitoring wells. Groundwater sampling had occurred quarterly at MW-01, the following analytes were present at concentrations above the AWQSGVs during the October 2016 sampling round:

- Benzene 3.3 µg/L (compared to 1 µg/L AWQSGVs);
- Ethylbenzene 67.9 µg/L (compared to 5 µg/L AWQSGVs);
- Total Xylenes 79.7 µg/L (compared to 5 µg/L AWQSGVs);
- Isopropylbenzene 17.2 µg/L (compared to 5 µg/L AWQSGVs);
- n-Propylbenzene 30.1 µg/L (compared to 5 µg/L AWQSGVs);
- p-Isopropyltoluene 9.1 µg/L (compared to 5 µg/L AWQSGVs);
- 1,2,4–Trimethylbenzene 313 µg/L (compared to 5 µg/L AWQSGVs);
- 1,3,5- Trimethylbenzene 70 µg/L (compared to 5 µg/L AWQSGVs);
- n-Butylbenzene 12.2 µg/L (compared to 5 µg/L AWQSGVs); and
- Naphthalene 112 µg/L (compared to 10 µg/L AWQSGVs).

Monitoring Well, MW-06, was also sampled for VOCs and SVOCs in 2016 when separate phase petroleum product was not present (January and October 2016). Neither VOCs or SVOCs were not detected above reporting limits during the sampling events, with exception of one SVOC, Naphthalene, which was detected at a concentration of 36 µg/L, above the AWQSGV of 10 µg/L during the January 2016 sampling event. CVOCs were not analyzed in groundwater during those sampling events.

2.2.2.3 Roux Phase I ESA (2017)

Roux completed a Phase I ESA in 2017, as part of the ESA, the following environmental concerns were identified:

- Documented petroleum contamination in soil and groundwater as a result of the fuel oil release from UST supply lines located near the basement boiler room of the Spofford Juvenile Detention Center. Based on information reviewed by Roux, it was assumed that separate phase petroleum product and extensive soil contamination still exists at the Site.
- The following table summarized findings from NYSDEC Petroleum Bulk Storage (PBS) Records for the Site, which is currently registered under PBS#2-604085.

Tank ID	Tank Location	Tank Contents	Capacity (Gal)	Status
1	Underground	#6 Fuel Oil	20,000	Closed-Removed 2002
2	Underground	#2 Fuel Oil	12,000	In Service
3	Underground	#2 Fuel Oil	12,000	In Service
Diesel	Aboveground (in vault)	Diesel (generator)	5,000	Closed in Place 2002
Heat	Aboveground (in vault)	Closed – Removed	20,000	Closed in Place 2002

- Staining: Staining observed on the concrete basement floor was presumably associated with oil spills and cleanup materials, and other universal wastes (such as batteries) or degreasers, electrical equipment, and lubricating oils).
- Historical Uses: The Site was occupied by a laundry facility, stone cutting yard, and an asphalt paving contractor prior to being developed as a juvenile detention center. It is possible that potential undocumented releases from the operations may have impacted the subsurface at the Site.

In accordance with the Revised-Interim Remedial Measure Work Plan, dated August 6, 2018 and approved by the NYSDEC on August 9, 2018, existing Tanks 2 and 3 were emptied and both tanks were filled with inert nitrogen gas in July 2018]. Detailed information regarding the temporary tank closure will be included in the Construction Completion Report (CCR) to be prepared following receipt of all data and all final disposal documentation.

2.2.2.4 Roux Phase II ESA (2017)

In 2017, Roux completed a Phase II ESA for the Site. This investigation consisted of 6 soil borings with 12 soil samples, one sub-slab soil gas sample, and two soil vapor samples. Groundwater was not collected as part of this assessment. The results of the Phase II ESA and Roux's conclusions related to environmental conditions at the Site are summarized in the soil and soil vapor sections below.

Soil Conditions
Previous investigations indicated the presence of petroleum-related VOCs in soils at concentrations above UUSCOs, RRSCOs and/or PGWSCOs associated with releases from former tank systems and/or other Site uses.

Several petroleum-related and historic fill-related SVOCs were detected in shallow soil (i.e., 0-2 ft bls) at concentrations above the UUSCOs, RRSCOs and/or PGWSCOs. Arsenic was detected in soil at a concentration above UUSCOs, RRSCOs and PGWSCOs from one shallow soil sample. Copper, lead and zinc were detected in soil at concentrations above UUSCOs but below RRSCO and PGWSCOs.

VOCs - There were no VOC detections above NYSDEC UUSCOs, and RRSCOs.

SVOCs - As shown in Table 3 of the RIWP, six SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and/or indeno(1,2,3-c,d)pyrene) were detected in three of the 19 samples, including the duplicate sample, at concentrations exceeding UUSCOs, and/or RRSCOs. Laboratory analytical data for the SVOC soil exceedances are summarized below.

- Benzo(a)anthracene was detected in samples RXSB-4 (0-2), and RXSB-6 (0-2) at a concentration of 4 mg/kg, and 1.5 mg/kg, respectively (compared to 1 mg/kg [UUSCOs, and RRSCOs]).
- Benzo(a)pyrene was detected in samples RXSB-4 (0-2) at a concentration of 3.5 mg/kg (compared to 1 mg/kg [UUSCOs and RRSCOs]).
- Benzo(b)fluoranthene was detected in samples RXSB-4 (0-2), and RXSB-6 (0-2) at concentrations of 4.8 mg/kg, and 1.4 mg/kg, respectively (compared to 1 mg/kg [UUSCOs, and RRSCOs]).

- Benzo(k)fluoranthene was detected in sample RXSB-4 (0-2) at a concentration of 1.5 mg/kg (compared to 0.8 mg/kg [UUSCOs].
- Chrysene was detected in samples RXSB-4 (0-2), and RXSB-6 (0-2) at a concentration of 3.5 mg/kg, and 1.3 mg/kg, respectively (compared to 1 mg/kg [UUSCOs]).
- Dibenzo(a,h)anthracene was detected in samples RXSB-4 (0-2) at a concentration of 0.580 mg/kg (compared to 0.330 mg/kg [UUSCOs]).
- Indeno(1,2,3-c,d)pyrene was detected in samples RXSB-4 (0-2), and RXSB-6 (0-2) at a concentration of 2.5 mg/kg, and 0.580 mg/kg, respectively (compared to 0.500 mg/kg [UUSCOs and RRSCOs]).

Metals – As shown in Table 4 of the RIWP, four metals (arsenic, copper, lead and/or zinc) were detected in six of the 19 soil samples, including the duplicate sample, at concentrations exceeding UUSCOs, RRSCOs and/or PGWSCOs. Laboratory analytical data for soil exceedances for metals are summarized below.

- Arsenic was detecting in sample RXSB-3 (0-2) at a concentration of 18 mg/kg (compared to 13 mg/kg [UUSCOs] and 16 mg/kg [RRSCOs]).
- Copper was detected in samples RXSB-3 (0-2), RXSB-6 (0-2) and RXSB-6 (8-10) at a concentration of 64 mg/kg, 190 mg/kg and to 72 mg/kg, respectively (compared to 50 mg/kg [UUSCOs]).
- Lead was detected in samples RXSB-4 (0-2) and RXSB-6 (0-2) at a concentration of 64 mg/kg and 150 mg/kg, respectively (compared to 63 mg/kg [UUSCOs]).
- Zinc was detected in samples RXSB-3 (0-2), RXSB-4 (0-2), RXSB 5 (0-2), RXSB-6 (0-2) and RXSB-6 (8-10) at concentrations ranging from 120 mg/kg to 1,200 mg/kg (compared to 109 mg/kg [UUSCOs]).

PCBs – As shown Table 5 of the RIWP, PCBs were not detected at concentration exceeding UUSCOs, or RRSCOs during the Phase II ESA.

Pesticides – As shown in Table 6 of the RIWP, three pesticides (4,4-DDD, 4,4-DDE and/or 4,4-DDT) were detected in three of the 19 samples, including the duplicate sample, at concentrations exceeding UUSCOs only. Laboratory analytical data for the soil exceedances for pesticides are summarized below.

- 4,4-DDD was detected in samples RXSB-4 (0-2) Duplicate and RXSB-5 (5-6) at a concentration of 0.00457 mg/kg and 0.0616 mg/kg, respectively (compared to 0.0033 mg/kg [UUSCOs]).
- 4,4-DDE was detected in sample RXSB-5 (5-6) at a concentration of 0.0766 mg/kg (compared to 0.0033 mg/kg [UUSCOs]).
- 4,4-DDT was detected in samples RXSB-5 (5-6) at a concentration of 0.513 mg/kg (compared to 0.0033 mg/kg [UUSCOs]).

Soil Vapor Conditions

Several petroleum-related VOCs and chlorinated VOCs were detected in soil vapor samples throughout the Site. Specifically, three petroleum-related VOCs were detected at elevated concentrations in the sub-slab soil gas sample (RXSS-1): benzene detected at a concentration of 377 micrograms per cubic meter (µg/m^3), cyclohexane detected at a concentration of 20,200 µg/m^3, and propylene detected at a concentration of 181 µg/m^3. The source of the petroleum-related VOCs is likely attributed to the 2009 #2 fuel oil spill and/or other historic spills.

One sample location (RXSV-2) contained concentrations of Trichloroethylene (TCE) (1.75 µg/m^3) in soil vapor that exceeded the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York Soil Vapor Intrusion Guidance Matrices of May 2017.

2.2.3 Sanborn Maps

Certified Sanborn Maps were obtained from EDR for the years ranging from 1896 to 2007. The following is a general summary of the Site and surrounding property usage, as determined by the review of the Certified Sanborn Maps:

Timeline	
Date	**Description**
1896	The Site and majority of the surrounding area is not developed.
1901, 1903	One 2-story structure (presumed to be residential) is noted on Lot 35 (1901).
	The Corpus Christi Monastery is noted immediately north of the Site. Additional structures in the surrounding area of the Site are presumed to be 2- and 3-story residential structures.
1915	A stone cutting yard with an office and one 1-story residential structure are noted in the northwest corner of Lot 35.
1950	The stone cutting yard has expanded to include approximately six automobile garages and an office. A second residential dwelling is noted in the area of the stone yard.
	The surrounding area is significantly developed since the 1915 Certified Sanborn map. The majority of developments are single- and multi-family residential buildings. In addition, two garages utilizing gasoline tanks are noted across Spofford Avenue to the south of the Site. A metal works facility and an automobile repair shop with a gasoline tank are located west across Tiffany Street.
1977, 1978, 1979, 1980, 1981, 1983, 1985, 1986, 1989, 1991, 1992, 1993, 1994, 1995, 1996, 1998, 2001, 2002, 2003, 2004, 2005, 2006, and 2007	The City of New York Shelter for Delinquent Children aka Spofford (4-story building with partial basement), built in 1956 is noted on Lot 35. The building is divided into a gymnasium in the north portion of the building, elevators in the center and a 1-story garage on the east side.
	Development of the surrounding area has increased. Additional garages and automobile repair facilities; and candy manufacturing noted west of the Site along Tiffany Street (1978).
	Barretto Street is designated as 'closed' with a fence separating it from the Site.

2.3 Geological Conditions

Based on the lithology recorded from soil borings advanced during the RI, a fill layer consisting of fine to coarse sand, silt, gravel, concrete, brick and asphalt fragments was encountered from grade to approximately seven ft bls (in some locations). The fill layer, where present, was underlain by an approximate 2 to 14-ft thick native, glacial silty-sand and gravel stratum.

Immediately underlying the fill and native overburden, weathered bedrock and schist bedrock was identified across the Site. Weathered bedrock was observed, at most locations, above the competent bedrock at a thickness ranging from approximately 0.5 ft to 10 ft. Bedrock was identified at shallower depths in the northern and central portions of the Site and sloped downward in a southern direction, with the exception of bedrock encountered at RXMW-3. The bedrock surface at this location is lower in elevation compared to the surrounding area, which has been excavated during construction of the existing building basement (former boiler room of Wing F). Competent bedrock surface ranges from approximate elevation 53 ft relative to North American Vertical Datum of 1988 (NAVD88) (five ft bls) to approximately 17 ft NAVD88 (15 ft bls).

According to water-level data collected during the RI, the water table surface at the Site ranges from approximate elevation 23 ft NAVD88 or 8.35 ft bls (RXMW-2) to 53 ft NAVD88 or 4.98 ft bls (RXMW-10), which is relatively consistent with observed changes in bedrock elevation. Groundwater flow direction appears to mimic bedrock topography and the general groundwater flow across the Site is to the south, with the exception of groundwater near the existing building (Wing F), beneath the basement of former boiler room, where bedrock has been removed during previous building construction. Groundwater in this area flows in a southwestern to western direction. A groundwater contour map, based on the data collected during the June 22, 2018 groundwater gauging event, is provided as Figure 4. Water level elevations are summarized on Table 1. Perched water was observed approximately one to two ft bls at RXSB-13/RXSV-8, RXMW-6, RXMW-7 and RXMW-11. RXSB-13/RXSV-8 and RXMW-11 are located in the southwest courtyard, and RXMW-6 and RXMW-7 are located in the southeast courtyard. The perched zone at these locations appeared limited as soil beneath two ft bls at these locations was observed to be dry suggesting poor surface drainage in these areas.

2.4 Contamination Conditions

The following sections describe the results of the RI.

2.4.1 Soil Contamination

A total of 55 soil samples, including three field duplicate soil samples, were collected from 24 soil boring locations and submitted for laboratory analysis as part of the RI. All analytical soil data was compared to the NYSDEC Subpart 375-6 UUSCOs, RRSCOs and PGWSCOs in order to evaluate Site-wide soil quality and to determine contamination in soil.

Laboratory analytical data generated during the RI for soil is summarized in Tables 2 through 6. Soil boring locations with soil sample exceedances of the NYSDEC SCOs are shown on Plate 1. A summary of soil quality results is provided in the below sections.

2.4.1.1 Volatile Organic Compounds in Soil

VOCs were not detected at concentrations exceeding UUSCOs, RRSCOs or PGWSCOs in soil samples collected during the RI or 2017 Phase II ESA. VOCs results are summarized in Table 2 and on Plate 1. However, VOCs were detected in soil at concentration exceeding NYSDEC SCOs during the 2009 investigation completed by LBA, which are summarized on Plate 1. A summary of the 2009 investigation soil exceedances of NYSDEC SCOs are provided below:

- 1,2,4-Trimethylbenzene was detected at concentrations exceeding UUSCOs and PGWSCOs (3.6 mg/kg, respectively) in six soil samples, and at a concentration exceeding RRSCOs (2 mg/kg) in two soil samples with concentrations, ranging from 5.5 mg/kg to 790 mg/kg with the maximum detection in soil sample SB16A_15.5-16.
- 1,3,5-Trimethylbenzene was detected at concentrations exceeding UUSCOs and PGWSCOs (8.4 mg/kg, respectively) and RRSCOs (52 mg/kg) in two soil samples (SB-15A_15-15.5 and SB16A_15.5-16) at concentrations of 53 mg/kg and 180 mg/kg, respectively.
- Ethylbenzene was detected at concentrations exceeding UUSCOs and PGWSCOs (1 mg/kg, respectively) in three soil samples and at a concentration exceeding RRSCOs (41 mg/kg) in one soil sample (SB16A_15.5-16) at concentrations ranging from 2.1 mg/kg to 120 mg/kg, with the maximum detection from soil sample SB16A_15.5-16.
- Naphthalene was detected at concentrations exceeding UUSCOs and PGWSCOs (12 mg/kg, respectively) in two soil samples and at a concentration exceeding RRSCOs (100 mg/kg) in one soil sample (SB16A_15.5-16) at concentrations ranging from 85 mg/kg to 390 mg/kg, with the maximum detection from soil sample SB16A_15.5-16.
- N-Butylbenzene was detected at concentrations exceeding NYSDEC UUSCOs and PGWSCOs (12 mg/kg, respectively) in three soil samples at concentrations ranging from 13 mg/kg to 60 mg/kg.

- N-Propylbenzene was detected at concentrations exceeding UUSCOs and PGWSCOs (3.9 mg/kg, respectively) in four soil samples and at a concentration exceeding RRSCOs (100 mg/kg) in one soil sample (SB16A_15.5-16) at concentrations ranging from 5.6 mg/kg to 110 mg/kg, with the maximum detection from soil sample SB16A_15.5-16.
- Sec-Butylbenzene was detected at concentrations exceeding NYSDEC UUSCOs and PGWSCOs (11 mg/kg, respectively) in two soil samples (SB-15A_15-15.5 and SB16A_15.5-16) at a concentration of 18 mg/kg and 68 mg/kg, respectively.
- Toluene was detected at concentrations exceeding UUSCOs and PGWSCOs (0.7 mg/kg, respectively) in four soil samples and at a concentration exceeding RRSCOs (100 mg/kg) in one soil sample (SB16A_15.5-16) at concentrations ranging from 0.8 mg/kg to 120 mg/kg, with the maximum detection from soil sample SB16A_15.5-16.
- Xylenes (total) were detected at concentrations exceeding UUSCOs (0.26 mg/kg) in eight soil samples, at a concentration exceeding PGWSCOs (1.6 mg/kg) in five soil samples and at concentrations exceeding RRSCOs (100 mg/kg) in two soil samples with concentrations, ranging from 0.29 mg/kg to 730 mg/kg, with the maximum detection in soil sample SB16A_15.5-16.

2.4.1.2 Semivolatile Organic Compounds in Soil

SVOCs, primarily PAHs, that were detected in soil at concentrations exceeding NYSDEC SCOs during the RI are summarized in Table 3 and on Plate 1. Additionally, SVOC detected in soil at concentrations exceeding NYSDEC SCOs during the 2009 investigation and 2017 Phase II ESA are included on Plate 1. A summary of the SVOC soil exceedances of NYSDEC SCOs are provided below:

- Benzo(a)anthracene was detected at concentrations exceeding NYSDEC UUSCOs, RRSCOs and PGWSCOs (1 mg/kg, respectively) in one soil sample (RXSB-13_0-2) during this RI, three samples during the 2017 Phase II ESA and two samples during the 2009 investigation at concentrations ranging from 1.2 mg/kg to 28 mg/kg , with the maximum detection in soil sample SB20A_17-17.5.
- Benzo(a)pyrene was detected at concentrations exceeding NYSDEC UUSCOs and RRSCOs (1 mg/kg, respectively) in one soil sample (RXSB-13_0-2) during the RI, two soil samples during the 2017 Phase II ESA and two soil samples during the 2009 investigation concentrations ranging from 1.3 mg/kg to 25 mg/kg, with the maximum detection in soil sample SB20A_17-17.5.
- Benzo(b)fluoranthene was detected at concentrations exceeding NYSDEC UUSCOs and RRSCOs in one soil sample (RXSB-13_0-2) at a concentration of 1.7 mg/kg compared to 1 mg/kg (UUSCOs and RRSCOs, respectively).
- Chrysene was detected at concentrations exceeding NYSDEC UUSCOs and PGWSCOs in one soil sample (RXSB-13_0-2) at a concentration of 1.3 mg/kg compared to 1 mg/kg (UUSCOs and PGWSCOs, respectively).
- Indeno(1,2,3-c,d)pyrene was detected at concentrations exceeding NYSDEC UUSCOs and RRSCOs in two soil samples (RXMW-5_0-2 and RXSB-13_0-2) at a concentration of 0.52 mg/kg and 0.78 mg/kg, respectively, compared to 0.50 mg/kg (UUSCOs and RRSCOs, respectively).

2.4.1.3 Metals in Soil

Metals that were detected in soil at concentrations exceeding NYSDEC SCOs during this RI are summarized in Table 4 and on Plate 1. Metals exceeding NYSDEC SCOs during the Phase II ESA are included on Plate 1. A summary of the soil exceedances of NYSDEC SCOs are provided below:

- Arsenic was detected at concentrations exceeding UUSCOs (13 mg/kg) in seven soil samples, and at concentrations exceeding RRSCOs/PGWSCOs (16 mg/kg, respectively) in six soil samples during this RI, ranging in concentration from 14.1 mg/kg to 55.7 mg/kg, with the maximum detection in soil sample RXSB-17_0-2. Arsenic was detected at concentrations exceeding UUSCOs (13 mg/kg) and RRSCOs/PGWSCOs (16 mg/kg, respectively) in one soil sample (RXSB-2_0-2) during the 2017 Phase II ESA at a concentration of 18 mg/kg.

- Barium was detected at a concentration exceeding UUSCOs (350 mg/kg) in six soil samples, and at a concentration exceeding RRSCOs/PGWSCOs (400 mg/kg and 820 mg/kg, respectively) in four soil sample, ranging in concentration from 379 mg/kg to 855 mg/kg, with the maximum detection of 855 mg/kg in soil sample RXSB-16_1-3.
- Beryllium was detected at a concentration exceeding UUSCOs (7.2 mg/kg) in one sample (RXSB-16_1-3), with a concentration of 20.2 mg/kg.
- Hexavalent chromium was detected at concentrations exceeding UUSCOs (1 mg/kg) in one soil sample (RXMW-2_13-15), but did not exceed RRSCOs or PGWSCOs, at a concentration of 1.1 mg/kg.
- Total chromium was detected at concentrations exceeding UUSCOs (30 mg/kg) in 23 soil samples, and at a concentration exceeding RRSCOs (180 mg/kg) in one sample (RXSB-16_1-3), ranging in concentration from 30.1 mg/kg to 344 mg/kg, with the maximum detection in soil sample RXSB-16_1-3.
- Copper was detected at concentrations exceeding UUSCOs (50 mg/kg) in 30 soil samples, at concentrations exceeding RRSCOs (270 mg/kg) in 11 soil samples, and at concentrations exceeding PGWSCOs (1,720 mg/kg) in two samples during this RI, ranging in concentration from 53.8 mg/kg to 4,840 mg/kg, with the maximum detection in soil sample RXSB-16_1-3. Copper was detected at concentrations exceeding UUSCOs (50 mg/kg) in three samples during the 2017 Phase II ESA, ranging in concentration from 64 mg/kg to 190 mg/kg, with the maximum detection in soil ample RXSB-6_0-2.
- Lead was detected at concentrations exceeding UUSCOs (63 mg/kg) in 25 soil samples, at concentrations exceed RRSCOs (400 mg/kg) in six soil samples, and at concentrations exceeding PGWSCOs (450 mg/kg) in five soil samples during this RI, ranging in concentration from 64 mg/kg to 4,010 mg/kg, with the maximum detection in soil sample RXSB-16_1-3. Lead was detected at concentrations exceeding UUSCOs (63 mg/kg) in two samples (RXSB-4_0-2 and RXSB-6_0-2) during the 2017 Phase II ESA, at a concentration of 46 mg/kg and 150 mg/kg, respectively.
- Mercury was detected at concentrations exceeding UUSCOs (0.18 mg/kg) in two soil samples, at a concentration of 0.34 mg/kg (RXMW-2_0-2) and 0.65 mg/kg (RXSB-13_0-2).
- Nickel was detected at concentrations exceeding UUSCOs (30 mg/kg) in 24 soil samples, at a concentration exceeding RRSCOs (310 mg/kg) in one sample, and at a concentration exceeding PGWSCOs (130 mg/kg) in one sample, ranging in concentration from 30.1 mg/kg to 487 mg/kg, with the maximum detection in soil sample RXSB-16_0-2.
- Zinc was detected at concentrations exceeding UUSCOs (109 mg/kg) in 27 soil samples, at a concentration exceeding RRSCOs (10,000 mg/kg) in one sample, and at concentrations exceeding PGWSCOs (2,480 mg/kg) in seven during this RI, ranging in concentration from 114 mg/kg to 36,000 mg/kg, with the maximum detection in soil sample RXSB-16_1-3. Zinc was detected at concentrations exceeding UUSCOs (109 mg/kg) in six soil samples during the 2017 Phase II ESA, ranging in concentration from 120 mg/kg to 1,200 mg/kg, with the maximum detection in soil sample RXSB-6_0-2.

2.4.1.4 Polychlorinated Biphenyls in Soil in Soil

PCBs were not detected in soil samples collected during the RI. PCB results are summarized in Table 5.

2.4.1.5 Pesticides and Herbicides in Soil

Pesticides and herbicides that were detected in soil at concentrations exceeding NYSDEC SCOs are summarized in Table 6 and on Plate 1. A summary of the soil exceedances of NYSDEC SCOs are provided below:

- 4,4'-DDT was detected at concentrations exceeding UUSCOs (0.0033 mg/kg) in four soil samples during this RI and two soil samples during the 2017 Phase II ESA, but did not exceed RRSCOs or PGWSCOs, ranging in concentration from 0.0037 mg/kg to 0.513 mg/kg, with the maximum detection in soil sample RXSB-5_5-6.
- 4,4'-DDD was detected at concentrations exceeding UUSCOs (0.0033 mg/kg) in two soil samples (RXSB-4_0-2 and RXSB-5_5-6) during the 2017 Phase II ESA, but did not exceed RRSCOs or PGWSCOs, at a concentration of 0.00457 mg/kg and 0.0616 mg/kg, respectively.

- 4,4'-DDE was detected at a concentration exceeding UUSCOs (0.0033 mg/kg) in one soil sample (RXSB-5_5-6) during the Phase II ESA, but did not exceed RRSOCs or PGWSCOs, at a concentration of 0.0766 mg/kg.

2.4.2 Groundwater Quality

A total of 17 groundwater samples and one field duplicate sample were collected from 17 monitoring wells and submitted for laboratory analysis as part of the RI. All analytical groundwater data was compared to NYSDEC AWQSGVs, as noted in the RIWP, in order to evaluate groundwater quality and to determine the contamination in groundwater, if present.

Laboratory analytical data generated during the RI for groundwater is summarized in Tables 7 through 12. Monitoring well locations with groundwater sample exceedances of AWQSGVs are shown on Plate 2.

A summary of groundwater quality results is provided in the below sections.

2.4.2.1 Volatile Organic Compounds in Groundwater

VOCs that were detected in groundwater at concentrations exceeding NYSDEC AWQSGVs are shown in Table 7 and on Plate 2. A summary of the groundwater exceedances of NYSDEC AWQSGVs for VOCs are:

- Ethylbenzene was detected at a concentration exceeding NYSDEC AWQSGV in two groundwater samples, with a concentration of 6.8 µg/L (MW-2) and 10 µg/L (MW-1), compared to 1 µg/L (NYSDEC AWQSGV).
- Chloroform was detected at a concentration exceeding NYSDEC AWQSGV in one groundwater sample, with a concentration of 7.3 µg/L (RXMW-1), compared to 7 µg/L (NYSDEC AWQSGV).
- Isopropylbenzene was detected at a concentration exceeding NYSDEC AWQSGV in one groundwater sample, with a concentration of 6.1 µg/L (MW-2), compared to 5 µg/L (NYSDEC AWQSGV).
- MTBE was detected at a concentration exceeding NYSDEC AWQSGV in one groundwater sample, with a concentration of 67 µg/L (RXMW-6), compared to 10 µg/L (NYSDEC AWQSGVs)

2.4.2.2 Semivolatile Organic Compounds in Groundwater

SVOCs, including 1,4-dioxane, detected in groundwater are summarized in Table 8. As shown, there were no SVOC detections exceeding NYSDEC AWQSGVs.

2.4.2.3 Metals in Groundwater

Metals that were detected in groundwater at concentrations exceeding NYSDEC AWQSGVs are shown in Table 9 and Plate 2. A summary of the groundwater exceedances of NYSDEC AWQSGVs for metals are:

- Iron was detected at concentrations exceeding NYSDEC AWQSGVs in five filtered groundwater samples, ranging in concentration from 850 µg/L to 1,770 µg/L compared to 300 µg/L (AWQSGV), with the maximum detection in monitoring well MW-1. Iron is considered a naturally occurring metal and likely a natural component of groundwater.
- Magnesium was detected at concentrations exceeding NYSDEC AWQSGVs in five filtered groundwater samples, ranging in concentration from 35,900 µg/L to 56,300 µg/L compared to 35,000 µg/L (AWQSGV), with the maximum detection in monitoring well MW-6. Magnesium is considered a naturally occurring metal and likely a natural component of groundwater.
- Manganese was detected at concentrations exceeding NYSDEC AWQSGVs in nine filtered groundwater samples, ranging in concentration from 482 µg/L to 632 µg/L compared to 300 µg/L (AWQSGV), with the maximum detection in monitoring well RXMW-10.

- Sodium was detected at concentrations exceeding NYSDEC AWQSGVs in 12 filtered groundwater samples, ranging in concentration from 22,000 µg/L to 206,000 µg/L compared to 20,000 µg/L, with the maximum detection in monitoring well RXMW-5.

2.4.2.4 PCBs in Groundwater

Table 10 presents a summary of PCB analytical data collected during the RI. As shown, PCBs were not detected above laboratory reporting limit in any groundwater sample collected during the RI.

2.4.2.5 Pesticides and Herbicides in Groundwater

Table 11 presents a summary of pesticide and herbicide analytical data collected during the RI. As shown, pesticides and herbicides were not detected above laboratory reporting limit in any groundwater sample collected during the RI.

Aldrin was detected in the field blank sample (FB-062118) collected on June 21, 2018, at a concentration of 0.044 µg/L, exceeding NYSDEC AWQSGV (0.002 µg/L). However, this detection is anomalous as Aldrin was not detected in any soil sample or groundwater sample during the RI.

2.4.2.6 PFAS in Groundwater

Table 12 presents a summary of PFAS analytical data collected during the RI. As shown, a total of 13 PFAS were detected in groundwater. There are currently no NYSDEC groundwater standards for PFAS. A sample preparation data entry error was discovered by TestAmerica, which resulted in the reporting of high-biased results for PFAS analysis for sample RXMW-7. The date proved in Table 13 and below includes the revised PFAS data for RXMW-7 provided in the analytical report dated October 19, 2018 (Appendix E). A summary of the PFAS detections in groundwater is:

- 8:2-FTS was detected in one groundwater sample at a concentration of 0.69 ng/L (RXMW-2).
- PFBA was detected in all four groundwater samples at concentrations ranging from 19.3 ng/L (RXMW-2) to 35.1 ng/L (RXMW-7).
- PFBS was detected in all four groundwater samples at concentrations ranging from 2.2 ng/L (RXMW-2) to 5.76 ng/L (RXMW-4 DUP).
- PFDA was detected in three groundwater samples at concentrations ranging from 0.37 ng/L (RXMW-2) to 0.52 ng/L (RXMW-7).
- PFHpA was detected in all four groundwater samples at a concentration ranging from 2.38 ng/L (RXMW-2) to 17.7 ng/L (RXMW-4 DUP).
- PFHpS was detected in one groundwater sample at a concentration of 5.01 ng/L (RXMW-4).
- PFHxA was detected in all four groundwater samples at concentrations ranging from 2.29 ng/L (RXMW-2) to 12 ng/L (RXMW-7).
- PFHxS was detected in all four groundwater samples at concentrations ranging from 3.03 ng/L to 15 ng/L (RXMW-4/RXMW-4 DUP).
- PFNA was detected in all four groundwater samples at concentrations ranging from 1.32 ng/L (RXMW-4 DUP) to 3.01 ng/L (RXMW-7).
- PFOA was detected in all four groundwater samples at concentrations ranging from 12.3 ng/L (RXMW-2) to 64.9 ng/L (RXMW-4).
- PFOS was detected in all four groundwater samples at concentrations ranging from 10.9 ng/L (RXMW-2) to 28.3 ng/L (RXMW-7).
- PFPeA was detected in all four groundwater samples at concentrations ranging from 4.4 ng/L (RXMW-2) to 37.3 ng/L (RXMW-7).

- PFUnA was detected in two groundwater samples at a concentration of 0.25 ng/L and 0.31 ng/L in RXMW-2 and RXMW-7, respectively.

2.4.3 Soil Vapor Quality

A total of nine soil vapor samples and four sub-slab soil vapor samples were collected and submitted for laboratory analysis as part of the RI.

Laboratory analytical data generated during the RI for soil vapor is summarized in Table 13. Soil vapor and sub-slab soil vapor monitoring point locations with soil vapor sample detections are shown on Plate 3.

A summary of soil vapor quality results is provided below. Analytical data for soil vapor VOCs indicate that there were detections of 32 different VOCs across the Site, including petroleum-related and chlorinated compounds.

As shown in Table 13, approximately 60% of the maximum concentrations of VOCs detected in soil vapor were detected from soil vapor samples located on Tiffany Street sidewalk. The following four compounds are discussed because they are either contaminants of concern (COCs) at the Site (namely petroleum-related compounds) or due to their presence on the NYSDOH Guidance Soil Vapor Matrices. Matrix A provides guidance relative to 1,1-DCE, carbon tetrachloride, and TCE; and Matrix B provides guidance relative to PCE. No indoor air samples were collected as part of the RI; therefore, no direct comparison is made to the NYSDOH Matrices. A summary of the detections is described below. Additional compounds detected besides those noted below are included in Table 13.

Petroleum-Related Compounds

- Benzene was detected in four soil vapor samples, ranging in concentration from 1.5 µg/m^3 and 6.0 µg/m^3, with the maximum concentration detected from sample RXSV-11.
- Ethylbenzene was detected in in two soil vapor samples, RXSV-12 and RXSV-13 (Located in Tiffany Street sidewalk), at a concentration of 57 µg/m^3 and 2.2 µg/m^3, respectively.
- Toluene was detected in six soil vapor samples and one sub-slab soil vapor sample, ranging in concentration from 2.9 µg/m^3 to 150 µg/m^3, with the maximum concentration detected in RXSV-14 (located in Tiffany Street sidewalk).
- Xylenes (total) were detected in three soil vapor samples, RXSV-12, RXSV-13 and RXSV-14 (all located in Tiffany Street sidewalk), at a concentration of 340 µg/m^3, 7.4 µg/m^3 and 32 µg/m^3, respectively.
- N-Hexane was detected in three soil vapor samples and one sub-slab soil vapor sample, ranging in concentration from 4.8 µg/m^3 and 2,500 µg/m^3, with the maximum concentration detected in sample RXSS-4.
- 2,2,4-Trimethylpentane was detected in two soil vapor sample and two sub-slab soil vapor samples, ranging in concentration from 5.1 µg/m^3 to 3,800 µg/m^3, with the maximum concentration detected in sample RXSS-4.

Matrix A Compounds

- 1,1-DCE was detected in one soil vapor sample, RXSV-9, at a concentration of 1.6 µg/m^3.
- Carbon Tetrachloride was detected in two soil vapor samples, RXSV-12 and RXSV-13 (located on Tiffany Street sidewalk), at a concentration of 0.56 µg/m^3 and 0.39 µg/m^3, respectively.
- TCE was detected in two soil vapor samples and two sub-slab soil vapor samples, ranging in concentration from 1.2 µg/m^3 and 25 µg/m^3, with the maximum concentration detected in sample RXSS-4.

Matrix B Compounds

- PCE was detected in nine soil vapor samples and one sub-slab soil vapor sample, ranging in concentration from 4.1 µg/m^3 to 46 µg/m^3, with the maximum concentration detected from sample RXSV-12 (located on Tiffany Street sidewalk).

2.4.4 Conceptual Model of Site Contamination

The following section explains the occurrence of contaminant sources and their fate and transport at the Site in the context of the local Site stratigraphy and hydrogeology.

Historical information and previous investigations indicate that historical Site use included a stone cutting yard, automobile garages, office and residential dwelling, and the Spofford Juvenile Detention facility, later renamed as Bridges Juvenile Center. Based on the soil, groundwater, and soil vapor results discussed in Sections 2.4.1, 2.4.2 and 2.4.3, all three media are contaminated at the Site. The spatial distribution of COCs in various media is shown in Plates 1 through 3.

As discussed in Section 2.4.1 and based on the Site-wide detections and exceedances of NYSDEC SCOs, soil at the Site is impacted with metals and some PAHs. Historical operations at the Site suggest Site soils are impacted through inadvertent releases to the subsurface (e.g., known petroleum spill and historic fill), resulting in localized hot-spots in soil (e.g., majority of metals in soil exceeding NYSDEC SCOs were detected in the northeastern courtyard, two locations in the northwestern courtyard and one location in the southeastern courtyard).

There is no potential for additional releases of petroleum products to soil since the Site is vacant, currently under redevelopment and the existing USTs have been emptied.

As discussed in Section 2.4.2 and based on the Site-wide detections and exceedances of NYSDEC AWQSGVs and the presence of separate phase product (petroleum), groundwater at the Site is impacted with metals and VOCs (ethylbenzene, isopropylbenzene, chloroform and MTBE). Groundwater was impacted at the Site through inadvertent releases to Site soils (i.e., recorded fuel oil spill), and the migration of contaminants through unconsolidated soil to Site groundwater.

As discussed in Section 2.4.3, and based on the Site-wide detections, soil vapor at the Site is impacted with VOCs. Soil vapor was impacted at the Site through inadvertent releases to Site soils. Soil vapor at the Site is impacted with petroleum-related VOCs, with the highest concentrations detected in the basement of existing building (former boiler room), where measurable separate phase product was detected in existing monitoring well, MW-5. CVOCs (primarily PCE and TCE) were also detected in soil vapor samples however, detections are relatively low level, with the highest PCE concentration detected in soil vapor sample RXSV-12 (located on Tiffany Street sidewalk) and the highest TCE concentration detected in sub-slab soil vapor sample RXSS-4 (located in the boiler room basement). There is potential for contaminated soil vapor to migrate from the source area into the existing on-Site building since separate phase product exists beneath the building (former boiler room) and adjacent to the building (southeast courtyard) around the existing UST pad.

2.4.5 Description of Areas of Concern

This RAWP addresses sampling of soil, groundwater and soil vapor from the Areas of Concern (AOCs) that have been identified during the RI and previous investigations.

Petroleum Source AOC

As discussed in Section 2.2.1, approximately 2,000 gallons of #2 fuel oil was released to the subsurface from two 12,000-gallon USTs located in the southeast courtyard of the Site (Plate 1). Following notification to the NYSDEC that a release to subsurface soils had occurred, NYSDEC assigned spill case #0812579. Previous investigation results indicated petroleum-related VOCs and SVOCs in soil, separate phase product present in the basement in three borings located closest to the UST vault, and separate phase product present in two exterior borings located east of the UST vault. In 2017, Roux completed a Phase II ESA for the Site. These results indicated several petroleum-related SVOCs were detected in shallow soil (i.e., 0-2 ft bls) and several

petroleum-related VOCs were detected in soil vapor samples throughout the Site. Lastly, the RI completed by Roux in 2018 included the collection of soil samples, installation of monitoring wells, collection of soil vapor monitoring point samples and sub-slab soil vapor point samples. These results indicated petroleum-related SVOCs in soil, petroleum-related VOCs in groundwater, separate phase product present in monitoring wells and petroleum-related VOCs in soil vapor. Based on these investigations, a petroleum source area was identified and is shown on Plate 4.

Historical Fill

The historical fill that covers the Site at depths from grade to bedrock (varying) is characterized by the metals arsenic, barium, beryllium, chromium, copper, lead, nickel and zinc, as well as PAHs that generally exceed the UUSCOs. The locations of these exceedances are shown on Plate 1.

2.4.6 Identification of Standards, Criteria and Guidance

Standards, Criteria and Guidance (SCGs) are promulgated requirements ("standards" and "criteria") and non-promulgated guidance ("guidance") that govern activities that may affect the environment and are used by the NYSDEC at various stages in the investigation and remediation of a site. SCGs incorporate both the concept of "applicable or relevant and appropriate requirements" (ARARs) and the "to be considered" (TBCs) category of non-enforceable criteria or guidance, consistent with USEPA remediation programs. The following table provides a list of SCGs potentially applicable to the Site. Key SCGs are discussed in greater detail below.

Citation	Title	Regulatory Agency
General		
6 NYCRR Part 375	Environmental Remediation Programs	NYSDEC
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response	US Department of Labor, OSHA
29 CFR 1926	Safety and Health Regulations for Construction	US Department of Labor, OSHA
TAGM HWR-4031	Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites	NYSDEC
No Cite	Analytical Services Protocol	NYSDEC
DER-10	Technical Guidance for Site Investigation and Remediation	NYSDEC
Soil		
6 NYCRR Part 375	Environmental Remediation Programs	NYSDEC
CP-51	Soil Cleanup Guidance	NYSDEC
Groundwater		
6 NYCRR Part 700-705	Surface Water and Ground Water Classification Standards	NYSDEC
TOGS 1.1.1	Ambient Water Quality Standards and Guidance Values (AWQSGVs)	NYSDEC
Air		
Air Guide No. 1	Guidelines for the control of toxic ambient air contaminants	NYSDEC
No Cite	Final - Guidance for Evaluating Soil Vapor Intrusion in the State of New York	NYSDOH
Solid Waste		
6 NYCRR 360	Solid Waste Management Facilities	NYSDEC
6 NYCRR 364	Waste Transporters	NYSDEC
Hazardous Waste		

Citation	Title	Regulatory Agency
6 NYCRR Part 371	Identification and Listing of Hazardous Wastes	NYSDEC
6 NYCRR 372	Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities	NYSDEC
6 NYCRR 376	Land Disposal Restrictions	NYSDEC
Site Management		
No Cite	Groundwater Monitoring Well Decommissioning Procedures	NYSDEC

Legend:

SCG:	Standards, Criteria and Guidance
NYCRR:	New York Code of Rules and Regulations
NYSDEC:	New York State Department of Environmental Conservation
NYSDOH:	New York State Department of Health
OSHA:	Occupational Safety and Health Administration
TOGS:	Technical Operational Guidance Series
TAGM HWR:	Technical and Administrative Guidance Memorandum - Hazardous Waste Remediation

SCGs for Soil

SCGs for soil at BCP sites are the numerical soil cleanup objectives presented in Part 375. The soil cleanup objectives are categorized into unrestricted use criteria and restricted use (residential, restricted-residential, commercial, or industrial) criteria, as well as criteria for protection of groundwater and ecological resources (which can also be satisfied by application of the unrestricted use criteria). The applicability of each category of soil cleanup objectives is determined based upon the current and reasonably anticipated future use of the Site, as well as cleanup tracks being evaluated.

The UUSCOs are applicable to the evaluation of a Track 1 cleanup, which will be evaluated in this RAWP as required by DER-10. The RRSCOs are appropriate for the Site based upon the proposed future land use and used for evaluation of a Track 4 cleanup in this RAWP.

SCGs for Groundwater

The "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations," issued by the NYSDEC in June 1998, presents the guidelines that were used to evaluate potential groundwater issues for the Site.

SCG for Soil Vapor

The Final "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," issued by the NYSDOH in October 2006 and updated in May 2017, presents the guidelines that were used to evaluate potential soil vapor intrusion issues for the Site.

2.5 Qualitative Human Health Exposure Assessment

As described in Appendix 3B of DER -10, "The overall purpose of the Qualitative Human Health Exposure Assessment (or the exposure assessment) is to evaluate and document how people might be exposed to site related contaminants, and to identify and characterize the potentially exposed population(s) now and under the reasonably anticipated future use of the site." The following section details the exposure assessment based on data collected during the RI.

2.5.1 Soil Exposure

As described above in Section 2.4.1, soil samples collected during the RI indicated the presence of metals and SVOCs (primarily PAHs) at concentrations above the NYSDEC UUSCOs, RRSCOs and/or PGWSCOs.

Additionally, free-phase product was observed in three monitoring wells during the RI and a smear zone in soil may potentially exist in these locations. An individual could be exposed to these contaminants through direct contact with Site soil/smear zone during ground intrusive work at the Site. Direct contact without the use of proper personal protective equipment (PPE) and personal hygiene measures could lead to dermal contact and incidental ingestion of these compounds. Since the Site will be fully fenced during construction activities, which will include the sidewalk (i.e., off-Site area) along Tiffany Street, and access is controlled, potential contact with Site soil is restricted to remedial and construction contract workers at the Site performing ground intrusive activities in addition to trespassers and passersby. The general public will not be exposed to direct contact with Site soil since the Site will be fully fenced during construction and times when surficial soil will be exposed. PPE will be required during any intrusive Site work. The only potential for contaminated soil to leave the Site is by dust and mobilization of trucks for off-Site disposal of soil during construction. However, a community air monitoring program (CAMP) will be implemented during intrusive activities to minimize the potential for off-Site exposures from soil/dust leaving the Site. Also, all trucks will be fitted with covers to eliminate the potential for off-Site exposure from soil leaving the Site, and best management practices will be employed to prevent on-Site soil from being tracked out into the public right-of-way.

The proposed plan for Site redevelopment consists of excavation for the construction of a vibrant live-work campus featuring affordable housing, community space, open/recreational space, industrial space, and retail space. The proposed remedy to be described in the RAWP will include addressing impacted soil. Some soil impacted above SCOs and a potential smear zone may remain in-place. However, portions of the Site will be excavated to bedrock and the majority of the Site will be covered by buildings, concrete sidewalks, asphalt parking, etc., therefore, the potential for exposure by direct contact with remaining contaminated soil, including potential smear zone, if any, will be minimized for both the public and any future construction workers performing ground intrusive activities at the Site.

2.5.2 Groundwater Exposure

As described above in Section 2.4.2, groundwater samples collected during the RI indicated the presence of metals, and VOCs (chloroform, ethylbenzene, isopropylbenzene and MTBE) at concentrations above the NYSDEC AWQSGVs and separate phase product was observed in three groundwater monitoring wells at the Site. While not currently occurring, groundwater contamination could eventually migrate off-site. The proposed development and remediation will effectively eliminate all source areas by removing separate phase product, USTs, and source-contaminated soil, thereby eliminating continued impact to groundwater, and the potential for off-site migration to affect the existing neighboring residential, community, and commercial uses.

Furthermore, groundwater is not used for drinking or other potable purposes (the area is connected to the public water supply), and there is no direct contact with or ingestion of groundwater by the general public from existing neighbouring residential, community and commercial uses. CAMP will be implemented during intrusive activities to minimize the potential for off-Site exposures from vapors potentially volatizing from contaminated groundwater. Furthermore, no public water supply wells are located in the area surrounding the Site.

Individuals who perform intrusive work (i.e., utility construction and/or repair), perform groundwater sampling or remedial activities may come into contact with contaminated groundwater. Proper PPE and personal hygiene measures will be required to prevent dermal contact and the potential for incidental ingestion of these compounds.

The proposed on-Site buildings will be serviced by the public water supply. The proposed remedy to address contaminants in Site groundwater will be removal of the petroleum-related source area (UST removal and petroleum-contaminated soil), dewatering during excavation activities and the use of in-situ chemical oxidation (ISCO) below the excavation limits if the UUSCOs cannot be achieved. Based on this, the potential for public exposure by direct contact with contaminated groundwater will be reduced or eliminated.

2.5.3 Soil Vapor Exposure

As described above in Section 2.4.3, soil vapor samples collected during the RI indicated the presence of petroleum-related VOCs and CVOCs. Presently the Site is vacant, with building demolition occurring as part of the IRM activities, therefore, there is no current potential for soil vapor intrusion.

Individuals who perform intrusive work, perform soil vapor sampling or remedial activities may come into contact with contaminated soil vapor. Potential worker exposure to contaminated soil vapor during sampling and/or remediation and redevelopment activities will be mitigated through the implementation of the HASP, proper PPE and personal hygiene measures. CAMP will be implemented during all intrusive activities to minimize the potential for off-Site exposure from potentially contaminated soil vapor. Also, a roaming PID will be used to monitor work safety during all invasive activities. Vapor suppression may be needed during excavations within the area of observed separate phase product accumulations (i.e., monitoring wells MW-3, MW-4 and MW-5).

There is a potential for vapor intrusion into newly constructed buildings and off-Site structures. However, the proposed remedy will include excavating all impacted soil and the use of ISCO below the excavation limits if the UUSCOs cannot be achieved to treat contaminated groundwater. In the event that Site logistics limit extent of excavation, all source material will be removed, and some soil impacted above SCOs may remain in-place. However, the Site will be largely excavated, and the majority of the Site will be covered by buildings, concrete sidewalks, asphalt parking, etc., therefore, the potential for exposure by direct contact with remaining contaminated soil, if any, will be minimized for both the public and any future construction workers performing ground intrusive activities at the Site.

2.5.4 Exposure Assessment Summary

The following table summarizes the exposure assessment.

Environmental Media and Exposure Route	Human Exposure Assessment
Direct contact with subsurface soils (and incidental ingestion)	• Demolition, construction and remedial contractors can come into contact with soil if they complete ground intrusive work at the Site. • During remediation, remedial workers, trespassers, passers-by, and utility workers could come into contact with contaminated soil contained in dust through inhalation, incidental ingestion and dermal contact. This potential exposure will be mitigated through the implementation of the HASP and engineering controls. • Future exposure will be eliminated through excavation of contaminated soil and capping of the Site by the newly constructed buildings.
Ingestion of groundwater	• Groundwater is not used for drinking water, as the Site will be connected to the public water supply.
Direct contact with groundwater (and incidental ingestion)	• Remedial workers, trespassers, and onsite/offsite utility workers could come into contact with contaminated groundwater through dermal contact and incidental ingestion during ground intrusive work, and groundwater remediation and sampling activities. This potential exposure will be mitigated through the implementation of the HASP and engineering controls. • Future exposure will be reduced or eliminated by excavating contaminated soil that is acting as a source of contamination to groundwater, dewatering during excavation activities and use of ISCO, if UUSCOs are not met.

Environmental Media and Exposure Route	Human Exposure Assessment
Inhalation of air (exposures related to soil vapor intrusion)	• Remedial workers, trespassers, and utility workers may be exposed to contaminated soil vapor within open excavations. This potential exposure will be mitigated through the implementation of the HASP and engineering controls. • Future exposure will be mitigated through the excavation of source area soils and installation of vapor barrier or waterproofing membrane for newly constructed buildings.

2.6 Interim Remedial Measures

The following IRMs have recently been completed or are currently being completed at the Site, in accordance with the Revised-Interim Remedial Measure Work Plan, dated August 6, 2018 and approved by the NYSDEC on August 9, 2018:

- Demolition of the three (3) six-story buildings on-Site that are vacant and their associated sub-grade features; and
- Cleaning, inerting, and temporary closure of two (2) 12,000-gallon, #2 fuel oil USTs.

Removal of the USTs will occur following building demolition as part of the Remedial Action, and therefore, has been incorporated into the final remedy. Detailed information regarding the IRM (e.g., general description of the construction activities, waste disposal documentation, backfill documentation, photos, etc.) will be included in the CCR to be prepared following receipt of all data, the DUSR and all final disposal documentation. The CCR will be submitted within 30 days after building demolition completion.

As part of the demolition activities, but not included in the Revised-Interim Remedial Measure Work Plan, concrete demolition debris will be crushed onsite using a mobile concrete crusher to make the material compactable (5-inch and smaller). Phase I of the demolition activities is complete, with approximately 2,100 cubic yards of concrete crushed and placed in the former building footprint areas along Wings A, B and C (see Plate 2 for locations of the former Wings) as part of temporary Site grading until the remedial work begins. Crushed concrete from Phase II demolition activities will be used to fill in the former building footprint areas along Wings D, E, F and G (Plate 2), also as part of temporary Site grading until the remedial work begins. A demarcation layer of 20-mil polyethylene sheeting will be used to segregate the crushed materials from underlying materials for the Phase II work. Crushed concrete placed as part of the IRM activities will be removed during the remedial work and transported offsite for disposal in accordance with Section 5.5.5. A summary of the concrete crushing, reuse onsite and associated offsite disposal will be provided in the CCR.

2.7 Remedial Action Objectives

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been identified for this Site.

2.7.1 Soil

<u>RAOs for Public Health Protection</u>

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatizing from contaminated soil.

<u>RAOs for Environmental Protection</u>

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

2.7.2 Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

2.7.3 Soil Vapor

RAOs for Public Health Protection

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

3. Description of Remedial Action Plan

The following is a detailed description of the alternatives analysis and remedy selection process to address impacted media on the Site.

This section of the RAWP was prepared in accordance with Subpart 375 - 3.8(f), Subpart 375 – 1.8(f), and Section 4.3 of DER-10. As required, a minimum of two remedial alternatives (one being an unrestricted use scenario) are evaluated, as follows:

- One alternative (Remedial Alternative 1) that will achieve unrestricted use relative to on-Site soil (Track 1) without the use of institutional controls (ICs) or engineering controls (ECs); and
- One alternative (Remedial Alternative 2) assuming a restricted use (restricted residential) cleanup scenario for on-Site areas coupled with the use of ICs and ECs (Track 4).

The following is a detailed description of the alternatives analysis and remedy selection process to address impacted media at the Site.

Remedial Alternative 1: Track 1 Unrestricted Use Cleanup (Plate 4):

- Excavation and off-Site disposal of approximately 29,000 cubic yards (cy) of soil (i.e., all soil ["hotspot removal"] exceeding UUSCOs plus 2 feet across the remaining areas) over the entire Site.
- Removal of USTs, fuel dispensers, underground piping or other related structures.
- Collection of excavation sidewall and bottom endpoint samples at a frequency consistent with that presented in DER-10 to document that the SCOs were met.
- Backfill of the Site as necessary for the reconstruction of building foundations with soil meeting UUSCOs.
- ISCO will be implemented to treat contaminants in soil and groundwater below the excavation limits if the UUSCOs cannot be achieved.
- Completion of a soil vapor intrusion evaluation, including the use of a 20-mil vapor barrier or waterproofing membrane to mitigate the potential migration of vapors into the proposed buildings.

Remedial Alternative 2: Track 4 Restricted Residential Cleanup (Plate 5):

- Excavation and off-Site disposal of approximately 4,270 cy of on-site soils as part of redevelopment. Some soil contamination will remain on Site above the UUSCOs.
- Removal of USTs, fuel dispensers, underground piping or other related structures and excavation of source area soils within the UST area.
- Site cover system comprised of asphalt covered parking areas, concrete covered sidewalks/ walkways, concrete building slab and landscaped areas with a minimum of two feet of cover over existing Site soil. A physical demarcation layer, consisting of a 20-mil vapor barrier or waterproofing membrane below the building foundation, the underside of concrete sidewalks/walkways, the underside of asphalt pavement, or orange snow fencing material, filter fabric or equivalent material in landscaped areas will be used to provide a visual reference above residual contamination.
- Completion of a soil vapor intrusion evaluation, including the use of a 20-mil vapor barrier or waterproofing membrane to mitigate the potential migration of vapors into the proposed buildings.
- Implementation of ICs to address remaining contamination above the UUSCOs (including a Site Management Plan and Environmental Easement).

3.1 Evaluation of Remedial Alternatives

The goal of the remedy selection process under the BCP is to select a remedy that is protective of human health and the environment taking into consideration the current, intended, and reasonably anticipated future use of the property. Each remedial alternative is evaluated based on the factors listed below:

- Protection of human health and the environment;
- Compliance with standards, criteria, and guidelines (SCGs);
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance; and
- Land use.

SCGs applicable to the Site remediation are discussed in Section 2.4.6 of this RAWP and described briefly below.

- 6 NYCRR Part 375-6 Soil Cleanup Objectives- The unrestricted use, restricted residential and protection of groundwater SCOs listed in the guidance were used to evaluate soils, delineate areas with impacts, and specify cleanup objectives;
- New York State Groundwater Quality Standards – 6 NYCRR Part 703– 6 NYCRR Subpart 703; the standards listed in the guidance were used to evaluate groundwater quality, delineate areas with impacts, and specify cleanup objects;
- NYSDEC Ambient Water Quality Standards and Guidance Values – TOGS 1.1.1 - the standards listed in the guidance were used to evaluate groundwater quality, delineate areas with impacts, and specify cleanup objects (TOGS 1.1.1 incorporates the same standards as listed in 6 NYCRR Part 703 for the constituents of concern at the Site);
- NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation - May 2010 (or later version if available) - the proposed remedial alternatives were developed in accordance with the abovementioned document;
- NYSDEC Draft Brownfield Cleanup Program Guide – May 2004 - the project is part of the BCP, and as such, the abovementioned guidance document was used to prepare this report;
- NYSDOH Generic Community Air Monitoring Plan - will be required for all ground intrusive activities, and the abovementioned document was used to prepare the CAMP;
- NYS Waste Transporter Permits – 6 NYCRR Part 364 - As the remedial alternatives include excavation and disposal of soil, the abovementioned guidance document applies;
- NYS Solid Waste Management Requirements – 6 NYCRR Part 360 and Part 364 - As the remedial alternatives include excavation and disposal of soil, the abovementioned guidance document applies;
- 6 NYCRR Part 371 – Identification and Listing of Hazardous Waste - As the remedial alternatives include excavation and disposal of potentially hazardous soil, the abovementioned guidance document applies;
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities - As the remedial alternatives include excavation and disposal of potentially hazardous soil, the abovementioned guidance document applies; and

- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York – October 2006, updated May 2017 - the guidance was used to develop the soil vapor sampling program.

3.1.1 Overall Protection of Human Health and the Environment

This criterion is an evaluation of the ability of each alternative or the remedy to protect public health and the environment.

Remedial Alternative 1, Track 1 will be protective of human health and the environment by removing soil at the Site that exceeds the UUSCO and backfilling the area with material meeting the UUSCOs, thus eliminating the potential for human and environmental exposure to contaminated soil once construction is complete and eliminating the risk of contamination leaching from the soil into underlying groundwater. Groundwater is not used for potable purposes, and by removal of the USTs, excavation of all soil that exceeds the SCOs, dewatering and ISCO (if necessary), this alternative will mitigate off-Site migration of impacted groundwater and protect human health and the environment, to the extent practicable. Since all impacted soil and the source area for the groundwater impacts will be removed, use of ICs or ECs is not required. A post-construction vapor intrusion evaluation will be conducted prior to occupancy of any newly constructed buildings. If present, SVI will be addressed by a 20-mil vapor barrier or waterproofing membrane integrated into the building foundation.

Remedial Alternative 2, Track 4 will be protective of human health and the environment by employing ICs and ECs including a Site Cover System (comprised of building slabs/foundations, concrete sidewalks/ walkways, asphalt, or 2 feet of soil meeting SCOs) to prevent exposure to remaining contaminated media following excavation as part of the redevelopment, and installation of a 20-mil vapor barrier or waterproofing membrane. A post-construction vapor intrusion evaluation will be conducted prior to occupancy of any newly constructed buildings. to address the potential for vapor intrusion into future on-Site buildings. A physical demarcation layer will also be used to provide a visual reference above residual contamination. Implementing ICs including a Site Management Plan (SMP) and Environmental Easement will ensure that the Site Cover System remains intact and protective, the Site use is restricted and use of groundwater is restricted.

For both alternatives, during Site remediation and other construction activities, workers may be exposed to impacted soil. Potential worker exposure to soil during remediation activities will be mitigated through the implementation of the Site-specific HASP, which includes the CAMP, and required worker training. Potential environmental exposures will be mitigated by ECs implemented during remedial construction (i.e., dust suppression, odor control and traffic control).

3.1.2 Standards, Criteria, and Guidance

The remedy must conform to officially promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance as appropriate.

Remedial Alternative 1 will achieve compliance with the UUSCOs for all on-Site areas. Removal of soil exceeding UUSCOs, along with removal of the USTs, dewatering and ISCO (if necessary), is expected to result in significant reductions in on-Site groundwater concentrations over time. The handling and management of soils will be in compliance with the applicable SCGs. The excavation will be backfilled with material meeting the Track 1 UUSCOs presented in the Part 375 Regulations. Since all impacted soil and the source area for the groundwater impacts will be removed, the use of ICs or ECs will not be required.

Remedial Alternative 2 will achieve compliance with the Track 4 remedy because no exposed impacted soil will be present after remedial construction, through the use of a Site Cover System (comprised of building slabs/foundations, concrete pavers, or 2 feet of soil meeting SCOs). The Site Cover System will prevent direct contact with remaining on-Site soil. The handling and management of contaminated materials will be in compliance with the applicable SCGs. For groundwater, although the NYSDEC AWQSGVs will not be met, groundwater is not used for potable purposes, and dewatering during excavation, along with removal of USTs and ISCO (if necessary), is expected to improve groundwater concentrations over time.

3.1.3 Long-Term Effectiveness and Permanence

This criterion is an evaluation of the long-term effectiveness and permanence of an alternative or remedy after implementation.

Remedial Alternative 1 removes all soil that was impacted by the historic petroleum releases, removes historic fill exceeding the UUSCOs and removes the limited separate phase product present. Therefore, incremental risk from soil, groundwater, soil vapor, and separate phase product impacts will be eliminated, engineering and ICs are not necessary, and the remedy will continue to meet RAOs in the future, thus providing a permanent long-term solution for the Site.

Remedial Alternative 2 provides a long-term solution for the Site by implementing ICs and ECs to mitigate human health and environmental exposures to impacted soil, groundwater, separate phase product and soil vapor. ECs, including a Site Cover System, and ICs with a SMP and Environmental Easement, will ensure long-term management and use restrictions. The SMP will ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as intended.

3.1.4 Reduction in Toxicity, Mobility, or Volume of Contamination Through Treatment

This criterion is an evaluation of the ability of an alternative or remedy to reduce the toxicity, mobility and volume of site contamination. Preference should be given to remedies that permanently or significantly reduce the toxicity, mobility, or volume of the contamination at the Site.

- removal and/or treatment;
- containment;
- elimination of exposure; and
- treatment of source at the point of exposure.

Remedial alternatives that use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media are preferable.

Remedial Alternative 1 permanently eliminates the toxicity, mobility, and volume of contaminants within the Site by removing all soil with concentrations that exceeded the UUSCOs, UST removal, removing the limited separate phase product present, removing contaminated groundwater during excavation dewatering and treating of residual groundwater impacts with ISCO, if necessary. Removal of impacted soil, separate phase product and groundwater during excavation dewatering is expected to result in significant reductions on on-Site groundwater concentrations over time. In addition, the use of ISCO (if necessary) will further result in the reduction of on-Site groundwater concentrations. Sources of potential impacts to soil vapor are also addressed.

Remedial Alternative 2 will reduce the volume of contaminants on the Site through UST removal and removing the limited separate phase product present, excavation of soil and dewatering required for redevelopment and ISCO (if necessary) and will eliminate exposure through the implementation of ICs and ECs. ECs, including a Site Cover System, and ICs with a SMP and Environmental Easement, will provide a long-term remedy for the Site by eliminating exposure. In addition, the installation of a 20-mil vapor barrier or waterproofing membrane will mitigate the potential for vapor intrusion into future on-Site buildings. The SMP will ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as intended.

3.1.5 Short-Term Impacts and Effectiveness

This criterion is an evaluation of the potential short-term adverse environmental impacts and human exposures during the construction and/or implementation of an alternative or remedy.

Remedial Alternative 1 poses minimal health and environmental risks during implementation. The remedy implementation time (approximately one year) is relatively short and the potential adverse impacts to the community and workers (e.g., increased traffic or exposure to contaminants during soil excavation and transportation) can be mitigated with ECs (e.g., dust, odor and traffic controls). Other potential risks include material handling, electrical shock, off-gas vapor inhalation, general trip hazards, and noise. These potential impacts are addressed in the Site-specific HASP and CAMP and the Soil/Materials Management Plan (SoMP), which detail monitoring during the construction and describe ECs to be implemented as necessary (e.g., dust suppression and traffic control).

Remedial Alternative 2 poses minimal health and environmental risks during implementation. The remedy implementation time (approximately one year and six months) is short and the potential adverse impacts to the community and workers (e.g., increased traffic or exposure to contaminants during soil excavation and transportation) can be mitigated with ECs (i.e., dust, odor and traffic controls). Other potential risks include material handling, electrical shock, off-gas vapor inhalation, general trip hazards, and noise. These potential impacts are addressed in the Site-specific HASP and CAMP and the SoMP, which detail monitoring during the construction and describe ECs to be implemented as necessary (e.g., dust suppression and traffic control).

3.1.6 Implementability

This criterion is an evaluation of the technical and administrative feasibility of implementing an alternative or remedy.

The techniques, materials and equipment to implement **Remedial Alternative 1and Remedial Alternative 2** are readily-available and have been proven effective in remediating the contaminants associated with the Site. Standard materials, services, and well-established technologies will be implemented. There are no specific difficulties associated with any of the activities proposed, which utilize standard construction methods.

3.1.7 Cost Effectiveness

This criterion is an evaluation of the overall cost effectiveness of an alternative or remedy.

Cost estimates for each alternative are shown in Tables 14 and 15.

The total cost for **Remedial Alternative 1** is $23,878,143, with no long-term operation, maintenance or monitoring costs.

The total cost for Remedial **Alternative 2** is $8,847,597, with $60,300 per year in annual operation, maintenance, monitoring and reporting costs.

The costs associated with Remedial Alternative 1 are higher than Remedial Alternative 2 due to the additional excavation, backfill materials, and off-Site disposal that will be required to achieve Track 1 UUSCOs. Remedial Alternative 2 includes long term costs associated with maintenance of the Site Cover System and implementation of the SMP Management Plan and groundwater monitoring.

3.1.8 Community Acceptance

This criterion is evaluated after the public review of the remedy selection process as part of the final DER selection/approval of a remedy for a site.

1 Any public comment relative to these criteria will be considered by DER after the close of the public comment period.

2 Documentation of the public comments received is to be consistent with the Citizen Participation Plan (CPP) identified for a remedial program in accordance with applicable DEC policy.

A full evaluation of this criterion cannot be made until after the public comment period is complete, but because the measures to be employed for all alternatives consist of standard construction methods, including

ECs to minimize impacts to the surrounding community, community acceptance of all alternatives is anticipated.

3.1.9 Land Use

This criterion is an evaluation of the current, intended and reasonably anticipated future use of the site and its surroundings, as it relates to an alternative or remedy, when unrestricted levels would not be achieved.

This evaluation has considered reasonably-anticipated future uses of the Site and takes into account:

- current use and historical and/or recent development patterns;
- applicable zoning laws and maps;
- NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law;
- applicable land use plans;
- proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas;
- environmental justice impacts, Federal or State land use designations;
- population growth patterns and projections;
- accessibility to existing infrastructure;
- proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the Site, proximity to flood plains, geography and geology; and
- current ICs applicable to the Site.

Remedial Alternative 1, will render the Site available for unrestricted use following remedial construction, which is consistent with the current zoning and land use.

Remedial Alternative 2, will allow the Site to be used for Restricted Residential, commercial or industrial use, which is consistent with the proposed redevelopment use.

Therefore, both remedial alternatives are consistent with the proposed redevelopment use. In addition, the Site is located with an NYC EDC Food Retail Expansion to Support Health (FRESH) area and is also within the evaluation area for the NYC EDC Hunts Point Vision Task Force. FRESH promotes the establishment and expansion of neighborhood grocery stores in underserved communities. The proposed Site redevelopment meets the goals of the FRESH program through the provision of a grocery store as part of the commercial space. Per the NYC EDC Hunts Point Peninsula website, the Hunts Point Vision Task Force has the following goals with regards to the redevelopment of this south Bronx area (https://www.nycedc.com/project/hunts-point-peninsula):

- **Optimizing Land Use:** Including the redevelopment of brownfields and a special district rezoning that expands opportunities for industrial and large retail uses and strengthens the buffer between residential and noxious industrial uses.
- **Implementing Workforce Solutions:** Including the creation of a permanent Hunts Point Workforce Career Center within the Hunts Point peninsula.
- **Creating Connections:** Including greater access to the waterfront, streetscape enhancements, and intersection improvements for pedestrian safety.
- **Improving Traffic Safety & Efficiency:** Including the development of an alternative fueling facility, implementation of new truck routes and signage, and the reconfiguration of Food Center Drive.

In accordance with the Hunts Point Vision Task Force, the proposed brownfield redevelopment will "optimize land use" on a currently vacant property to provide not only a grocery store and affordable housing but to also provide light industrial space that will be used for food and beverage production, retail, and media/TV production.

3.2 Selection of the Preferred Remedy

The Preferred Remedy for the Site, Remedial Alternative 1, was selected for implementation since it adequately meets each of the evaluation criteria. In summary, the Preferred Remedy for the Site:

- Is protective of public health and the environment;
- Complies with the appropriate Track 1 UUSCOs;
- Provides long-term effectiveness and permanence through source removal of all soil exceeding the Track 1 UUSCOs and treatment of groundwater;
- Eliminates the mobility of impacted material through removal of any source areas and prevents exposure through ECs during the remedial action implementation and construction;
- Provides short-term effectiveness, including minimal impacts to workers or the surrounding neighborhood through the implementation of ECs during construction;
- Is readily implementable; and
- Is compatible with the proposed land use.

The Preferred Remedy for the Site is consistent with the approach for a Track 1 Unrestricted Use scenario, described in the Part 375 Regulations.

3.2.1 Preferred Remedy Land Use Factor Evaluation

A land use factor evaluation of the Preferred Remedy for the Site is provided below based on the following criteria as required by Article 27, Title 14 of the ECL 27-1415.

3.2.1.1 Zoning

The Site is zoned as R6 residential, which allows for residential uses in medium density areas. The zoning of the properties surrounding the Site is primarily R6 residential, manufacturing M1-2 and Commercial C-4.

As depicted in the Land Use Map (Figure 7 in the BCP Application), the redevelopment of the Site is consistent with the local land use in the surrounding area.

3.2.1.2 Applicable Comprehensive Community Master Plans or Land Use Plans

As depicted in the Land Use Map (Figure 7 in the BCP Application), the redevelopment of the Site is consistent with the surrounding community redevelopment plans.

3.2.1.3 Surrounding Property Uses

As described in the BCP application, the property uses surrounding the Site are residential, commercial, light industrial and vacant. Adjacent uses are shown on the Land Use Map provided in the BCP Application, Figure 7.

3.2.1.4 Citizen Participation

Citizen participation will be pursued throughout the remedial process in accordance with the BCP guide and the CPP for the Site.

3.2.1.5 Environmental Justice Concerns

As presented in the BCP application, as established in DEC Commissioner Policy 29 on Environmental Justice (EJ) and Permitting (CP-29), potential EJ areas are 2000 U.S. Census block groups of 250 to 500 households each that, in the 2000 Census had populations that met or exceeded at least one of the following statistical thresholds:

a) At least 51.1% of the population in an urban area reported themselves to be members of minority groups; or

b) At least 33.8% of the population in a rural area reported themselves to be members of minority groups; or

c) At least 23.59% of the population in an urban or rural area had household incomes below the federal poverty level.

The Site is located in a potential environmental justice area (PEJA) according to 2010 census tract data provided by the NYSDEC and available from NYC Census fact finder. The Site's Census Tract (216.02) includes both a sizeable African-American, and Hispanic American population. Approximately 22% of the population is African American and 75% is Hispanic American.

3.2.1.6 Land Use Designations

As presented in the BCP application, there are no federal or state land use designations related to the Site.

3.2.1.7 Population Growth Patterns

As described in the BCP application for the Site, according to population growth patterns and projections, the proposed use of the Site as mixed-use residential, commercial and light industrial development will be supportive of the growing community.

3.2.1.8 Accessibility to Existing Infrastructure

As described in the BCP application for the Site, the Site's location in the Bronx is accessible to existing infrastructure.

3.2.1.9 Proximity to Cultural Resources

As described in the BCP application for the Site, there are no cultural resources, including federal or state historic or heritage sites or Native American religious sites within ½ mile of the Site.

3.2.1.10 Proximity to Natural Resources

As described in the BCP application for the Site, there are no natural resources within ½ mile of the Site.

3.2.1.11 Off-Site Groundwater Impacts

There are no known impacts to off-Site groundwater.

3.2.1.12 Proximity to Floodplains

As described in the BCP application for the Site, based on review of the floodplain maps provided by FEMA, 1221 Spofford Avenue not within a flood zone but is located within ½ mile of 100-year floodplains.

3.2.1.13 Geography and Geology of the Site

The geography and geology of the Site are discussed in Section 2.3.

3.2.1.14 Current Institutional Controls

As described in the BCP application, there are currently no ICs on the property.

3.3 Summary of Selected Remedial Actions

The elements of the Track 1 Unrestricted Use remedy are:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;
   - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
   - Reducing direct and indirect greenhouse gases and other emissions;
   - Increasing energy efficiency and minimizing use of non-renewable energy;
   - Conserving and efficiently managing resources and materials;
   - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
   - Maximizing habitat value and creating habitat when possible;
   - Fostering green and healthy communities and working landscapes with balance ecological, economic and social goals;
   - Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
   - Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier or waterproofing membrane on the foundation to improve energy efficiency as an element of construction.
2. Site monitoring of potential airborne VOCs and particulates in accordance with a NYSDEC-approved CAMP during all ground intrusive and soil handling activities.
3. Collection and analysis of soil samples during a pre-excavation sampling program to pre-determine the required excavation extents necessary to attain Track 1 SCOs.
4. Implementation of dust and odor suppression techniques during all ground intrusive and soil handling activities.
5. Installation of dewatering and water treatment system, if necessary.
6. Excavation and offsite disposal of soil exceeding Track 1 UUSCOs as shown on Plate 1.
   - A total of nine hot spot areas were identified throughout the Site, which exceed Track 1 UUSCOs. Hot spot areas that exceeded Track 1 UUSCOs were identified at the following locations: RXMW-9, RXMW-11, RXSB-3, RXSB-5, RXSB-11/RXMW-10, RXSB-12, RXSB-13, RXSB-14, and RXSB-17. The hot spot areas are shown on Plate 4. At each hot spot area, soil will be excavated to bedrock. Approximately, 1,500 CY of soil is anticipated to be excavated from the hot spot areas for offsite disposal.
7. Removal of USTs and associated piping and closure of petroleum spill in compliance with applicable local, State and Federal laws and regulations.
8. Installation of support of excavation (SOE) as needed for remedial excavations.
9. Implementation of soil erosion and sediment controls.
10. Screening for indications of contamination (by visual means, odor, and monitoring with PID) in all excavated soil during all ground intrusive activities.
11. Collection and analysis of Site-wide endpoint samples to evaluate the performance of the remedy with respect to attainment of Track 1 USCOs. Post-excavation endpoint sampling plan is provided as Plate 6.

12. Onsite reuse of material, including crushed concrete from Site demolition activities, in compliance with the Track 1 SCOs, as needed for backfill. The estimated quantity of soil or other suitable material to be imported into the Site for backfill is 11,230 cy. The estimated quantity of soil/fill expected to be reused/relocated on Site is 1,000 cubic yards but may change depending on excavation extents and development plans.
13. Appropriate offsite disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal.
14. A post-construction soil vapor intrusion (SVI) evaluation will be performed in the new buildings, and—if present—SVI will be addressed by a 20-mil vapor barrier or waterproofing membrane integrated into the building foundation and subgrade parking garage with high exchange ventilation system.
15. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.
16. Submission of a FER that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.
17. Following completion of the remedy and prior to issuance of the Certificate of Completion, in order ensure that groundwater meets AWQSGVs or there has been a bulk reduction in groundwater contamination to asymptotic conditions, groundwater monitoring will be performed in accordance with Baseline Sampling Procedures in included in Section 6.2.
18. In the event that prior to issuance of the Certificate of Completion onsite groundwater cannot be demonstrated during baseline monitoring to meet AWQSGVs or contain only residual contamination demonstrating that there has been a bulk reduction in groundwater contamination to asymptotic conditions, groundwater remediation will be conducted during construction activities via ISCO to treat contaminants in soil and groundwater below the excavation limits, and post-remedial groundwater monitoring to demonstrate the effectiveness of the remedy will be completed.
19. In the event that a Track 1: unrestricted use cleanup is not achieved on any portion of the Site, the following remedial elements will be required and the remedy will achieve a contingency Track 4 restricted-residential cleanup:
    1. Site cover system comprised of asphalt covered parking areas, concrete covered sidewalks/ walkways, concrete building slab and landscaped areas with a minimum of two feet of cover over existing Site soil that exceeds the RRSCO less than 15 feet below grade, or to bedrock if shallower. A physical demarcation layer, consisting of a 20-mil vapor barrier or waterproofing membrane below the building foundation, the underside of concrete sidewalks/walkways, the underside of asphalt pavement, or orange snow fencing material, filter fabric or equivalent material in landscaped areas will be used to provide a visual reference above residual contamination.
    2. An Environmental Easement, including institutional or engineering controls, to prevent future exposure to any residual contamination remaining at the Site will be recorded in the property title records for the Site. A copy of the environmental easement and Site Management Plan will be submitted as part of the FER, including plans for: (1) institutional and engineering controls, (2) monitoring, (3) operation and maintenance and (4) reporting.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the Department-issued Decision Document. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the FER.

4. Remedial Action Program

4.1 Governing Documents

The applicable documents governing the remedial action are described below.

4.1.1 Site Specific Health and Safety Plan (HASP)

The Site-specific HASP is included in Appendix C and the Site-specific CAMP is included as Attachment 6 within the HASP. All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

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

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

The Roux Site Safety Coordinator will be determined prior to implementation of the remedial action. A resume will be provided to NYSDEC prior to the start of remedial construction.

Confined space entry (if necessary) will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses.

4.1.2 Quality Assurance Project Plan (QAPP)

The Quality Assurance Project Plan (Appendix D) includes all procedures to be followed for sampling and analysis. The QAPP includes all requirements outlined in DER-10 Section 2.4.

4.1.3 Construction Quality Assurance Plan (CQAP)

Quality assurance/quality control procedures for all construction activities associated implementation of the remedial action construction are established in the Construction Quality Assurance Plan (CQAP), which is included in this section of the RAWP. The CQAP describes the Site-specific construction quality assurance and control measures that will be performed during remediation that will be implemented at the Site during implementation of the RAWP. The CQAP includes a program for construction observation and testing to verify performance of the remedial construction in accordance with the RAWP.

4.1.3.1 Organization/ Personnel

The implementation of the remedial action construction will be sequenced based on construction requirements, environmental considerations, and logistic limitations posed by the size of the Site and proximity of adjacent structures. The project team is comprised of the Owner/Volunteer (The Peninsula JV, LLC), contractors, and consultants specializing in one or more critical aspects of the project. It is understood by the project team that close coordination and proper sequencing of all activities occurring on the Site will be crucial to the success of the remediation. The project team and associated responsibilities are discussed below. If changes are made the project team, the CQAP will be amended.

4.1.3.2 (Owner/Volunteer) – Site Rehabilitation and Regulatory Interaction

Blaise Rastello, Remediation Oversight and Project Quality Assurance

As Site volunteer, The Peninsula JV, LLC's Project Manager for the Site, Blaise Rastello, will coordinate communications with regulatory agencies and will provide general oversight of all aspects of the remediation. Blaise Rastello will be responsible for the review and submission of all documents, reports, correspondence, etc., required by the RAWP and/or the BCA with the NYSDEC dated November 9, 2017.

The Peninsula JV, LLC's Project Manager will be responsible for community notifications and addressing concerns with the adjacent property owners and local community on all remediation-related issues and will be immediately notified by the on-Site team of any complaints or concerns regarding the work raised by the adjacent property owners and or the general public.

4.1.3.3 General Contractor/ Construction Manager

TBD , Project Quality Control Officer
The General Contractor/ Construction Manager will be responsible for the quality assurance of all of the tasks being implemented. They will confirm that all components of the Site activities are conducted according to the requirements of the RAWP. In addition, they will be responsible for verifying that the daily Site construction activities are in compliance with all of the safety requirements and regulations governing the Site activity, however, each subcontractor is responsible for the health and safety of their own personnel.

4.1.3.4 Roux Environmental Engineering and Geology, D.P.C., P.C. – RAWP and Environmental Monitoring Compliance

Brian Morrissey, P.E. – ***Remedial Engineer/ Quality Assurance Officer***
Dana Hignell – ***Quality Control Project Manager / Site Safety Officer (SSO)***
TBD – ***Field Manager***

Roux will coordinate all Site activities being implemented to achieve the remedial objectives defined in the RAWP and will act as the SSO. Roux will provide continual review of all quality control measures implemented by the contractors to ensure compliance with the Site's remedial objectives and the Site-specific HASP. As such, Roux will provide oversight services for the duration of the remedial activities.

Roux will be responsible for overseeing and documenting the transportation and disposal of contaminated waste and materials generated during the construction (if any), including:

- fill/soil;
- contamination construction debris;
- personal protective equipment and other miscellaneous debris; and
- construction wastewater.

Roux will implement the Site-specific CAMP. Roux will provide ambient air quality monitoring for VOCs and particulates during all intrusive Site activities. CAMP monitoring data will be reported daily to the SSO and will be maintained on-Site. Action level exceedances will be reported to the SSO, The Peninsula JV, LLC project manager and appropriate communication and action taken. All CAMP monitoring records will be included in the overall FER that will be submitted to the NYSDEC and NYSDOH and will include all of the CAMP data collected, daily monitoring station location maps, and copies of the action limit reports (if any). If an action limit report is generated due to VOC exceedances, the NYSDEC and NYSDOH will be notified within 24 hours of the exceedance. A brief summary of CAMP activities, including any action limit reports generated, will be provided in the daily report.

All on-Site quality control persons identified in the CQAP will provide daily briefings and/or reports to Roux on-Site personnel, identifying the tasks completed, the remedial measures achieved, and any other issues of concern. Additionally, Mr. Brian Morrissey, the "Remedial Engineer", a professional engineer licensed in the State of New York, will be responsible for certifying that the remediation construction was completed in substantial conformance with the approved RAWP and/or any NYSDEC-approved field changes.

4.1.3.5 TBD – Soil Remedial Contractor

Personnel To Be Determined, Construction Quality Control
The soil Remedial Contractor is responsible for the excavation of portions of the Site to the required depths, coordination with the General Contractor for disposal of the contaminated excavated materials, contaminated construction and demolition debris and all other contaminated wastes generated, transportation and disposal

of non-contaminated construction and demolition debris (if any), and decontamination of equipment. The primary environmental obligations of the soil Remedial Contractor include safely managing all excavated materials, preventing the contaminated Site soils from leaving the Site, and decontamination equipment, as necessary.

4.1.3.6 Environmental Laboratory

The need for an environmental laboratory is specific to excavated soil waste characterization analysis, end-point sampling and backfill sampling. The potential also exists for chemical-specific air sampling and analysis, though not currently planned. TestAmerica will be utilized for all remediation construction-related analytical requirements. TestAmerica is a NYSDOH ELAP-certified laboratory. All results will be reported in electronic format deliverables prepared in accordance with NYSDEC requirements. Formal laboratory qualifications and QA/QC information packages for TestAmerica and any other analytical laboratories proposed for the project will be submitted to the NYSDEC or disposal facilities, if requested.

4.1.3.7 Surveying Firm

A NYS-licensed surveying firm, will be contracted by The Peninsula JV, LLC to provide lines, grades, boundaries, benchmarks, topographic surveys, as-built drawings, and any other survey work required for the proper execution and documentation of the work as required by the RAWP.

4.1.3.8 Waste Disposal Facilities

Waste from the Site will be transported to appropriately permitted waste disposal facilities. This CQAP will be updated with the names of the facility or facilities, when available. If any is generated, non-impacted construction debris will be transported to a registered construction and demolition disposal facility.

4.1.3.9 Waste Transporter and Disposal Facility Qualifications

As required, a qualifications package will be provided by each vendor contracted to transport waste from the Site to the designated soil disposal facilities and each designated disposal facility. The package shall include the following:

Proof of insurance and all current necessary waste transport permits for the waste type(s) being transported.

Letters of Commitment from all waste haulers and from all transfer, treatment, storage and disposal facilities to be used for the project. The letters of commitment shall specifically identify the types and quantities of waste that the facility will be able to accept, the permit numbers for all facilities at which the waste will be accepted and all waste characterization requirements, if additional to waste characterization samples already collected. In the event that a facility (such as a privately-owned treatment works) is prohibited from issuing a letter of commitment without a sample of the waste, a conditional type letter will be acceptable. Such a conditional letter shall specifically state what types and quantities of waste the facility will accept.

For each waste hauler:

- Name and federal and state identification numbers, as applicable.
- Address.
- Name of responsible contact for the hauler.
- Telephone number for the contact.
- List of types and sizes of all transport vehicles and equipment to be used.
- A description of proposed transportation route, method and procedures for hauling waste material, including type of vehicles that will be used for each type of waste.
- Copies of any and all necessary permits and authorizations for each type of waste transported.

For each transfer, treatment, storage and disposal facility, the Contractor shall submit the following information:

- Facility name and federal and state identification numbers.
- Facility location.
- Name of responsible contact for the facility.
- Telephone number for contact.
- Signed letter of agreement to accept waste.
- Unit of measure utilized at facility for costing purposes.
- Copies of all permits, licenses, letters of approval, and other authorizations to operate, held by the proposed facility as they pertain to receipt, and management of waste derived from this Contract.

4.1.3.10 Construction Quality Control Testing

Implementation of quality control testing and measurement will be performed by the contractors conducting the specific Site tasks. The quality control officers, defined in Section 4.1.3, will be responsible for providing documentation of all testing and measurement results to Roux. Roux will be responsible for verifying that all quality control testing has been conducted in compliance with the RAWP and as specified herein.

Prior to initial quality control testing procedures:

1. Verify that the testing procedures are within the manufacturer's recommendations.
2. Verify that the facilities' testing equipment are available and comply with testing standards.
3. Check testing instrument calibrations against certified standards.
4. Verify the recording forms, including all the test documentation requirements have been prepared.

Specific task-driven testing/certification obligations as they relate to environmental aspects of the project are as follows:

A New York State-licensed surveyor will conduct all of the necessary measurements and provide associated documentation to verify that the excavation limits are achieved.

Excavated soil will require waste characterization analyses prior to disposal. Waste characterization analysis parameters and frequency for waste leaving the Site are determined by the waste disposal facility's acceptance requirements. As required, waste will be tested in accordance with the soil disposal facility's analytical acceptance requirements. Results will be provided to the disposal facility for review.

The CAMP requires continuous real-time monitoring of VOCs and particulates during all intrusive Site activities. This monitoring equipment will be inspected periodically throughout each day to check and manually record the concentrations of VOCs and particulates and to ensure that the equipment is working properly. The equipment will be repaired, recalibrated, or replaced, as necessary. The periodic measurements will be used to identify any potential risks of off-Site migration. This monitoring data will be collected and logged for review daily by Roux and made available for regulatory agency review. Action Limit Reports will be completed to document any and all action level exceedances, as defined in the CAMP.

The HASP requires continuous real-time monitoring of VOCs and particulates in the breathing zone of workers that will potentially be exposed to on-Site contaminants during all intrusive Site activities in order to identify and mitigate potential exposure risks to on-Site workers. This monitoring equipment will be inspected periodically throughout each day to ensure that the equipment is working properly. The equipment will be repaired, recalibrated, or replaced, as necessary.

All testing data will be managed in accordance with the above requirements and will be included in the FER to be prepared by Roux upon completion of all remedial objectives defined in the RAWP.

4.1.3.11 Project Coordination

During implementation of the remedial action construction, progress meetings/conference calls will be conducted periodically to assess the progress of the work, overall progress to date, quality control requirements, environmental and construction health and safety requirements, and future progress expectations. Those in attendance will include representatives from the Volunteer (as required), Contractor, Roux and other subcontractors, as necessary. The NYSDEC and NYSDOH will attend the progress meetings at their discretion. This will provide the opportunity for all Site tasks to be integrated and discussed collectively and provide for coordination of all Site activities to maintain the overall construction schedule. Routine task meetings will also be conducted on an as-needed basis to insure proper communication between the contractors, tradesman, and supervisory personnel.

4.1.4 Soil/Materials Management Plan (SoMP)

The SoMP is included in Section 5.4 of this RAWP.

4.1.5 Erosion and Sediment Controls

The erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control.

As necessary, hay bales will be placed at locations upgradient of excavation areas to control stormwater runoff and surface water from entering or exiting the excavation. Catch basin inlets immediately adjacent to the work area will be protected to prevent disturbed soil from entering. Construction water will be managed in accordance with the SoMP described in section 5.4.

The Site is exempt from the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-15-002) requirement as it is solely serviced by combined sewers. As such, a stormwater pollution prevention plan (SWPPP) is not required.

4.1.6 Community Air Monitoring Plan (CAMP)

All invasive work will be completed in accordance with the CAMP that is included within the HASP in Appendix C.

4.1.7 Contractors Site Operations Plan (SOP)

The Remedial Engineer will review all plans and submittals for this remedial project as they become available (including the anticipated ones listed above and contractor and sub-contractor document submittals) and will confirm that they are in compliance with this RAWP. The Remedial Engineer is responsible to ensure that all document submittals for this remedial project, including future contractor and sub-contractor document submittals, are in compliance with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

4.1.8 Citizen Participation Plan

A certification of mailing will be sent by the Volunteer to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet, (4) a list of recipients (contact list); and (5) a statement that the repository was inspected on (specific date) and that it contained all of applicable project documents.

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing. Fact sheets will be sent electronically by the NYSDEC project manager.

The approved Citizen Participation Plan for this project is attached in Appendix E.

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

New York Public Library - Woodstock
761 East 160th Street, Bronx, NY
Attn: Corey Rodriguez
Phone: (718) 665-6255
Hours: 10AM–7 PM Monday–Thursday
10AM–5 PM Friday–Saturday

Bronx Community Board 2
Dr. Ian Amritt, Chairman
Ralph Acevedo, District Manager
Roland Lopez, Environmental Committee Chairman
1029 E. 163rd Street, Suite 202
Bronx, NY 10459
Phone: (718) 328-9125
Hours: 9am to 5pm, Monday-Friday

NYSDEC Region 2
1 Hunters Point Plaza
Long Island City, New York 11101
Attn: Wendi Zheng
Phone: (718) 482-7541
Hours: (call for appointment)

4.2 General Remedial Construction Information

4.2.1 Project Organization

The soil remedial contractors have not been selected to date. Once established, a listing of key personnel involved in the Remedial Action will be provided to the NYSDEC. A copy of professional profiles for the Project Principal, Remedial Engineer and other key personnel for Roux are presented in Appendix F.

4.2.2 Remedial Engineer

The Remedial Engineer for this project will be Brian Morrissey. 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 remedial program for The Peninsula Redevelopment Project (NYSDEC BCA Index No. C203097-10-17; BCP Site No. C203097). The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

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

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this Remedial Action Work Plan and will certify compliance in the FER.

The Remedial Engineer will provide the certifications listed in Section 11.1 in the FER.

4.2.3 Remedial Action Construction Schedule

A schedule for the major elements of the remedial construction and portions of the redevelopment construction are presented on Table 16.

4.2.4 Work Hours

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

4.2.5 Site Security

Security for the work, equipment, materials, supplies, facilities, personnel, and incidentals will be provided throughout the performance of the work at the Site. The Site will be fully fenced to delineate and secure areas of ongoing remediation activities.

4.2.6 Traffic Control

Construction work is anticipated to occur between 7 A.M. and 6 P.M. from Monday to Friday. The General Contractor may work longer hours and/or weekends, as permitted by the proper authorities. If work beyond these hours or on weekends is required, the proper authorities will be notified. Disturbances to the local community will be minimized to the extent practical.

For any trucking for waste disposal from the Site and for backfill materials into the Site, the proposed truck routes for ingress and egress to the Site are shown in Figure 6.

Truck transport routes to/from the nearest main artery are as follows:

Outbound Route Headed West on Interstate I-278:

1. Head North on Tiffany Street.
2. Turn left onto Bruckner Boulevard.
3. Continue on Bruckner Boulevard and merge onto i-278 West.

Inbound Route To Site from the West via I-278:

1. Take I-278 west to Bruckner Boulevard.
2. Turn right onto Leggett Avenue.
3. Follow to Randall Avenue.
4. Turn left onto Tiffany Street (Site is on the right).

All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. These are the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-Site queuing of trucks entering the facility, to the extent practicable; (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 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.

The contractors operating on the Site will be responsible for providing all necessary personnel and materials (i.e., traffic lanes, safety cones, etc.) to control traffic entering and exiting the Site and for coordinating traffic control measures with the New York City Police Department, as necessary. Contractors operating on the

Site shall be responsible for all applicable NYCDOT traffic control and notification requirements and incorporating those elements into this Traffic Control Plan.

4.2.7 Contingency Plan

The Contingency Plan is described in Section 5.4.11.

4.2.8 Worker Training and Monitoring

All general Site workers (as defined in OSHA 1910.120 (e)(3)(i)) that will be involved with earth disturbance activities will have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations (40-Hour HAZWOPER training) and meet the medical surveillance requirements included in the HASP.

4.2.9 Agency Approvals

The Volunteer is addressing all City Environmental Quality Review (CEQR) and State Environmental Quality Review Act (SEQRA) requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

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

A complete list of all local, regional and national governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work is attached in Table 17. This list includes a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone number in that agency. This list will be updated in the FER.

4.2.10 Pre-Construction Meeting with NYSDEC

A project kick-off meeting will be conducted with the Volunteer, Roux, NYSDEC and the selected Contractor prior to the commencement of any intrusive remedial activities proposed in this RAWP.

4.2.11 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in Table 18. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency. Since the contractors have not yet been selected, the emergency contact list will be updated prior to the start of work.

4.2.12 Remedial Action Costs

The total estimated cost of the Remedial Action is $23,878,143 with no annual operation, maintenance, monitoring and reporting costs. An itemized and detailed summary of estimated costs for all remedial activity is attached on Table 14.

4.3 Site Preparation

4.3.1 Mobilization

Mobilization and Site preparation activities include:

1. Mobilization of equipment to the work area.
2. Installation of temporary fencing and traffic barricades to delineate the work zone and act as a work site security measure.
3. Implementation of erosion and sediment control measures in accordance with the SWPPP.
4. Set-up of decontamination facilities, which are expected to be limited due to the nature of the project.

4.3.2 Erosion and Sedimentation Controls

Since the area of disturbance will exceed one acre, a SWPPP is required. The SWPPP will be prepared under a separate cover and submitted to the NYSDEC. Catch basin inlets immediately adjacent to the work area will be protected to prevent disturbed soil from entering and any soil spilled on the sidewalk or street immediately adjacent to the Site will be promptly removed and the street will be cleaned.

4.3.3 Stabilized Construction Entrance(s)

Stabilized construction entrances will be installed at the egress points from the Site. Any soil spilled on the sidewalk or street immediately adjacent to the Site will be promptly removed and the street will be cleaned.

4.3.4 Utility Marker and Easements Layout

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

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. Existing utilities have been terminated in anticipation of demolition. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

4.3.5 Structural Stability

The preferred remedy does not include any elements that would impact structural stability of any adjacent structures. However, it is understood that appropriate management of structural stability of off-Site structures during on-Site activities including excavation, if any, is the sole responsibility of the Volunteer and its contractors. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan. The Volunteer and its contractors must obtain any local, State or Federal permits or approvals that may be required to perform work under this Plan. Further, the Volunteer and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved Plan.

4.3.6 Equipment and Material Staging

Equipment and materials for the remedial construction will be on-Site in a designated area.

4.3.7 Decontamination Area

Dry decontamination will be employed to the extent practical, within a designated area of the Site. Water generated during decontamination, if any, will be containerized, characterized and disposed of off-Site in accordance with applicable regulations.

4.3.8 Site Fencing

The Site is currently fully enclosed with chain-link fencing and construction noise-dampening fence wall. The fence wall will be lined with quilted fiberglass to improve sound absorption and reduce construction noise levels at surrounding residential properties. This fencing will be maintained throughout the completion of the remedial action and redevelopment.

The fences and gates will be closed and locked when there is no activity on the Site and any breaks or gaps will be repaired immediately. Temporary fencing (e.g., cones, caution tape, etc.) will supplement the perimeter fencing to delineate and secure the area of ongoing remediation activities within the Site such as soil stockpiles, and health and safety exclusion zones.

4.3.9 Groundwater Monitoring Well / Soil Vapor Probe Decommissioning

Existing groundwater monitoring wells will either be protected during remediation and development for use in post-remedial monitoring or will be properly decommissioned in accordance with NYSDEC policy CP-43. The only exception to this is if the full length of the well is to be excavated during remediation and development.

Similarly, existing soil vapor probes will be properly decommissioned unless they are to be fully removed during remediation and development or used for post-remedial monitoring.

4.3.10 Demobilization

Demobilization from the Site will include:

- Removal and restoration of off-Site equipment and materials storage areas;
- Removal of all fencing and barricades;
- Restoration of disturbed access areas to pre-remediation conditions;
- Removal of sediment and erosion control measures and disposal of materials in accordance with acceptable rules and regulations;
- Equipment decontamination, as required; and
- General refuse disposal.

4.4 Reporting

All daily and monthly Reports will be included in the FER.

4.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by the end of each day following the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions; and
- An explanation of notable Site conditions.

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

Daily Reports will include a description of daily activities keyed to an alpha-numeric map (Figure 7) for the Site that identifies work areas. These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public.

The NYSDEC assigned project number will appear on all reports.

4.4.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th of the month following the end of the month of the reporting period and will include:

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

4.4.3 Other Reporting

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the FER.

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

4.4.4 Complaint Management Plan

If an odor or dust complaint is received, the following procedure will be implemented:

1. Work in the affected area will be halted, and the source of odors/dust will be identified.
2. NYSDEC, NYSDOH, and the Volunteer will be notified of the complaint.
3. Nuisance odors may be encountered during excavation at this Site due to COCs at the Site. Nuisance odors, if any, will be abated through covering/containerizing excavated materials, backfilling open excavations in a timely manner; and/or using a foam unit or other appropriate measures.
4. Nuisance dust may be an issue at this Site. Nuisance dust, if any, will be abated through covering/containerizing excavated materials, backfilling open excavations in a timely manner; and/or using water on excavations.
5. Work will resume in the affected area when the nuisance odors/dust have been abated, as determined by the Roux on-Site personnel.

4.4.5 Deviations from the Remedial Action Work Plan

Deviations from the RAWP will be reported to NYSDEC for approval and fully explained in the FER.

5. Remedial Action: Material Removal from Site

The preferred soil remediation alternative is Track 1 cleanup. The remedial action will include the following components:

- UST Removal
- Pre-Excavation Confirmation Sampling
- Excavation of Impacted Soil
- Support of Excavation and Dewatering
- Post-Excavation End-Point Sampling

These elements are described in detail in the sections below.

5.1 Soil Cleanup Objectives

The Soil Cleanup Objectives for this Site are listed in Table 19. The SCOs for this Site are the Track 1 UUSCOs.

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

Tables 2 through 6 summarize all soil samples that exceed the SCOs proposed for this Remedial Action. Plate 2 shows all soil samples that exceed the SCOs proposed for this Remedial Action.

UST closures will, at a minimum, conform to criteria defined in DER-10.

5.2 Pre-Excavation Confirmation Sampling

A pre-excavation confirmation sampling program will be conducted to delineate the limits of soil removal for remedial purposes and simultaneously obtain samples needed to satisfy the disposal facility waste characterization requirements.

A written plan for the pre-excavation sampling program will be submitted to the NYSDEC for review and approval prior to implementation. This plan will include the proposed sampling locations, frequency, methodology, QA/QC and reporting. It is anticipated that waste characterization sampling for remedial disposal or soil reuse will be conducted concurrently with the pre-excavation sampling. Based on the current project schedule, this investigation is planned for the first quarter of 2019, as the building is demolished and access to the Site becomes available.

5.3 Remedial Performance Evaluation (Post-Excavation End-Point Sampling)

End-point sampling and reporting will be conducted in accordance with DER-10 and the Site-specific QAPP and will be used to document that the Track 1 UUSCOs have been met. Proposed post-excavation endpoint sample plan is provided on Plate 6.

5.3.1 End-Point Sampling Frequency

Bottom Sampling

Bottom documentation sampling to represent the quality of soil remaining after excavation is complete will be conducted at a frequency of one sample per approximately 2,000 square feet of excavation area in accordance with the guidance provided in NYSDEC DER-10 5.4 for excavations 20 to 300 feet in perimeter. A total of approximately 85 bottom post-excavation soil samples are proposed to be collected. Documentation samples will be analyzed for the full suite of parameters (VOCs, SVOCs, metals, pesticides/herbicides and PCBs). For excavations that terminate within bedrock, no bottom documentation sampling is proposed.

Sidewall Sampling

For soil excavations of 20 to 300 feet in perimeter, sidewall samples at a frequency of one sample per 30 linear feet (with a minimum of one sample per sidewall) will be collected in accordance with NYSDEC DER-10 Section 5.4. For soil excavations greater than 300 feet in perimeter, sidewall samples will be collected at a frequency of one sample per 100 linear feet. Sidewall samples will be biased towards the areas and depths of highest contamination, either based on previous sampling or visual contamination identified during the remedial action. A total of approximately 67 sidewall soil samples are proposed to be collected.

Documentation samples will be analyzed for the full suite of parameters (VOCs, SVOCs, metals, pesticides/herbicides and PCBs).

UST Sampling

In additional to above, a minimum of five soil samples will be collected, consisting of four sidewalls and one bottom sample for each 15 linear feet of trench for UST areas and associated piping. However, excavations that terminate within bedrock, no bottom documentation sampling is proposed.

The additional documentation samples collected for UST and associated piping will be analyzed for VOCs and SVOCs only.

5.3.2 Methodology

Each sample will be inspected for visual evidence of contamination (i.e., staining, presence of petroleum or odors) and field screened for VOCs using a PID. Soil samples to be submitted for analysis will be placed in a laboratory sample jar and transported to the laboratory in an iced container.

5.3.3 Reporting of Results

The laboratory will report analytical results for end-point samples in ASP Category B deliverable packages. An EDD in the required NYSDEC format will also be provided by the laboratory.

All end-point sample data generated for the Remedial Action will be logged in a database and organized to facilitate data review and evaluation. The electronic dataset will include the data flags provided in accordance with USEPA Laboratory Data Validation Functional Guidelines for Evaluating Organic Analysis and Inorganic Analyses, as well as additional comments of the data review for ASP/CLP analyses. The data flags include such items as: 1) concentration below required detection limit, 2) estimated concentration due to poor recovery below required detection limit, 3) estimated concentration due to poor spike recovery, and 4) concentration of chemical also found in laboratory blank.

5.3.4 QA/QC

Quality assurance (QA) and quality control (QC) samples serve as checks on both the sampling and measurements systems and assist in determining the overall data quality with regard to representation, accuracy, and precision. The QAPP, included as Appendix D to this RAWP, describes QA/QC procedures and sampling for the project.

5.3.5 DUSR

A DUSR will be prepared to evaluate the end-point samples by a party independent from the laboratory performing the analysis in accordance with Appendix 2B of DER-10. The QAPP, included as Appendix D to this RAWP, describes the DUSR to be prepared for the project.

5.3.6 Reporting of End-Point Data in FER

Chemical laboratories used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified. End-point sampling frequency is described in Section 5.3.1. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

5.4 Estimated Material Removal Quantities

On-Site soils which exceed the UUSCOs will be excavated and transported off-Site for disposal. The estimated quantity of soil/fill to be removed from the Site is approximately 29,000 cy of soil across the Site for remedial and redevelopment purposes.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the Site. The estimated quantity of soil or other suitable material to be imported into the Site for backfill is 11,230 cy. The estimated quantity of soil/fill expected to be reused/relocated on Site is 1,000 cubic yards but may change depending on excavation extents and development plans.

5.5 Soil/Materials Management Plan

The following sections provide the Soil/Materials Management Plan to be implemented during the Remedial Action.

5.5.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional or experienced field geologist under the direction of the Remedial Engineer during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy and during development phase, such as excavations for foundations and utility work, prior to issuance of the Certificate of Completion.

All primary contaminant sources identified during the Site Characterization, RI and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the FER.

Screening will be performed by qualified environmental professionals. Resumes will be provided for all personnel responsible for field screening (i.e., those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

5.5.2 Stockpile Methods

Stockpiles, if any, 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 NYSDEC. Stockpiles, if any, will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced. Soil stockpiles, if any, will be continuously encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points. Water will be available on-Site at suitable supply and pressure for use in dust control.

5.5.3 Materials Excavation and Load Out

The Remedial Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. Existing utilities have been terminated in anticipation of demolition. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-Site. The Remedial Engineer will be responsible for ensuring that all outbound trucks will be free of Site soil clinging to their exterior before leaving the Site until the remedial construction is complete. This will be accomplished by examining each truck before it leaves, dry brushing any Site soil from the exterior (if any is present), washing soil from the truck (if necessary) and sweeping any soil from the sidewalk adjacent to the work area.

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

The Remedial Engineer will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site–derived materials.

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

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

All remedial excavation areas will be delineated during the pre-excavation confirmation sampling program. If required, each hotspot and structure to be remediated (USTs, vaults and associated piping, etc.) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure.

Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

Mechanical processing of historical fill and contaminated soil on-Site is prohibited.

All primary contaminant sources (including but not limited to USTs and hotspots) identified during Site Characterization, RI, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. The survey information will be shown on maps to be reported in the FER.

5.5.4 Materials Transport Off-Site

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

Truck transport routes are as described in Section 4.2.6. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed in-bound and out-bound truck routes to the Site are shown in Figure 6. 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 off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the 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 off-site disturbance. Off-Site queuing will be minimized to the extent practical.

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.

Cleaning of trucks prior to exiting the Site is discussed in Section 5.5.3.

5.5.5 Materials Disposal Off-Site

The disposal locations will be determined prior to implementation of the remedial action. Disposal locations established at a later date will be reported to the NYSDEC Project Manager.

The total quantity of material expected to be disposed off-Site is approximately 29,000 cy of soil across the Site for remedial and redevelopment purposes.

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 UUSCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a completed disposal facility application for each receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This application will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The application will provide the project identity. The application will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2.

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360-16 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be Construction and Demolition (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 processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DMM. This material is prohibited from being sent or redirected to a Part 360-16 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-Site or off-Site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The FER will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

Bill of Lading system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER.

Hazardous wastes derived from on-Site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

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

5.5.6 Materials Reuse On-Site

A pre-excavation confirmation sampling program will be conducted prior to excavation activities. Soil acceptance for onsite reuse will be identified based on these sample results. Soil approved for onsite reuse will be temporarily stockpiled in an accessible location onsite and will be kept covered as needed with appropriately anchored tarps to reduce the potential for nuisance dust. Stockpiles will be routinely inspected and damaged tarp covers will be replaced as needed.

Chemical criteria for on-Site reuse of material is listed in Table 20. The Remedial Engineer will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on-Site. Sampling of soil planned for reuse will be conducted in accordance with the QAPP (Appendix D).

As part of the IRM demolition activities, concrete demolition debris will be crushed onsite using a mobile concrete crusher to make the material compactable (5-inch and smaller). Phase I of the demolition activities is complete, with approximately 2,100 cubic yards of concrete crushed and placed in the former building footprint areas along Wings A, B and C (see Plate 2 for locations of the former Wings) as part of temporary Site grading until the remedial work begins. Crushed concrete from Phase II demolition activities will be used to fill in the former building footprint areas along Wings D, E, F and G (Plate 2), also as part of temporary Site grading until the remedial work begins. A demarcation layer of 20-mil polyethylene sheeting will be used to segregate the crushed materials from underlying materials for the Phase II work. Crushed concrete placed as part of the IRM activities will be removed during the remedial work and transported offsite for disposal in accordance with Section 5.5.5. A summary of the concrete crushing, temporary reuse onsite and associated offsite disposal will be provided in the IRM- CCR and FER.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Site.

Contaminated onsite material, including historic fill and contaminated soil, removed for grading or other purposes will not be reused onsite. This will be expressed in the final SMP.

5.5.7 Fluids Management

Construction wastewater will be generated from localized dewatering to reach proposed excavation depths, personnel/equipment decontamination and run-off/run-on in bermed soil stockpile and excavation areas. Construction wastewater will be collected and stored on-Site in leak-tight drums, vacuum trucks or temporary storage tanks. The wastewater will be sampled and submitted for analysis for disposal/discharge

characterization. Based on the laboratory analytical results, the construction wastewater will be disposed off-Site at a permitted disposal/recycling facility or discharged (after treatment, if necessary) to the public sewer system, if approved in writing by the NYCDEP.

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP.

Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed off-Site.

Discharge of water generated during remedial construction to surface waters (i.e. a local pond, stream or river) is prohibited without a SPDES permit.

5.5.8 Demarcation

A Track 1 Unrestricted Use cleanup is anticipated for the Site. In the event that Track 1 is not achieved, after the completion of soil removal and any other invasive remedial activities and prior to backfilling, a land survey will be performed by a New York State licensed surveyor. The survey will define the top elevation of residual contaminated soils, if any remain. If Track 1 is not achieved, a physical demarcation layer, consisting of orange snow fencing material, filter fabric or equivalent material will be placed on this surface to provide a visual reference. This demarcation layer will constitute the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of contaminated residual soils defined in the SMP. The survey will measure the grade covered by the demarcation layer before the placement of cover soils, pavement and sub-soils, structures, or other materials. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the 'Residuals Management Zone' in the SMP. A map showing the survey results will be included in the FER and the SMP.

5.5.9 Backfill from Off-Site Sources

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the Site. Recycled concrete aggregate (RCA) obtained from a NYSDEC registered construction and demolition debris processing facility may be used to finish the excavations to grade, as necessary. Imported RCA that contains less than 10% by weight material which would pass through a size 80 sieve will not require testing. RCA not meeting this criterion will be tested in accordance with DER-10. Documentation of the source of the imported RCA will be provided to NYSDEC in advance of importation.

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

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

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC-approved backfill or cover soil quality objectives are the UUSCOs for Track 1 or lower of the RRSCOs or PGWSCOs for Track 4 as set forth in Table 375-6.8(b) of 6 NYCRR Part 375 and listed in Table 20. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved Remedial Action Work Plan or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this Remedial Action Work Plan should be construed as an approval for this purpose.

Solid waste will not be imported onto the Site.

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

5.5.10 Stormwater Pollution Prevention The Site is exempt from the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-15-002) requirement as it is solely serviced by combined sewers. As such, a stormwater pollution prevention plan (SWPPP) is not required. The erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control.

As necessary, hay bales will be placed at locations upgradient of excavation areas to control stormwater runoff and surface water from entering or exiting the excavation. Catch basin inlets immediately adjacent to the work area will be protected to prevent disturbed soil from entering. Construction water will be managed in accordance with the SoMP described in section 5.5.

5.5.11 Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on product, sediment and surrounding soils, etc. Chemical analytical work will be for full scan parameters (TAL metals; TCL volatiles and semivolatiles, TCL pesticides, herbicides, and PCBs). These analyses will not be limited to STARS parameters where tanks are identified without prior approval by NYSDEC. Analyses will not be otherwise limited without NYSDEC approval.

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. These findings will be also included in daily and periodic electronic media reports.

5.5.12 Community Air Monitoring Plan

The CAMP is included within the HASP in Appendix B.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

5.5.13 Odor, Dust, and Nuisance Control Plan

The FER will include the following certification by the Remedial Engineer: "I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan."

5.5.13.1 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-Site and on-Site. Specific odor control methods to be used on a routine basis will including limiting open excavation areas and covering excavated soil. If nuisance odors are identified, work will be halted, and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Volunteer's Remedial Engineer, who is responsible for certifying the FER.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using 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.

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

5.5.13.2 Dust Control Plan

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

Dust suppression will be achieved through the use of an onsite hydrant for road wetting. Water will be available on-Site at suitable supply and pressure for use in dust control. 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 spraying.

5.5.13.3 Other Nuisances

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

A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to NYCDEP noise control standards.

5.6 UST Removal

Two (2) 12,000-gallon, #2 Fuel Oil USTs remain at the Site. In accordance with the NYSDEC-approved Interim Remedial Measure (IRM) Report dated August 6, 2018, prior to demolition of the buildings and subgrade features, all fluid was removed from the USTs and associated piping rendering them inert to allow for safe demolition of the buildings. After demolition of the existing buildings is complete, permanent closure of the USTs by removal, cleaning and disposal of the USTs will be completed as part of the Remedial Action.

The Fire Department of the City of New York (FDNY)-licensed tank removal contractor will mobilize the necessary labor and equipment to remove the USTs. Removal of the USTs will be completed in general accordance with NYSDEC's DER-10 Section 5.5, NYSDEC's *Permanent Closure of Petroleum Storage Tanks* dated January 20, 1987, as revised December 3, 2003, and the Rules of the FDNY – RCNY Title 3. The scope of work will include:

- Removal of pavement and concrete to access the USTs and piping to be removed;
- Verification that all fluids have been removed from the USTs;
- Rendering the interior of the USTs inert by degassing, if necessary, using either dry ice or nitrogen gas and then testing the tank atmosphere with an oxygen meter;
- Excavation of soil to expose the USTs and facilitate removal;
- Removal of the fill tube and disconnection of the fill, gauge, product and vent lines;
- Temporarily plugging all UST openings, completion of the excavation and removal of the USTs; and
- Cleaning and cutting the USTs into pieces, followed by offsite transportation and disposal.

Upon UST removal, Roux will inspect each of the USTs for damage, corrosion, pitting, holes or other signs of a release. Notes of the inspection will be recorded in a field notebook and photographs of the USTs will be taken. No soil samples will be collected during the UST removal. Contamination observed, if any, during the UST removal will be addressed during the Remedial Action excavation activities.

The management of materials generated during the UST removal will be in accordance with Section 5.5. Excavated soil will be segregated (unsaturated versus saturated) and stockpiled on and covered with polyethylene sheeting until the excavation is completed. The UST excavation sidewalls will be lined with polyethylene sheeting so as to not create a preferential pathway for separate phase product, if encountered, and will be backfilled with RCA obtained from a NYSDEC registered construction and demolition debris processing facility to one foot above the water table. Imported RCA that contains less than 10% by weight material which would pass through a size 80 sieve will not require testing. RCA not meeting this criterion will be tested in accordance with DER-10. Documentation of the source of the imported RCA will be provided to NYSDEC in advance of importation. The remainder of the tank gravel(s) will be backfilled with the unsaturated soil removed during the UST excavation, as appropriate RCA will be used to finish the excavation to grade, as necessary.

Following removal of the USTs, a PBS Application for closure of the tanks, associated documentation and payment will be filed with the NYSDEC PBS Unit. Also, an FDNY Affidavit will be filed by the FDNY licensed tank removal contractor for removal of the USTs.

Detailed information regarding the UST removal (e.g., waste disposal documentation, backfill documentation, photos, etc.) will be included in the FER. Detailed information regarding the temporary UST closure as part of the IRM activities will be included in the CCR, which will be submitted within 30 days after building demolition completion.

6. Engineering Controls: Treatment Systems

6.1 In-Situ Chemical Oxidation Application

If Track 1 UUSCOs are not achieved, or if residual groundwater contamination remains on-site following completion of the remedial excavation activities, ISCO is proposed to address residual groundwater contamination. This work will be timed either in conjunction with or following completion of the excavation activities at the Site, depending on the required application. The proposed remedial action will include either application of the ISCO in the open excavation area prior to backfilling if the Track 1 UUSCOs are not achieved, or injections of ISCO within areas of the Site where groundwater monitoring following excavation activities has determined that residual groundwater contamination exists. Volume and density application rates for the chemical oxidant will be based on the manufacturer's recommendations. A letter from the manufacturer stating recommended dosage will be provided to the NYSDEC and will be included in the FER.

6.2 In-Situ Chemical Oxidation Monitoring

To assess whether ISCO will be required, and to assess the performance of the ISCO injections, a groundwater monitoring program will be established. This will include up to two components: baseline sampling and performance monitoring. The sampling, sample handling, decontamination, and field instrument calibration procedures will be performed in accordance with DER-10 and established procedures for the Site during the RI.

Baseline Sampling

If the Track 1 UUSCOs are not achieved, the results of the groundwater sampling performed during the RI will be considered the baseline sampling round against which remedial progress will be measured. The amount of oxidant proposed to be applied within the excavation area prior to backfilling will be based on the baseline sampling results.

If the Track 1 UUSCOs are achieved, following completion of the excavation activities, two temporary groundwater monitoring wells will be installed hydraulically downgradient of the UST area. The location of the proposed monitoring well will be provided to the NYSDEC prior to installation. Two rounds of baseline groundwater samples will be collected on a semi-annual basis and analyzed for TCL of VOCs using USEPA Method 8260C. If the sample results demonstrate attainment of the AWQSGVs or bulk reduction in groundwater concentrations compared to the RI groundwater results due to UST source area removal and excavation dewatering, ISCO will not be proposed and no further monitoring will be conducted. However, if groundwater concentrations are above the AWQSGVs or bulk reduction has not been demonstrated, an ISCO injection program will be established.

Performance Sampling

If the Track 1 UUSCOs are not achieved and ISCO was applied within the excavation area(s) prior to backfilling, temporary groundwater monitoring well(s) will be installed hydraulically downgradient of the excavation area(s). The quantity and location of the proposed monitoring well(s) will be determined following completion of the excavation activities and will be provided to the NYSDEC prior to installation of the well(s).

Approximately four weeks after the ISCO event, performance monitoring samples will be collected from the newly installed monitoring well(s), based on construction progress. If the sample results demonstrate attainment of AWQSGVs or bulk reduction in groundwater concentrations, no further monitoring will be conducted. The monitoring well(s) will be sampled for TCL of VOCs using USEPA Method 8260C. If the sample results do not demonstrate attainment of AWQSGVs or bulk reduction in groundwater concentrations, additional rounds of performance monitoring and potentially another ISCO event may be conducted, if the construction schedule allows.

6.3 Data Evaluation and Reporting

After the ISCO and performance monitoring have been completed, Roux will evaluate the results of each sampling round to determine the effectiveness of the ISCO at reducing the contaminant concentrations in

groundwater. The evaluation and recommended course of further remedial action, if necessary, will be summarized in a report to the NYSDEC.

7. Criteria for Completion of Remediation/ Termination of Remedial Systems

The remediation will be considered complete when all soil above the UUSCOs is excavated as described in Section 5 and groundwater has been remediated to AWQSGVs or asymptotic bulk reduction of residual groundwater concentrations has been achieved, as documented during the post remediation monitoring described in Section 6. To meet Track 1, a post-construction SVI evaluation will be performed in the new buildings.

If the Track 1 UUSCOs are not met, or it is determined that meeting the Track 1 UUSCOs is not feasible, the contingency for a Track 4: RRSCO plan described below in Sections 8 through 10 will be implemented.

8. Residual Contamination to Remain on-Site

The selected Track 1 remedial alternative is designed to reduce the concentrations of Site contaminants to below the UUSCOs and AWQSGVs (asymptotic bulk reduction of residual groundwater concentrations). If the remedial action is unsuccessful (i.e. soil above the UUSCOs remains on-Site or bulk reduction in groundwater contamination is not achieved), then ECs and ICs would be required to protect human health and the environment under a Track 4 Contingency. These ECs and ICs are described hereafter as a contingency. Long-term management of EC/ICs and of residual contamination will be executed under a Site-specific SMP that will be developed and included in the FER.

ECs will be implemented to protect human health and the environment by appropriately managing residual contamination. The Site will have one primary EC system: a Site cover system.

The FER will report any residual contamination on the Site in tabular and map form.

9. Contingency Plan Engineering Controls: Site Cover System

If the remediation of impacted soil is unsuccessful under a Track 1, exposure to residual contamination will be prevented by a site cover system that will be constructed across the Site as a Track 4 contingency. The cover system will be comprised of the concrete building slab with an integrated 20-mil vapor barrier or waterproofing system around the building foundations, asphalt covered parking areas, concrete covered sidewalks/walkways and landscaped areas with a minimum of two feet of cover over existing soil.

A site plan detailing the layout of the building foundation and vapor barrier or waterproofing components will be provided in the FER. A Soil and Underground Structure Management Plan will be included in the SMP and will outline the procedures to be followed in the event that the cover system and underlying residual contamination are disturbed after the Remedial Action is complete. Maintenance of the site cover system will be described in the SMP.

10. Contingency Plan Institutional Controls

As the preferred remedial alternative consists of Track 1 remedy, institutional controls are not required. If the Track 1 UUSCOs are not met or it is determined that meeting the Track 1 UUSCOs is not feasible, the contingency plan described in Section 9 will be implemented, and ICs will be required. The ICs will require an Environmental Easement imposing Site use limitations and requiring implementation of an SMP under a Track 4 contingency.

The specific requirements of the Environmental Easement and SMP are detailed below.

10.1 Environmental Easement

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Bronx County Office of the City Register as a contingency in the event a Track 1 cleanup is not achieved. The Environmental Easement will be submitted as part of the FER.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement:

1. requires the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
2. allows the use and development of the controlled property for restricted residential (or less restrictive uses) as defined by Part 375-1.8(g), although land use is subject to local zoning laws; and
3. requires compliance with the Department approved Site Management Plan.

The Environmental Easement must be recorded with the Bronx County Office of the City Register before the Certificate of Completion can be issued by NYSDEC. A series of ICs are required under this remedy to implement, maintain and monitor these EC systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted residential (and less restrictive uses defined in 6 NYCRR Part 375) use(s) only. These ICs are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. ICs can, generally, be subdivided between controls that support ECs, and those that place general restrictions on Site usage or other requirements. ICs in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

The ICs that support ECs are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All ECs must be operated and maintained as specified in this SMP;
- A Site Cover System consisting of concrete building slabs, asphalt parking areas, concrete covered sidewalks and walkways, and/or landscaped areas consisting of two feet of cover must be inspected, certified and maintained as required in the SMP;
- All ECs on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;
- Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;
- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
- On-Site environmental monitoring devices, including but not limited to, groundwater monitor wells, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP; and

- ECs may not be discontinued without an amendment or extinguishment of the Environmental Easement.

The above requirements may be modified, added or deleted as warranted by Site conditions and deemed necessary by the NYSDEC.

Adherence to these ICs for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section). The Controlled Property (Site) will also have a series of ICs in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited, with the exception of raised planters;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Controlled Property may be used for restricted residential use (and less restrictive uses defined in 6 NYCRR Part 375) only, provided the long-term Engineering and ICs included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use, such as residential or unrestricted use without an amendment or extinguishment of this Environmental Easement; and
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This annual statement must be certified by an expert that the NYSDEC finds acceptable.

10.2 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the FER and issuance of the Certificate of Completion for the Remedial Action. The SMP is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

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

A Site Management Plan is required, which includes the following:

1. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
    a. Institutional Controls: The Environmental Easement discussed in Section 10.1 above.

b. Engineering Controls: The Site Cover System discussed in Section 9.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use, and groundwater or surface water use restrictions;
- a provision for the evaluation of the potential for soil vapor intrusion for any buildings developed on the Site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
   a. monitoring of the cover system to assess the performance and effectiveness of the remedy;
   b. monitoring for vapor intrusion for any buildings on the Site, as may be required by the Institutional and Engineering Control Plan discussed above; and
   c. a schedule of monitoring and frequency of submittals to the NYSDEC;

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis and summarized in a Periodic Review Report (PRR). The certification period will be annually, unless otherwise approved or modified by the NYSDEC. The PRR will be based on a calendar year and will be due for submission to NYSDEC by March 1 of the year following the reporting period.

The SMP in the FER may include a monitoring plan for groundwater including appropriately placed groundwater monitoring wells downgradient of the ISCO application areas for the purpose of evaluation of the effectiveness of the remedy.

No exclusions for handling of residual contaminated soils will be provided in SMP. All handling of residual contaminated material will be subject to provisions contained in the SMP.

11. Final Engineering Report

An FER will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The FER will include as-built drawings for all constructed elements, calculation and manufacturer documentation for treatment systems, certifications, manifests, bills of lading as well as the complete SMP (formerly the Operation and Maintenance Plan). The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the SMP and Environmental Easement. This determination will be made by NYSDEC in the context of the FER review.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 UUSCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 UUSCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 1 UUSCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

Before approval of a FER and issuance of a Certificate of Completion, all project reports must be submitted in digital form on electronic media (PDF).

11.1 Certifications

The following certification will appear in front of the Executive Summary of the Final Engineering Report. The certification will be signed by the Remedial Engineer, Brian Morrissey, who is a Professional Engineer registered in New York State. This certification will be appropriately signed and stamped. The certification will include the following statements:

I, Brian Morrissey, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for The Peninsula Redevelopment Project (NYSDEC BCA Index No. C203097-10-17; BCP Site No. C203097).

I certify that the Site description presented in this FER is identical to the Site descriptions presented in the Environmental Easement, the SMP, and the Brownfield Cleanup Agreement for The Peninsula Redevelopment Project and related amendments.

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

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

I certify that all use restrictions, ICs, ECs, and all operation and maintenance requirements applicable to the Site are contained in an Environmental Easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded. A SMP has been submitted by the Volunteer for the continual and proper operation, maintenance, and monitoring of all ECs employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by the NYSDEC.

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

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

I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology and soil screening methodology defined in the Remedial Action Work Plan.

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

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

12. Schedule

A schedule for the remedial action is presented on Table 16.

TABLES

Notes Utilized Throughout Tables	
Soil Tables	
J -	Estimated value
U -	Indicates that the compound was analyzed for but not detected
D -	A secondary analysis after dilution due to exceedance of the calibration range in the original sample.
B -	The analyte was found in an associated blank as well as in the sample
V -	Value altered or qualifier added during data validation
R -	Sample results rejected by validator
UJ -	Analyte was not detected. The associated reported quantitation limit is an estimate
NJ -	Detection is tentative in identification and estimated in value
J+ -	Estimated value, high bias
T -	Indicates that a quality control parameter has exceeded laboratory limits
N -	Spike recovery exceeds upper or lower control limits
ft bls -	Feet below land surface
FD -	Duplicate sample
NA -	Compound was not analyzed for by laboratory
mg/kg -	Milligrams 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	
Groundwater Tables	
NYSDEC -	New York State Department of Environmental Conservation
AWQSGVs -	Ambient Water-Quality Standards and Guidance Values
µg/L -	Micrograms per liter
ng/L -	Nanogram per liter
J -	Estimated Value
U -	Compound was analyzed for but not detected
V -	Value altered or qualifier added during data validation
R -	Sample results rejected by validator
UJ -	Analyte was not detected. The associated reported quantitation limit is an estimate
NJ -	Detection is tentative in identification and estimated in value
J+ -	Estimated value, high bias
FD -	Duplicate
--	No NYSDEC AWQSGV available
NA -	Compound was not analyzed for by laboratory
Bold data indicates that parameter was detected above the NYSDEC AWQSGVs	
Soil Vapor/Ambient Air	
J -	Estimated value
U -	Indicates that the compound was analyzed for but not detected
V -	Value altered or qualifier added during data validation
UJ -	Analyte was not detected. The associated reported quantitation limit is an estimate
FD -	Duplicate sample
ug/m3 -	Micrograms per cubic meter
Bold data indicates that parameter was detected	

Table 1. Groundwater Gauging Data - 1221 Spofford Avenue, Bronx, New York

Well	Date	Measuring Point Elevation (ft NAVD88)	Depth to Product (ft bls)	Depth To Water (ft bls)	Product Thickness (ft)	Groundwater Elevation (ft NAVD88)	Comments
MW-1	6/22/2018	50.31	-	12.43	-	37.88	
MW-2	6/22/2018	50.10	-	13.55	-	36.55	
MW-3	6/22/2018	50.23	16.52	16.60	0.08	*33.70*	Measurable product, product observed on interface probe
MW-4	6/22/2018	50.08	18.21	18.22	0.01	*31.87*	Measurable product, product observed on interface probe
MW-5	6/22/2018	29.08	1.40	1.51	0.11	*27.67*	Measurable product, product observed on interface probe
MW-6	6/22/2018	29.18	-	1.12	-	28.06	
RXMW-1	6/22/2018	34.91	-	9.41	-	25.50	
RXMW-2	6/22/2018	32.09	-	8.35	-	23.74	
RXMW-3	6/22/2018	29.48	-	1.30	-	28.18	
RXMW-4	6/22/2018	50.48	-	21.39	-	29.09	
RXMW-5	6/22/2018	50.37	-	13.33	-	37.04	
RXMW-6	6/22/2018	50.52	-	4.00	-	46.52	
RXMW-7	6/22/2018	50.71	-	2.90	-	47.81	
RXMW-8	6/22/2018	44.01	-	13.24	-	30.77	
RXMW-9	6/22/2018	58.21	-	8.46	-	49.75	
RXMW-10	6/22/2018	58.48	-	4.98	-	53.50	
RXMW-11	6/22/2018	34.33	-	5.00	-	29.33	

ft - Feet
ft bls - Feet below land surface
ft NAVD88 - Fett relative to North American Vertical Datum of 1988
Italized groundwater elevation data has been corrected for free-product thickness

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-1	RXMW-1	RXMW-10	RXMW-10
				Sample Date:	06/14/2018	06/15/2018	04/23/2018	04/23/2018
				Sample Depth (ft bls):	0 - 2	7 - 9	0 - 2	2 - 4
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0013 RV	0.0011 U	0.00094 U	0.0011 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.026 U	0.021 U	0.019 U	0.023 U
2-Hexanone	--	--	--	MG/KG	0.0066 U	0.0054 U	0.0047 U	0.0057 U
Acetone	0.05	100	0.05	MG/KG	0.0072 UJV	0.0085 UV	0.0047 U	0.0057 U
Benzene	0.06	4.8	0.06	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Bromochloromethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Bromodichloromethane	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
Bromoform	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
Bromomethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Carbon Disulfide	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
Chloroethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Chloroform	0.37	49	0.37	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Chloromethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Cyclohexane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-1	RXMW-1	RXMW-10	RXMW-10
				Sample Date:	06/14/2018	06/15/2018	04/23/2018	04/23/2018
				Sample Depth (ft bls):	0 - 2	7 - 9	0 - 2	2 - 4
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 UJV	0.0011 UJV
Ethylbenzene	1	41	1	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
m,p-Xylene	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
Methyl Acetate	--	--	--	MG/KG	0.0066 UJV	0.0054 U	0.0047 U	0.0057 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0066 U	0.0054 U	0.0047 U	0.0057 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0066 U	0.0054 U	0.0047 U	0.0057 U
Methylcyclohexane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0013 U	0.0011 UV	0.00094 UV	0.0011 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
Styrene	--	--	--	MG/KG	0.0013 UJV	0.0011 U	0.00094 U	0.0011 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Toluene	0.7	100	0.7	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0013 U	0.0011 U	0.00094 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-11	RXMW-11	RXMW-2	RXMW-2
			Sample Date:		4/23/2018	04/27/2018	06/15/2018	06/15/2018
			Sample Depth (ft bls):		0 - 2	11 - 13	0 - 2	13 - 15
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,2-Dichloropropane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.018 U	0.019 U	0.025 U	0.023 U
2-Hexanone	--	--	--	MG/KG	0.0044 U	0.0049 U	0.0063 U	0.0057 U
Acetone	0.05	100	0.05	MG/KG	0.0044 U	0.0064	0.027 UV	0.012 UV
Benzene	0.06	4.8	0.06	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Bromochloromethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Bromodichloromethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Bromoform	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Bromomethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Carbon Disulfide	--	--	--	MG/KG	0.00088 U	0.0012	0.0013 U	0.0011 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Chloroethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Chloroform	0.37	49	0.37	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Chloromethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Cyclohexane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-11	RXMW-11	RXMW-2	RXMW-2
				Sample Date:	4/23/2018	04/27/2018	06/15/2018	06/15/2018
				Sample Depth (ft bls):	0 - 2	11 - 13	0 - 2	13 - 15
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.00088 UJV	0.00097 UJV	0.0013 U	0.0011 U
Ethylbenzene	1	41	1	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
m,p-Xylene	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Methyl Acetate	--	--	--	MG/KG	0.0044 U	0.0049 U	0.0063 U	0.0057 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0044 U	0.0012 J	0.0033 J	0.0014 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0044 U	0.0049 U	0.0063 U	0.0057 U
Methylcyclohexane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.00088 U	0.00097 U	0.0013 UV	0.0011 UV
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Styrene	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Toluene	0.7	100	0.7	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Trichlorofluoromethane	--	--	--	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.00088 U	0.00097 U	0.0013 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-3	RXMW-4	RXMW-4	RXMW-5
				Sample Date:	05/25/2018	04/24/2018	05/01/2018	04/26/2018
				Sample Depth (ft bls):	1 - 3	0 - 2	13 - 15	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.021 U	0.02 U	0.023 U	0.021 U
2-Hexanone	--	--	--	MG/KG	0.0053 U	0.0049 U	0.0058 U	0.0053 U
Acetone	0.05	100	0.05	MG/KG	0.0053 U	0.0049 U	0.0044 J	0.0053 U
Benzene	0.06	4.8	0.06	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Bromochloromethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Bromodichloromethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Bromoform	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Bromomethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Carbon Disulfide	--	--	--	MG/KG	0.00057 J	0.00099 U	0.0012 U	0.0011 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Chloroethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Chloroform	0.37	49	0.37	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Chloromethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Cyclohexane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-3	RXMW-4	RXMW-4	RXMW-5
				Sample Date:	05/25/2018	04/24/2018	05/01/2018	04/26/2018
				Sample Depth (ft bls):	1 - 3	0 - 2	13 - 15	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.0011 U	0.00099 UJV	0.0012 U	0.0011 UJV
Ethylbenzene	1	41	1	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
m,p-Xylene	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Methyl Acetate	--	--	--	MG/KG	0.0053 U	0.0049 U	0.0058 U	0.0053 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0024 J	0.0049 U	0.0058 U	0.0053 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0053 U	0.0049 U	0.0058 U	0.0053 U
Methylcyclohexane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0011 UV	0.00099 U	0.0012 U	0.00019 BJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Styrene	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00035 J	0.00099 U	0.0012 U	0.00094 J
Toluene	0.7	100	0.7	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0011 U	0.00099 U	0.0012 U	0.0011 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 U	0.00099 U	0.0012 UJV	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-5	RXMW-6	RXMW-6	RXMW-7
			Sample Date:		05/02/2018	04/25/2018	04/27/2018	06/14/2018
			Sample Depth (ft bls):		12 - 14	0 - 2	9 - 11	0 - 2
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 UJV	0.0011 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0012 U	0.001 U	0.0011 UJV	0.0011 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.024 U	0.021 U	0.022 U	0.021 U
2-Hexanone	--	--	--	MG/KG	0.006 U	0.0051 U	0.0055 U	0.0053 U
Acetone	0.05	100	0.05	MG/KG	0.006 U	0.0051 U	0.0055 U	0.0053 U
Benzene	0.06	4.8	0.06	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Bromochloromethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Bromodichloromethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 UJV
Bromoform	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 UJV
Bromomethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Carbon Disulfide	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Chloroethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Chloroform	0.37	49	0.37	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Chloromethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Cyclohexane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-5	RXMW-6	RXMW-6	RXMW-7
				Sample Date:	05/02/2018	04/25/2018	04/27/2018	06/14/2018
				Sample Depth (ft bls):	12 - 14	0 - 2	9 - 11	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 UJV
Dichlorodifluoromethane	--	--	--	MG/KG	0.0012 UT	0.001 UJV	0.0011 UJV	0.0011 U
Ethylbenzene	1	41	1	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
m,p-Xylene	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Methyl Acetate	--	--	--	MG/KG	0.006 U	0.0051 U	0.0055 U	0.0053 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.006 U	0.0051 U	0.0055 U	0.0053 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.006 U	0.0051 U	0.0055 U	0.0053 U
Methylcyclohexane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.00031 BJ	0.001 U	0.00021 BJ	0.0011 UV
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Styrene	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Toluene	0.7	100	0.7	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0012 U	0.001 U	0.0011 U	0.0011 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-7	RXMW-7	RXMW-8	RXMW-8
				Sample Date:	06/15/2018	06/15/2018	05/29/2018	05/29/2018
				Sample Depth (ft bls):	12 - 14	12 - 14	1 - 3	9 - 11
				Normal or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.023 U	0.023 U	0.02 U	0.018 U
2-Hexanone	--	--	--	MG/KG	0.0057 U	0.0057 U	0.0049 U	0.0045 U
Acetone	0.05	100	0.05	MG/KG	0.0087 UV	0.0057 U	0.0063 UV	0.0056 UV
Benzene	0.06	4.8	0.06	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Bromochloromethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Bromodichloromethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Bromoform	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Bromomethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Carbon Disulfide	--	--	--	MG/KG	0.00034 J	0.00031 J	0.00099 U	0.0009 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Chloroethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Chloroform	0.37	49	0.37	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Chloromethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Cyclohexane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-7	RXMW-7	RXMW-8	RXMW-8
				Sample Date:	06/15/2018	06/15/2018	05/29/2018	05/29/2018
				Sample Depth (ft bls):	12 - 14	12 - 14	1 - 3	9 - 11
				Normal or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Ethylbenzene	1	41	1	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
m,p-Xylene	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Methyl Acetate	--	--	--	MG/KG	0.0057 U	0.0057 U	0.0049 U	0.0045 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0057 U	0.0057 U	0.0049 UV	0.0045 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0057 U	0.0057 U	0.0049 U	0.0045 U
Methylcyclohexane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.0011 UV	0.0011 UV	0.00099 UV	0.0009 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Styrene	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Toluene	0.7	100	0.7	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 U	0.0011 U	0.00099 U	0.0009 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-9	RXMW-9	RXSB-11
				Sample Date:	04/23/2018	04/25/2018	04/23/2018
				Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2
				Normal or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit			
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.00092 U	0.00094 U	0.001 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.00092 U	0.00094 U	0.001 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.00092 U	0.00094 U	0.001 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.00092 U	0.00094 U	0.001 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.00092 U	0.00094 U	0.001 U
1,2-Dichloropropane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.00092 U	0.00094 U	0.001 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.00092 U	0.00094 U	0.001 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.018 U	0.019 U	0.02 U
2-Hexanone	--	--	--	MG/KG	0.0046 U	0.0047 U	0.005 U
Acetone	0.05	100	0.05	MG/KG	0.0046 U	0.0044 J	0.005 U
Benzene	0.06	4.8	0.06	MG/KG	0.00092 U	0.00094 U	0.001 U
Bromochloromethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Bromodichloromethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Bromoform	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Bromomethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Carbon Disulfide	--	--	--	MG/KG	0.00092 U	0.00046 J	0.001 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.00092 U	0.00094 U	0.001 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.00092 U	0.00094 U	0.001 U
Chloroethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Chloroform	0.37	49	0.37	MG/KG	0.00092 U	0.00094 U	0.001 U
Chloromethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.00092 U	0.00094 U	0.001 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Cyclohexane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-9	RXMW-9	RXSB-11
				Sample Date:	04/23/2018	04/25/2018	04/23/2018
				Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2
				Normal or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit			
Dibromochloromethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.00092 UJV	0.00094 UJV	0.001 UJV
Ethylbenzene	1	41	1	MG/KG	0.00092 U	0.00094 U	0.001 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
m,p-Xylene	--	--	--	MG/KG	0.00092 U	0.00021 J	0.001 U
Methyl Acetate	--	--	--	MG/KG	0.0046 U	0.0047 U	0.005 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0046 U	0.0047 U	0.005 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0046 U	0.0047 U	0.005 U
Methylcyclohexane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.00092 UV	0.00094 U	0.001 UV
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.00092 U	9.5E-05 J	0.001 U
Styrene	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.00092 U	0.00094 U	0.001 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.00092 U	0.00094 U	0.001 U
Toluene	0.7	100	0.7	MG/KG	0.00092 U	0.00094 U	0.001 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.00092 U	0.00094 U	0.001 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.00092 U	0.00094 U	0.001 U
Trichlorofluoromethane	--	--	--	MG/KG	0.00092 U	0.00094 U	0.001 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.00092 U	0.00094 U	0.001 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-11	RXSB-12	RXSB-12	RXSB-13
				Sample Date:	04/26/2018	04/23/2018	04/26/2018	04/24/2018
				Sample Depth (ft bls):	3 - 5	0 - 2	6 - 8	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.021 U	0.019 U	0.025 U	0.023 U
2-Hexanone	--	--	--	MG/KG	0.0053 U	0.0048 U	0.0063 U	0.0058 U
Acetone	0.05	100	0.05	MG/KG	0.0053 U	0.0048 U	0.0063 U	0.0058 U
Benzene	0.06	4.8	0.06	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Bromochloromethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Bromodichloromethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Bromoform	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Bromomethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Carbon Disulfide	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Chloroethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Chloroform	0.37	49	0.37	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Chloromethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Cyclohexane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-11	RXSB-12	RXSB-12	RXSB-13
				Sample Date:	04/26/2018	04/23/2018	04/26/2018	04/24/2018
				Sample Depth (ft bls):	3 - 5	0 - 2	6 - 8	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.0011 UJV	0.00096 UJV	0.0013 UJV	0.0012 UJV
Ethylbenzene	1	41	1	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
m,p-Xylene	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Methyl Acetate	--	--	--	MG/KG	0.0053 U	0.0048 U	0.0063 U	0.0058 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0053 U	0.0048 U	0.0063 U	0.0058 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0053 U	0.0048 U	0.0063 U	0.0058 U
Methylcyclohexane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.00021 BJ	0.00096 U	0.00027 BJ	0.0012 U
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Styrene	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.00071 J
Toluene	0.7	100	0.7	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.00081 J
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 U	0.00096 U	0.0013 U	0.0012 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-13	RXSB-14	RXSB-14	RXSB-15
				Sample Date:	04/26/2018	04/24/2018	04/24/2018	04/26/2018
				Sample Depth (ft bls):	13 - 15	0 - 2	0 - 2	0 - 2
				Normal or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichloropropane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.021 U	0.022 U	0.021 U	0.02 U
2-Hexanone	--	--	--	MG/KG	0.0052 U	0.0054 U	0.0053 U	0.005 U
Acetone	0.05	100	0.05	MG/KG	0.0052 U	0.0054 U	0.0053 U	0.005 U
Benzene	0.06	4.8	0.06	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromochloromethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromodichloromethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromoform	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromomethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Carbon Disulfide	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloroethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloroform	0.37	49	0.37	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloromethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Cyclohexane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-13	RXSB-14	RXSB-14	RXSB-15
				Sample Date:	04/26/2018	04/24/2018	04/24/2018	04/26/2018
				Sample Depth (ft bls):	13 - 15	0 - 2	0 - 2	0 - 2
				Normal or Field Duplicate:	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.001 UJV	0.0011 UJV	0.0011 UJV	0.001 UJV
Ethylbenzene	1	41	1	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
m,p-Xylene	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Methyl Acetate	--	--	--	MG/KG	0.0052 U	0.0054 U	0.0053 U	0.005 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0052 U	0.0054 U	0.0053 U	0.005 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0052 U	0.0054 U	0.0053 U	0.005 U
Methylcyclohexane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.00018 BJ	0.0011 U	0.0011 U	0.0002 BJ
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Styrene	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Toluene	0.7	100	0.7	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Trichlorofluoromethane	--	--	--	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.001 U	0.0011 U	0.0011 U	0.001 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-15	RXSB-16	RXSB-16	RXSB-17
				Sample Date:	05/01/2018	05/29/2018	05/29/2018	05/23/2018
				Sample Depth (ft bls):	6 - 8	1 - 3	9 - 11	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,2-Dichloropropane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.021 U	0.02 U	0.019 U	0.03 UJV
2-Hexanone	--	--	--	MG/KG	0.0053 U	0.005 U	0.0048 U	0.0075 UJV
Acetone	0.05	100	0.05	MG/KG	0.0048 J	0.005 UV	0.006 UV	0.0079 UJV
Benzene	0.06	4.8	0.06	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Bromochloromethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Bromodichloromethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Bromoform	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Bromomethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Carbon Disulfide	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Chlorobenzene	1.1	100	1.1	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Chloroethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Chloroform	0.37	49	0.37	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Chloromethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Cyclohexane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-15	RXSB-16	RXSB-16	RXSB-17
				Sample Date:	05/01/2018	05/29/2018	05/29/2018	05/23/2018
				Sample Depth (ft bls):	6 - 8	1 - 3	9 - 11	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Dichlorodifluoromethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Ethylbenzene	1	41	1	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
m,p-Xylene	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Methyl Acetate	--	--	--	MG/KG	0.0053 U	0.005 U	0.0048 U	0.0075 UJV
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.0053 U	0.005 U	0.0048 U	0.0075 UJV
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.0053 U	0.005 U	0.0048 U	0.0075 UJV
Methylcyclohexane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Methylene Chloride	0.05	100	0.05	MG/KG	0.0011 U	0.001 U	0.00096 U	0.011 UJV
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Styrene	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0011 U	0.00016 J	0.00027 J	0.0015 UJV
Toluene	0.7	100	0.7	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Trichlorofluoromethane	--	--	--	MG/KG	0.0011 U	0.001 U	0.00096 U	0.0015 UJV
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0011 UJV	0.001 U	0.00096 U	0.0015 UJV

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-17	RXSB-17	RXTGW-12	RXTGW-12
				Sample Date:	05/23/2018	05/23/2018	05/24/2018	05/24/2018
				Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2	4 - 6
				Normal or Field Duplicate:	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,1,1-Trichloroethane (TCA)	0.68	100	0.68	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,1,2,2-Tetrachloroethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,1,2-Trichloroethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,1-Dichloroethane	0.27	26	0.27	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,1-Dichloroethene	0.33	100	0.33	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,2,3-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,2,4-Trichlorobenzene	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,2-Dibromo-3-Chloropropane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,2-Dichlorobenzene	1.1	100	1.1	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,2-Dichloroethane	0.02	3.1	0.02	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,2-Dichloropropane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,3-Dichlorobenzene	2.4	49	2.4	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
1,4-Dichlorobenzene	1.8	13	1.8	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 UJV
1,4-Dioxane (P-Dioxane)	0.1	13	0.1	MG/KG	0.047 U	0.019 U	0.016 U	0.017 U
2-Hexanone	--	--	--	MG/KG	0.012 U	0.0049 U	0.0039 U	0.0042 U
Acetone	0.05	100	0.05	MG/KG	0.012 U	0.0049 U	0.0045 UV	0.0042 U
Benzene	0.06	4.8	0.06	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Bromochloromethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Bromodichloromethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Bromoform	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Bromomethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Carbon Disulfide	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Carbon Tetrachloride	0.76	2.4	0.76	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Chlorobenzene	1.1	100	1.1	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Chloroethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Chloroform	0.37	49	0.37	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Chloromethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Cis-1,2-Dichloroethylene	0.25	100	0.25	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Cis-1,3-Dichloropropene	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Cyclohexane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U

Table 2. Summary of Volatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-17	RXSB-17	RXTGW-12	RXTGW-12
				Sample Date:	05/23/2018	05/23/2018	05/24/2018	05/24/2018
				Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2	4 - 6
				Normal or Field Duplicate:	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Dibromochloromethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Dichlorodifluoromethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Ethylbenzene	1	41	1	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Isopropylbenzene (Cumene)	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
m,p-Xylene	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Methyl Acetate	--	--	--	MG/KG	0.012 U	0.0049 U	0.0039 U	0.0042 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	0.12	MG/KG	0.012 U	0.0049 U	0.0039 U	0.0042 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	--	MG/KG	0.012 U	0.0049 U	0.0039 U	0.0042 U
Methylcyclohexane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Methylene Chloride	0.05	100	0.05	MG/KG	0.016 B	0.0024 UV	0.0099 UV	0.00083 UV
O-Xylene (1,2-Dimethylbenzene)	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Styrene	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Tert-Butyl Methyl Ether	0.93	100	0.93	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Tetrachloroethylene (PCE)	1.3	19	1.3	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Toluene	0.7	100	0.7	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Trans-1,2-Dichloroethene	0.19	100	0.19	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Trans-1,3-Dichloropropene	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Trichloroethylene (TCE)	0.47	21	0.47	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Trichlorofluoromethane	--	--	--	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U
Vinyl Chloride	0.02	0.9	0.02	MG/KG	0.0023 U	0.00097 U	0.00078 U	0.00083 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-1	RXMW-1	RXMW-10	RXMW-10
				Sample Date:	06/14/2018	06/15/2018	04/23/2018	04/23/2018
				Sample Depth (ft bls):	0 - 2	7 - 9	0 - 2	2 - 4
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.16 UJV	0.14 U	0.15 U	0.15 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 UJV	0.14 U	0.15 U	0.15 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.31 RV	0.29 U	0.3 U	0.3 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.078 UJV	0.072 U	0.076 U	0.075 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.078 UJV	0.072 U	0.076 U	0.075 U
2-Chloronaphthalene	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2-Chlorophenol	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2-Methylnaphthalene	--	--	--	MG/KG	0.038 JV	0.35 U	0.38 U	0.036 J
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2-Nitroaniline	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
2-Nitrophenol	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.16 UJV	0.14 U	0.15 U	0.15 U
3-Nitroaniline	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.31 RV	0.29 U	0.3 U	0.3 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
4-Chloroaniline	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
4-Nitroaniline	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
4-Nitrophenol	--	--	--	MG/KG	0.78 UJV	0.72 U	0.76 U	0.75 U
Acenaphthene	20	100	98	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Acenaphthylene	100	100	107	MG/KG	0.054 JV	0.35 U	0.38 U	0.37 U
Acetophenone	--	--	--	MG/KG	0.011 JV	0.35 U	0.38 U	0.37 U
Anthracene	100	100	1000	MG/KG	0.013 JV	0.35 U	0.38 U	0.023 J
Atrazine	--	--	--	MG/KG	0.16 UJV	0.14 U	0.15 U	0.15 U
Benzaldehyde	--	--	--	MG/KG	0.019 JV	0.35 U	0.38 U	0.37 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.1 JV	0.035 U	0.052	0.095
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.076 JV	0.035 U	0.051	0.12
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.14 JV	0.035 U	0.067	0.23

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-1	RXMW-1	RXMW-10	RXMW-10
			Sample Date:		06/14/2018	06/15/2018	04/23/2018	04/23/2018
			Sample Depth (ft bls):		0 - 2	7 - 9	0 - 2	2 - 4
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.051 JV	0.35 U	0.022 J	0.12 J
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.054 JV	0.035 U	0.024 J	0.08
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.039 UJV	0.035 U	0.038 U	0.037 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.22 JV	0.022 J	0.38 U	0.37 U
Caprolactam	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Carbazole	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Chrysene	**1**	3.9	1	MG/KG	0.11 JV	0.35 U	0.053 J	0.12 J
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.018 JV	0.035 U	0.038 U	0.047
Dibenzofuran	7	59	210	MG/KG	0.011 JV	0.35 U	0.38 U	0.37 U
Diethyl Phthalate	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Dimethyl Phthalate	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Fluoranthene	100	100	1000	MG/KG	0.15 JV	0.35 U	0.078 J	0.17 J
Fluorene	30	100	386	MG/KG	0.01 JV	0.35 U	0.38 U	0.37 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.039 UJV	0.035 U	0.038 U	0.037 U
Hexachlorobutadiene	--	--	--	MG/KG	0.078 UJV	0.072 U	0.076 U	0.075 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.39 RV	0.35 U	0.38 U	0.37 U
Hexachloroethane	--	--	--	MG/KG	0.039 UJV	0.035 U	0.038 U	0.037 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.047 JV	0.035 U	0.029 J	0.12
Isophorone	--	--	--	MG/KG	0.16 UJV	0.14 U	0.15 U	0.15 U
Naphthalene	12	100	12	MG/KG	0.087 JV	0.35 U	0.38 U	0.08 J
Nitrobenzene	--	--	--	MG/KG	0.039 UJV	0.035 U	0.038 U	0.037 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.039 UJV	0.035 U	0.038 U	0.037 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.31 UJV	0.29 U	0.3 U	0.3 U
Phenanthrene	100	100	1000	MG/KG	0.085 JV	0.35 U	0.035 J	0.085 J
Phenol	0.33	100	0.33	MG/KG	0.39 UJV	0.35 U	0.38 U	0.37 U
Pyrene	100	100	1000	MG/KG	0.22 JV	0.35 U	0.079 J	0.16 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-11	RXMW-11	RXMW-2	RXMW-2
				Sample Date:	04/23/2018	04/27/2018	06/15/2018	06/15/2018
				Sample Depth (ft bls):	0 - 2	11 - 13	0 - 2	13 - 15
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.15 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.15 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.28 U	0.29 U	0.29 U	0.29 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.071 U	0.072 U	0.074 U	0.073 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.071 U	0.072 U	0.074 U	0.073 U
2-Chloronaphthalene	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2-Chlorophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2-Methylnaphthalene	--	--	--	MG/KG	0.35 U	0.35 U	0.028 J	0.014 J
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2-Nitroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
2-Nitrophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.15 U
3-Nitroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.28 U	0.29 U	0.29 U	0.29 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
4-Chloroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
4-Nitroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
4-Nitrophenol	--	--	--	MG/KG	0.71 U	0.72 U	0.74 U	0.73 U
Acenaphthene	20	100	98	MG/KG	0.35 U	0.35 U	0.11 J	0.36 U
Acenaphthylene	100	100	107	MG/KG	0.35 U	0.35 U	0.0089 J	0.36 U
Acetophenone	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Anthracene	100	100	1000	MG/KG	0.35 U	0.35 U	0.11 J	0.36 U
Atrazine	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.15 U
Benzaldehyde	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.035 U	0.035 U	0.35	0.036 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.017 JV	0.035 U	0.3	0.036 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.028 JV	0.035 U	0.41	0.036 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-11	RXMW-11	RXMW-2	RXMW-2
				Sample Date:	04/23/2018	04/27/2018	06/15/2018	06/15/2018
				Sample Depth (ft bls):	0 - 2	11 - 13	0 - 2	13 - 15
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.35 UJV	0.35 U	0.14 J	0.36 U
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.014 JV	0.035 U	0.18	0.036 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.035 U	0.035 U	0.037 U	0.036 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.46	0.36 U
Caprolactam	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Carbazole	--	--	--	MG/KG	0.35 U	0.35 U	0.071 J	0.36 U
Chrysene	**1**	3.9	1	MG/KG	0.35 U	0.35 U	0.34 J	0.36 U
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.035 UJV	0.035 U	0.046	0.036 U
Dibenzofuran	7	59	210	MG/KG	0.35 U	0.35 U	0.038 J	0.36 U
Diethyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Dimethyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.12 JV	0.35 U	0.37 U	0.36 U
Fluoranthene	100	100	1000	MG/KG	0.011 J	0.35 U	0.68	0.36 U
Fluorene	30	100	386	MG/KG	0.35 U	0.35 U	0.061 J	0.36 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.035 U	0.035 U	0.037 U	0.036 U
Hexachlorobutadiene	--	--	--	MG/KG	0.071 U	0.072 U	0.074 U	0.073 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Hexachloroethane	--	--	--	MG/KG	0.035 U	0.035 U	0.037 U	0.036 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.035 UJV	0.035 U	0.18	0.036 U
Isophorone	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.15 U
Naphthalene	12	100	12	MG/KG	0.35 U	0.35 U	0.07 J	0.038 J
Nitrobenzene	--	--	--	MG/KG	0.035 U	0.035 U	0.037 U	0.036 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.035 U	0.035 U	0.037 U	0.036 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.28 U	0.29 U	0.29 U	0.29 U
Phenanthrene	100	100	1000	MG/KG	0.35 U	0.35 U	0.6	0.36 U
Phenol	0.33	100	0.33	MG/KG	0.35 U	0.35 U	0.37 U	0.36 U
Pyrene	100	100	1000	MG/KG	0.35 U	0.35 U	0.71	0.36 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-3	RXMW-4	RXMW-4	RXMW-5
			Sample Date:		05/25/2018	04/24/2018	05/01/2018	04/26/2018
			Sample Depth (ft bls):		1 - 3	0 - 2	13 - 15	0 - 2
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.16 U	0.14 U	0.15 U	0.15 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.16 U	0.14 U	0.15 U	0.15 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.31 U	0.29 U	0.29 U	0.3 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.079 U	0.073 U	0.073 U	0.075 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.079 U	0.073 U	0.073 U	0.075 U
2-Chloronaphthalene	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2-Chlorophenol	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2-Methylnaphthalene	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2-Nitroaniline	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
2-Nitrophenol	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.16 U	0.14 U	0.15 U	0.15 U
3-Nitroaniline	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.31 U	0.29 U	0.29 U	0.3 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
4-Chloroaniline	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.39 UJV	0.36 U	0.36 U	0.37 U
4-Nitroaniline	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
4-Nitrophenol	--	--	--	MG/KG	0.79 U	0.73 U	0.73 U	0.75 U
Acenaphthene	20	100	98	MG/KG	0.39 U	0.36 U	0.36 U	0.056 J
Acenaphthylene	100	100	107	MG/KG	0.39 U	0.36 U	0.36 U	0.056 J
Acetophenone	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Anthracene	100	100	1000	MG/KG	0.39 U	0.36 U	0.36 U	0.16 J
Atrazine	--	--	--	MG/KG	0.16 U	0.14 UT	0.15 UJV	0.15 U
Benzaldehyde	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.07	0.078	0.036 U	0.67
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.063	0.09	0.036 U	0.7
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.079	0.11	0.036 U	0.89

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-3	RXMW-4	RXMW-4	RXMW-5
			Sample Date:		05/25/2018	04/24/2018	05/01/2018	04/26/2018
			Sample Depth (ft bls):		1 - 3	0 - 2	13 - 15	0 - 2
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.04 J	0.049 J	0.36 U	0.37
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.036 J	0.042	0.036 U	0.39
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.2 J	0.36 U	0.36 U	0.37 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.039 U	0.036 U	0.036 U	0.037 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.29 J	0.36 U	0.36 U	0.37 U
Caprolactam	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Carbazole	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.046 J
Chrysene	**1**	3.9	1	MG/KG	0.058 J	0.095 J	0.36 U	0.75
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.039 U	0.019 J	0.036 U	0.11
Dibenzofuran	7	59	210	MG/KG	0.39 U	0.36 U	0.36 U	0.022 J
Diethyl Phthalate	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Dimethyl Phthalate	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Fluoranthene	100	100	1000	MG/KG	0.11 J	0.12 J	0.36 U	1
Fluorene	30	100	386	MG/KG	0.39 U	0.36 U	0.36 U	0.056 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.039 U	0.036 U	0.036 U	0.037 U
Hexachlorobutadiene	--	--	--	MG/KG	0.079 U	0.073 U	0.073 U	0.075 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Hexachloroethane	--	--	--	MG/KG	0.039 U	0.036 U	0.036 UJV	0.037 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.038 J	0.056	0.036 U	**0.52**
Isophorone	--	--	--	MG/KG	0.16 U	0.14 U	0.15 U	0.15 U
Naphthalene	12	100	12	MG/KG	0.39 U	0.014 J	0.36 U	0.37 U
Nitrobenzene	--	--	--	MG/KG	0.039 U	0.036 U	0.036 U	0.037 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.039 U	0.036 U	0.036 U	0.037 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.31 U	0.29 U	0.29 U	0.3 U
Phenanthrene	100	100	1000	MG/KG	0.023 J	0.033 J	0.36 U	0.61
Phenol	0.33	100	0.33	MG/KG	0.39 U	0.36 U	0.36 U	0.37 U
Pyrene	100	100	1000	MG/KG	0.14 J	0.13 J	0.36 U	1.1

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-5	RXMW-6	RXMW-6	RXMW-7
				Sample Date:	05/02/2018	04/25/2018	04/27/2018	06/14/2018
				Sample Depth (ft bls):	12 - 14	0 - 2	9 - 11	0 - 2
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.15 U	0.14 U	0.15 U	0.15 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.15 U	0.14 U	0.15 U	0.15 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.29 U	0.29 U	0.29 RV	0.3 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.073 U	0.072 U	0.074 U	0.075 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.073 U	0.072 U	0.074 U	0.075 U
2-Chloronaphthalene	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2-Chlorophenol	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2-Methylnaphthalene	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.0086 J
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2-Nitroaniline	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
2-Nitrophenol	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.15 U	0.14 U	0.15 U	0.15 U
3-Nitroaniline	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.29 U	0.29 U	0.29 UJV	0.3 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
4-Chloroaniline	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
4-Nitroaniline	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
4-Nitrophenol	--	--	--	MG/KG	0.73 U	0.72 U	0.74 U	0.75 U
Acenaphthene	20	100	98	MG/KG	0.36 U	0.035 J	0.36 U	0.051 J
Acenaphthylene	100	100	107	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Acetophenone	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Anthracene	100	100	1000	MG/KG	0.36 U	0.058 J	0.36 U	0.065 J
Atrazine	--	--	--	MG/KG	0.15 U	0.14 U	0.15 U	0.15 U
Benzaldehyde	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.036 U	0.14	0.036 U	0.25
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.036 U	0.12	0.036 U	0.21
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.036 U	0.15	0.036 U	0.29

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-5	RXMW-6	RXMW-6	RXMW-7
			Sample Date:		05/02/2018	04/25/2018	04/27/2018	06/14/2018
			Sample Depth (ft bls):		12 - 14	0 - 2	9 - 11	0 - 2
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.36 U	0.059 J	0.36 U	0.11 J
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.036 U	0.058	0.036 U	0.12
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.036 U	0.036 U	0.036 U	0.037 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Caprolactam	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Carbazole	--	--	--	MG/KG	0.36 U	0.024 J	0.36 U	0.038 J
Chrysene	**1**	3.9	1	MG/KG	0.36 U	0.13 J	0.36 U	0.23 J
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.036 U	0.027 J	0.036 U	0.039
Dibenzofuran	7	59	210	MG/KG	0.36 U	0.012 J	0.36 U	0.37 U
Diethyl Phthalate	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Dimethyl Phthalate	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Fluoranthene	100	100	1000	MG/KG	0.36 U	0.26 J	0.36 U	0.52
Fluorene	30	100	386	MG/KG	0.36 U	0.025 J	0.36 U	0.029 J
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.036 U	0.036 U	0.036 U	0.037 U
Hexachlorobutadiene	--	--	--	MG/KG	0.073 U	0.072 U	0.074 U	0.075 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Hexachloroethane	--	--	--	MG/KG	0.036 U	0.036 U	0.036 UJV	0.037 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.036 U	0.061	0.036 U	0.14
Isophorone	--	--	--	MG/KG	0.15 U	0.14 U	0.15 U	0.15 U
Naphthalene	12	100	12	MG/KG	0.36 U	0.36 U	0.36 U	0.024 J
Nitrobenzene	--	--	--	MG/KG	0.036 U	0.036 U	0.036 U	0.037 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.036 U	0.036 U	0.036 U	0.037 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.29 U	0.29 U	0.29 U	0.3 U
Phenanthrene	100	100	1000	MG/KG	0.36 U	0.23 J	0.36 U	0.32 J
Phenol	0.33	100	0.33	MG/KG	0.36 U	0.36 U	0.36 U	0.37 U
Pyrene	100	100	1000	MG/KG	0.36 U	0.25 J	0.0092 J	0.43

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-7	RXMW-7	RXMW-8	RXMW-8
			Sample Date:		06/15/2018	06/15/2018	05/29/2018	05/29/2018
			Sample Depth (ft bls):		12 - 14	12 - 14	1 - 3	9 - 11
			Normal or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.15 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.15 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.31 U	0.31 U	0.29 UJV	0.29 UJV
2,4-Dinitrotoluene	--	--	--	MG/KG	0.078 U	0.078 U	0.073 U	0.074 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.078 U	0.078 U	0.073 U	0.074 U
2-Chloronaphthalene	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2-Chlorophenol	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2-Methylnaphthalene	--	--	--	MG/KG	0.014 J	0.39 U	0.36 U	0.36 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2-Nitroaniline	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
2-Nitrophenol	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.15 U
3-Nitroaniline	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.31 U	0.31 U	0.29 UJV	0.29 UJV
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
4-Chloroaniline	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.38 U	0.39 U	0.36 U	0.011 J
4-Nitroaniline	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
4-Nitrophenol	--	--	--	MG/KG	0.78 U	0.78 U	0.73 U	0.74 U
Acenaphthene	20	100	98	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Acenaphthylene	100	100	107	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Acetophenone	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Anthracene	100	100	1000	MG/KG	0.38 U	0.39 U	0.039 J	0.36 U
Atrazine	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.15 U
Benzaldehyde	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.038 U	0.039 U	0.2	0.031 J
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.038 U	0.039 U	0.19	0.023 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.038 U	0.039 U	0.26	0.034 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-7	RXMW-7	RXMW-8	RXMW-8
				Sample Date:	06/15/2018	06/15/2018	05/29/2018	05/29/2018
				Sample Depth (ft bls):	12 - 14	12 - 14	1 - 3	9 - 11
				Normal or Field Duplicate:	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.38 U	0.39 U	0.15 J	0.36 U
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.038 U	0.039 U	0.095	0.0096 J
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.039 J
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.038 U	0.039 U	0.036 U	0.036 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.3 J
Caprolactam	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Carbazole	--	--	--	MG/KG	0.38 U	0.39 U	0.029 J	0.36 U
Chrysene	**1**	3.9	1	MG/KG	0.38 U	0.39 U	0.19 J	0.021 J
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.038 U	0.039 U	0.031 J	0.036 U
Dibenzofuran	7	59	210	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Diethyl Phthalate	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Dimethyl Phthalate	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Fluoranthene	100	100	1000	MG/KG	0.38 U	0.39 U	0.37	0.045 J
Fluorene	30	100	386	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.038 U	0.039 U	0.036 U	0.036 U
Hexachlorobutadiene	--	--	--	MG/KG	0.078 U	0.078 U	0.073 U	0.074 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Hexachloroethane	--	--	--	MG/KG	0.038 U	0.039 U	0.036 U	0.036 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.038 U	0.039 U	0.15	0.019 J
Isophorone	--	--	--	MG/KG	0.15 U	0.16 U	0.15 U	0.15 U
Naphthalene	12	100	12	MG/KG	0.03 J	0.39 U	0.36 U	0.36 U
Nitrobenzene	--	--	--	MG/KG	0.038 U	0.039 U	0.036 U	0.036 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.038 U	0.039 U	0.036 U	0.036 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.31 U	0.31 U	0.29 U	0.29 U
Phenanthrene	100	100	1000	MG/KG	0.38 U	0.39 U	0.2 J	0.032 J
Phenol	0.33	100	0.33	MG/KG	0.38 U	0.39 U	0.36 U	0.36 U
Pyrene	100	100	1000	MG/KG	0.38 U	0.39 U	0.3 J	0.36 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-9	RXMW-9	RXSB-11	RXSB-11
				Sample Date:	04/23/2018	04/25/2018	04/23/2018	04/26/2018
				Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2	3 - 5
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.15 U	0.15 U	0.14 U	0.14 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.15 U	0.15 U	0.14 U	0.14 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.3 U	0.29 U	0.28 U	0.29 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U
2-Chloronaphthalene	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2-Chlorophenol	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2-Methylnaphthalene	--	--	--	MG/KG	0.37 U	0.36 U	0.035 J	0.36 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2-Nitroaniline	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
2-Nitrophenol	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.15 U	0.15 U	0.14 U	0.14 U
3-Nitroaniline	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.3 U	0.29 U	0.28 U	0.29 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
4-Chloroaniline	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
4-Nitroaniline	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
4-Nitrophenol	--	--	--	MG/KG	0.75 U	0.73 U	0.71 U	0.72 U
Acenaphthene	20	100	98	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Acenaphthylene	100	100	107	MG/KG	0.37 U	0.36 U	0.068 J	0.36 U
Acetophenone	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Anthracene	100	100	1000	MG/KG	0.37 U	0.36 U	0.06 J	0.36 U
Atrazine	--	--	--	MG/KG	0.15 U	0.15 U	0.14 U	0.14 U
Benzaldehyde	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.028 J	0.036 U	0.061	0.036 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.022 J	0.036 U	0.1	0.036 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.027 J	0.012 J	0.15	0.036 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-9	RXMW-9	RXSB-11	RXSB-11
				Sample Date:	04/23/2018	04/25/2018	04/23/2018	04/26/2018
				Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2	3 - 5
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.37 U	0.36 U	0.062 J	0.36 U
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.037 U	0.036 U	0.051	0.036 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Caprolactam	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Carbazole	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Chrysene	**1**	3.9	1	MG/KG	0.021 J	0.011 J	0.06 J	0.36 U
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.037 U	0.036 U	0.019 J	0.036 U
Dibenzofuran	7	59	210	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Diethyl Phthalate	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Dimethyl Phthalate	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Fluoranthene	100	100	1000	MG/KG	0.027 J	0.015 J	0.081 J	0.36 U
Fluorene	30	100	386	MG/KG	0.37 U	0.36 U	0.02 J	0.36 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
Hexachlorobutadiene	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Hexachloroethane	--	--	--	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.016 J	0.036 U	0.077	0.036 U
Isophorone	--	--	--	MG/KG	0.15 U	0.15 U	0.14 U	0.14 U
Naphthalene	12	100	12	MG/KG	0.37 U	0.36 U	0.061 J	0.36 U
Nitrobenzene	--	--	--	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.3 U	0.29 U	0.28 U	0.29 U
Phenanthrene	100	100	1000	MG/KG	0.37 U	0.36 U	0.052 J	0.36 U
Phenol	0.33	100	0.33	MG/KG	0.37 U	0.36 U	0.35 U	0.36 U
Pyrene	100	100	1000	MG/KG	0.032 J	0.019 J	0.079 J	0.36 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-12	RXSB-12	RXSB-13	RXSB-13
			Sample Date:		04/23/2018	04/26/2018	04/24/2018	04/26/2018
			Sample Depth (ft bls):		0 - 2	6 - 8	0 - 2	13 - 15
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.14 U	0.15 U	0.16 U	0.15 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.14 U	0.15 U	0.16 U	0.15 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.29 U	0.31 U	0.32 U	0.29 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.073 U	0.077 U	0.079 U	0.074 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.073 U	0.077 U	0.079 U	0.074 U
2-Chloronaphthalene	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2-Chlorophenol	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2-Methylnaphthalene	--	--	--	MG/KG	0.36 U	0.38 U	0.045 J	0.36 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2-Nitroaniline	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
2-Nitrophenol	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.14 U	0.15 U	0.16 U	0.15 U
3-Nitroaniline	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.29 U	0.31 U	0.32 U	0.29 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
4-Chloroaniline	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
4-Nitroaniline	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
4-Nitrophenol	--	--	--	MG/KG	0.73 U	0.77 U	0.79 U	0.74 U
Acenaphthene	20	100	98	MG/KG	0.36 U	0.38 U	0.11 J	0.36 U
Acenaphthylene	100	100	107	MG/KG	0.36 U	0.38 U	0.11 J	0.36 U
Acetophenone	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Anthracene	100	100	1000	MG/KG	0.36 U	0.38 U	0.29 J	0.36 U
Atrazine	--	--	--	MG/KG	0.14 U	0.15 U	0.16 UJV	0.15 U
Benzaldehyde	--	--	--	MG/KG	0.36 U	0.38 U	0.019 J	0.36 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.036 U	0.038 U	**1.2**	0.036 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.036 U	0.038 U	**1.3**	0.036 U
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.036 U	0.038 U	**1.7**	0.036 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-12	RXSB-12	RXSB-13	RXSB-13
				Sample Date:	04/23/2018	04/26/2018	04/24/2018	04/26/2018
				Sample Depth (ft bls):	0 - 2	6 - 8	0 - 2	13 - 15
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.36 U	0.38 U	0.79	0.36 U
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.036 U	0.038 U	0.65	0.036 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.036 U	0.038 U	0.039 U	0.036 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Caprolactam	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Carbazole	--	--	--	MG/KG	0.36 U	0.38 U	0.12 J	0.36 U
Chrysene	**1**	3.9	1	MG/KG	0.36 U	0.38 U	**1.3**	0.36 U
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.036 U	0.038 U	0.23	0.036 U
Dibenzofuran	7	59	210	MG/KG	0.36 U	0.38 U	0.069 J	0.36 U
Diethyl Phthalate	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Dimethyl Phthalate	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Fluoranthene	100	100	1000	MG/KG	0.36 U	0.38 U	2.3	0.36 U
Fluorene	30	100	386	MG/KG	0.36 U	0.38 U	0.086 J	0.36 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.036 U	0.038 U	0.039 U	0.036 U
Hexachlorobutadiene	--	--	--	MG/KG	0.073 U	0.077 U	0.079 U	0.074 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Hexachloroethane	--	--	--	MG/KG	0.036 U	0.038 U	0.039 U	0.036 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.036 U	0.038 U	**0.78**	0.036 U
Isophorone	--	--	--	MG/KG	0.14 U	0.15 U	0.16 U	0.15 U
Naphthalene	12	100	12	MG/KG	0.36 U	0.38 U	0.12 J	0.36 U
Nitrobenzene	--	--	--	MG/KG	0.036 U	0.038 U	0.039 U	0.036 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.036 U	0.038 U	0.039 U	0.036 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.29 U	0.31 U	0.32 U	0.29 U
Phenanthrene	100	100	1000	MG/KG	0.36 U	0.38 U	1.1	0.36 U
Phenol	0.33	100	0.33	MG/KG	0.36 U	0.38 U	0.39 U	0.36 U
Pyrene	100	100	1000	MG/KG	0.36 U	0.38 U	2.2	0.36 U

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-14	RXSB-14	RXSB-15	RXSB-15
			Sample Date:		04/24/2018	04/24/2018	04/26/2018	05/01/2018
			Sample Depth (ft bls):		0 - 2	0 - 2	0 - 2	6 - 8
			Normal or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.13 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.13 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.28 U	0.28 U	0.29 U	0.27 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.071 U	0.072 U	0.073 U	0.067 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.071 U	0.072 U	0.073 U	0.067 U
2-Chloronaphthalene	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2-Chlorophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2-Methylnaphthalene	--	--	--	MG/KG	0.35 U	0.014 J	0.36 U	0.33 U
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2-Nitroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
2-Nitrophenol	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.13 U
3-Nitroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.28 U	0.28 U	0.29 U	0.27 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
4-Chloroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
4-Nitroaniline	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
4-Nitrophenol	--	--	--	MG/KG	0.71 U	0.72 U	0.73 U	0.67 U
Acenaphthene	20	100	98	MG/KG	0.35 U	0.12 J	0.36 U	0.33 U
Acenaphthylene	100	100	107	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Acetophenone	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Anthracene	100	100	1000	MG/KG	0.35 U	0.14 J	0.039 J	0.33 U
Atrazine	--	--	--	MG/KG	0.14 UJV	0.14 UJV	0.15 U	0.13 UJV
Benzaldehyde	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.11	0.4	0.16	0.033 U
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.11	0.32	0.15	0.016 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.15	0.44	0.19	0.024 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-14	RXSB-14	RXSB-15	RXSB-15
			Sample Date:		04/24/2018	04/24/2018	04/26/2018	05/01/2018
			Sample Depth (ft bls):		0 - 2	0 - 2	0 - 2	6 - 8
			Normal or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.063 J	0.15 J	0.092 J	0.33 U
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.05	0.16	0.074	0.033 U
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.035 U	0.035 U	0.036 U	0.033 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Caprolactam	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Carbazole	--	--	--	MG/KG	0.35 U	0.065 J	0.02 J	0.33 U
Chrysene	**1**	3.9	1	MG/KG	0.12 J	0.37	0.17 J	0.018 J
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.023 J	0.054	0.031 J	0.033 U
Dibenzofuran	7	59	210	MG/KG	0.35 U	0.03 J	0.36 U	0.33 U
Diethyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Dimethyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.044 J	0.35 U	0.36 U	0.33 U
Fluoranthene	100	100	1000	MG/KG	0.2 J	0.79	0.31 J	0.023 J
Fluorene	30	100	386	MG/KG	0.35 U	0.057 J	0.013 J	0.33 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.035 U	0.035 U	0.036 U	0.033 U
Hexachlorobutadiene	--	--	--	MG/KG	0.071 U	0.072 U	0.073 U	0.067 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Hexachloroethane	--	--	--	MG/KG	0.035 U	0.035 U	0.036 U	0.033 UJV
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.077	0.19	0.11	0.018 J
Isophorone	--	--	--	MG/KG	0.14 U	0.14 U	0.15 U	0.13 U
Naphthalene	12	100	12	MG/KG	0.35 U	0.024 J	0.36 U	0.33 U
Nitrobenzene	--	--	--	MG/KG	0.035 U	0.035 U	0.036 U	0.033 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.035 U	0.035 U	0.036 U	0.033 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.35 U	0.35 U	0.36 U	0.33 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.28 U	0.28 U	0.29 U	0.27 U
Phenanthrene	100	100	1000	MG/KG	0.086 J	0.62	0.17 J	0.33 U
Phenol	0.33	100	0.33	MG/KG	0.35 U	0.016 J	0.36 U	0.33 U
Pyrene	100	100	1000	MG/KG	0.17 J	0.69	0.28 J	0.026 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-16	RXSB-16	RXSB-17	RXSB-17
				Sample Date:	05/29/2018	05/29/2018	05/23/2018	05/23/2018
				Sample Depth (ft bls):	1 - 3	9 - 11	0 - 2	0 - 2
				Normal or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.14 U	0.14 U	0.18 U	0.18 U
2,4-Dichlorophenol	--	--	--	MG/KG	0.14 U	0.14 U	0.18 U	0.18 U
2,4-Dimethylphenol	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2,4-Dinitrophenol	--	--	--	MG/KG	0.27 UJV	0.29 UJV	0.35 U	0.36 U
2,4-Dinitrotoluene	--	--	--	MG/KG	0.069 U	0.073 U	0.089 U	0.091 U
2,6-Dinitrotoluene	--	--	--	MG/KG	0.069 U	0.073 U	0.089 U	0.091 U
2-Chloronaphthalene	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2-Chlorophenol	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2-Methylnaphthalene	--	--	--	MG/KG	0.34 U	0.36 U	0.14 J	0.15 J
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2-Nitroaniline	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
2-Nitrophenol	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.14 U	0.14 U	0.18 U	0.18 U
3-Nitroaniline	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.27 UJV	0.29 UJV	0.35 U	0.36 U
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
4-Chloroaniline	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
4-Nitroaniline	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
4-Nitrophenol	--	--	--	MG/KG	0.69 U	0.73 U	0.89 U	0.91 U
Acenaphthene	20	100	98	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Acenaphthylene	100	100	107	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Acetophenone	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Anthracene	100	100	1000	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Atrazine	--	--	--	MG/KG	0.14 U	0.14 U	0.18 U	0.18 U
Benzaldehyde	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.082	0.025 J	0.028 J	0.052
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.083	0.019 J	0.017 J	0.044 J
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.12	0.027 J	0.031 J	0.069

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-16	RXSB-16	RXSB-17	RXSB-17
				Sample Date:	05/29/2018	05/29/2018	05/23/2018	05/23/2018
				Sample Depth (ft bls):	1 - 3	9 - 11	0 - 2	0 - 2
				Normal or Field Duplicate:	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.072 J	0.36 U	0.44 U	0.028 J
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.042	0.036 U	0.0096 J	0.024 J
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.066 J	0.018 J	0.44 U	0.45 U
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.066 J	0.36 U	0.44 U	0.45 U
Caprolactam	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Carbazole	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Chrysene	**1**	3.9	1	MG/KG	0.082 J	0.02 J	0.028 J	0.065 J
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.018 J	0.036 U	0.044 U	0.045 U
Dibenzofuran	7	59	210	MG/KG	0.34 U	0.36 U	0.024 J	0.031 J
Diethyl Phthalate	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Dimethyl Phthalate	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Di-N-Octylphthalate	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Fluoranthene	100	100	1000	MG/KG	0.13 J	0.038 J	0.04 J	0.093 J
Fluorene	30	100	386	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
Hexachlorobutadiene	--	--	--	MG/KG	0.069 U	0.073 U	0.089 U	0.091 U
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Hexachloroethane	--	--	--	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.075	0.016 J	0.044 U	0.034 J
Isophorone	--	--	--	MG/KG	0.14 U	0.14 U	0.18 U	0.18 U
Naphthalene	12	100	12	MG/KG	0.34 U	0.36 U	0.11 J	0.11 J
Nitrobenzene	--	--	--	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.27 U	0.29 U	0.35 U	0.36 U
Phenanthrene	100	100	1000	MG/KG	0.062 J	0.024 J	0.061 J	0.1 J
Phenol	0.33	100	0.33	MG/KG	0.34 U	0.36 U	0.44 U	0.45 U
Pyrene	100	100	1000	MG/KG	0.12 J	0.031 J	0.037 J	0.086 J

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-17	RXTGW-12	RXTGW-12
				Sample Date:	05/23/2018	05/24/2018	05/24/2018
				Sample Depth (ft bls):	5 - 7	0 - 2	4 - 6
				Normal or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit			
1,2,4,5-Tetrachlorobenzene	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
2,3,4,6-Tetrachlorophenol	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
2,4,5-Trichlorophenol	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
2,4,6-Trichlorophenol	--	--	--	MG/KG	0.15 U	0.15 UJV	0.15 UJV
2,4-Dichlorophenol	--	--	--	MG/KG	0.15 U	0.15 U	0.15 UJV
2,4-Dimethylphenol	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
2,4-Dinitrophenol	--	--	--	MG/KG	0.3 U	0.31 UJV	0.3 UJV
2,4-Dinitrotoluene	--	--	--	MG/KG	0.074 U	0.078 U	0.075 UJV
2,6-Dinitrotoluene	--	--	--	MG/KG	0.074 U	0.078 U	0.075 UJV
2-Chloronaphthalene	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
2-Chlorophenol	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
2-Methylnaphthalene	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
2-Methylphenol (O-Cresol)	0.33	100	0.33	MG/KG	0.37 U	0.38 U	0.37 UJV
2-Nitroaniline	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
2-Nitrophenol	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
3,3'-Dichlorobenzidine	--	--	--	MG/KG	0.15 U	0.15 U	0.15 UJV
3-Nitroaniline	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
4,6-Dinitro-2-Methylphenol	--	--	--	MG/KG	0.3 U	0.31 UJV	0.3 UJV
4-Bromophenyl Phenyl Ether	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
4-Chloro-3-Methylphenol	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
4-Chloroaniline	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
4-Chlorophenyl Phenyl Ether	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
4-Methylphenol (P-Cresol)	0.33	100	0.33	MG/KG	0.37 U	0.38 UJV	0.37 UJV
4-Nitroaniline	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
4-Nitrophenol	--	--	--	MG/KG	0.74 U	0.78 UJV	0.75 UJV
Acenaphthene	20	100	98	MG/KG	0.37 U	0.38 U	0.37 UJV
Acenaphthylene	100	100	107	MG/KG	0.37 U	0.38 U	0.37 UJV
Acetophenone	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
Anthracene	100	100	1000	MG/KG	0.077 J	0.38 U	0.37 UJV
Atrazine	--	--	--	MG/KG	0.15 U	0.15 U	0.15 UJV
Benzaldehyde	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
Benzo(A)Anthracene	**1**	1	1	MG/KG	0.47	0.038 U	0.037 UJV
Benzo(A)Pyrene	**1**	1	22	MG/KG	0.45	0.038 U	0.037 UJV
Benzo(B)Fluoranthene	**1**	1	1.7	MG/KG	0.61	0.038 UJV	0.037 UJV

Table 3. Summary of Semivolatile Organic Compounds in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXSB-17	RXTGW-12	RXTGW-12
				Sample Date:	05/23/2018	05/24/2018	05/24/2018
				Sample Depth (ft bls):	5 - 7	0 - 2	4 - 6
				Normal or Field Duplicate:	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit			
Benzo(G,H,I)Perylene	100	100	1000	MG/KG	0.27 J	0.38 U	0.37 UJV
Benzo(K)Fluoranthene	0.8	3.9	1.7	MG/KG	0.23	0.038 U	0.037 UJV
Benzyl Butyl Phthalate	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Biphenyl (Diphenyl)	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Bis(2-Chloroethoxy) Methane	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	--	MG/KG	0.037 U	0.038 UJV	0.037 UJV
Bis(2-Chloroisopropyl) Ether	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
Bis(2-Ethylhexyl) Phthalate	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Caprolactam	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Carbazole	--	--	--	MG/KG	0.016 J	0.38 U	0.37 UJV
Chrysene	**1**	3.9	1	MG/KG	0.45	0.38 U	0.37 UJV
Dibenz(A,H)Anthracene	0.33	0.33	1000	MG/KG	0.066	0.038 U	0.037 UJV
Dibenzofuran	7	59	210	MG/KG	0.37 U	0.38 U	0.37 UJV
Diethyl Phthalate	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Dimethyl Phthalate	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Di-N-Butyl Phthalate	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Di-N-Octylphthalate	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Fluoranthene	100	100	1000	MG/KG	0.83	0.38 U	0.37 UJV
Fluorene	30	100	386	MG/KG	0.37 U	0.38 U	0.37 UJV
Hexachlorobenzene	0.33	1.2	3.2	MG/KG	0.037 U	0.038 U	0.037 UJV
Hexachlorobutadiene	--	--	--	MG/KG	0.074 U	0.078 UJV	0.075 UJV
Hexachlorocyclopentadiene	--	--	--	MG/KG	0.37 U	0.38 UJV	0.37 UJV
Hexachloroethane	--	--	--	MG/KG	0.037 U	0.038 UJV	0.037 UJV
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	8.2	MG/KG	0.33	0.038 U	0.037 UJV
Isophorone	--	--	--	MG/KG	0.15 U	0.15 UJV	0.15 UJV
Naphthalene	12	100	12	MG/KG	0.37 U	0.38 UJV	0.37 UJV
Nitrobenzene	--	--	--	MG/KG	0.037 U	0.038 U	0.037 UJV
N-Nitrosodi-N-Propylamine	--	--	--	MG/KG	0.037 U	0.038 UJV	0.037 UJV
N-Nitrosodiphenylamine	--	--	--	MG/KG	0.37 U	0.38 U	0.37 UJV
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.3 U	0.31 UJV	0.3 UJV
Phenanthrene	100	100	1000	MG/KG	0.13 J	0.38 U	0.37 UJV
Phenol	0.33	100	0.33	MG/KG	0.37 U	0.38 UJV	0.37 UJV
Pyrene	100	100	1000	MG/KG	0.75	0.38 U	0.37 UJV

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-1	RXMW-1	RXMW-10	RXMW-10	RXMW-11
			Sample Date:		06/14/2018	06/15/2018	04/23/2018	04/23/2018	04/23/2018
			Sample Depth (ft bls):		0 - 2	7 - 9	0 - 2	2 - 4	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	8220	11100	18900	24400	12700
Antimony	--	--	--	MG/KG	1.1 UJV	0.92 U	1.1 U	1.1 UJV	0.99 U
Arsenic	**13**	16	16	MG/KG	**14.1**	0.63 J	1.9	1.5	0.58 J
Barium	**350**	400	820	MG/KG	295 JV	121	**419**	**489**	111
Beryllium	**7.2**	72	47	MG/KG	0.65	0.34 J	0.53	0.68	0.6
Cadmium	2.5	4.3	7.5	MG/KG	0.39 J	0.92 U	1.1 U	1.1 U	0.99 U
Calcium	--	--	--	MG/KG	8350	1630	6370	5180	2030
Chromium, Hexavalent	**1**	110	19	MG/KG	2.3 U	2.2 U	2.3 U	2.2 U	2.1 U
Chromium, Total	**30**	180	--	MG/KG	15.3	29.5	**38.1**	**46.4**	**30.1**
Cobalt	--	--	--	MG/KG	7.5	11.2	15.4	17.9	22.2
Copper	**50**	270	1720	MG/KG	46.3	39.8	**58.9**	**57.6**	48.3
Cyanide	27	27	40	MG/KG	0.13 J+V	0.24 U	0.26 U	0.26 U	0.23 U
Iron	--	--	--	MG/KG	17700	23600	30300	34900	24900
Lead	**63**	400	450	MG/KG	**69.9**	4.6	12.7	9.2	7.3
Magnesium	--	--	--	MG/KG	2320 JV	5080	9770	11200	6040
Manganese	1600	2000	2000	MG/KG	289	226	343	339	197
Mercury	**0.18**	0.81	0.73	MG/KG	0.14 JV	0.017 U	0.076	0.018 U	0.017 U
Nickel	**30**	310	130	MG/KG	18.3	25.4	**36.7**	**41.9**	**34.7**
Potassium	--	--	--	MG/KG	1710	6650	7790	9120	7670
Selenium	3.9	180	4	MG/KG	1.9 J	4.6 U	5.5 U	5.6 U	5 U
Silver	2	180	8.3	MG/KG	1.1 U	0.92 U	1.1 U	1.1 U	0.99 U
Sodium	--	--	--	MG/KG	567	394	303	357	130
Thallium	--	--	--	MG/KG	0.55	0.32 J	0.45	0.51	0.47
Vanadium	--	--	--	MG/KG	30.7	31.7	75.3	88.2	35.7
Zinc	**109**	10000	2480	MG/KG	109 JV	60.3	78.9	80.4	101

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-11	RXMW-2	RXMW-2	RXMW-3	RXMW-4
			Sample Date:		04/27/2018	06/15/2018	06/15/2018	05/25/2018	04/24/2018
			Sample Depth (ft bls):		11 - 13	0 - 2	13 - 15	1 - 3	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	11100	7160	10500	13600	9900
Antimony	--	--	--	MG/KG	1.1 U	1.1 U	1.1 U	0.3 J	0.82 J
Arsenic	**13**	16	16	MG/KG	1.1 U	4.8	1.2	2.9	2.2
Barium	**350**	400	820	MG/KG	71.1	95.4	125	**379**	161
Beryllium	**7.2**	72	47	MG/KG	0.45	0.36 J	0.44	0.6	3
Cadmium	2.5	4.3	7.5	MG/KG	1.1 U	1.1 U	1.1 U	0.92 U	0.42 J
Calcium	--	--	--	MG/KG	436	8850	1420	23900	21600
Chromium, Hexavalent	**1**	110	19	MG/KG	2.2 U	2.1 U	**1.1 J**	2.3 U	2.1 U
Chromium, Total	**30**	180	--	MG/KG	25.3	14.3	23.8	**42.4**	**66.4**
Cobalt	--	--	--	MG/KG	13.2	6.8	10.4	13.8	32.5
Copper	**50**	270	1720	MG/KG	34.4	24	36.5	**60.6**	**468**
Cyanide	27	27	40	MG/KG	9.1E-06 U	0.25 U	0.23 U	0.071 J	0.26 U
Iron	--	--	--	MG/KG	18400	13900	21500	26400	44600
Lead	**63**	400	450	MG/KG	4.7	**72.5**	5.9	16.4	**486**
Magnesium	--	--	--	MG/KG	5810	2580	4750	8210	13500
Manganese	1600	2000	2000	MG/KG	151	224	125	308	580
Mercury	**0.18**	0.81	0.73	MG/KG	0.017 U	**0.34**	0.019 U	0.019 U	0.039
Nickel	**30**	310	130	MG/KG	**31**	14.9	27.5	**30.8**	**67.2**
Potassium	--	--	--	MG/KG	8040	2170	6480	7650	3730
Selenium	3.9	180	4	MG/KG	0.33 J	5.3 U	5.3 U	0.75 J	5.3 U
Silver	2	180	8.3	MG/KG	1.1 U	1.1 U	1.1 U	0.92 U	1.1 U
Sodium	--	--	--	MG/KG	88.2 J	376	118	462	455
Thallium	--	--	--	MG/KG	0.47	0.17 J	0.36 J	0.28 J	0.19 J
Vanadium	--	--	--	MG/KG	37.8	25.9	29.3	41.6	30.4
Zinc	**109**	10000	2480	MG/KG	72.3	68.4	74.7	95.5	**3460**

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-4	RXMW-5	RXMW-5	RXMW-6	RXMW-6
			Sample Date:		05/01/2018	04/26/2018	05/02/2018	04/25/2018	04/27/2018
			Sample Depth (ft bls):		13 - 15	0 - 2	12 - 14	0 - 2	9 - 11
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	19500	7910	17400	2800	12600
Antimony	--	--	--	MG/KG	1.1 U	1 U	1 U	0.74 J	1.1 UJV
Arsenic	**13**	16	16	MG/KG	0.6 J	3	0.77 J	7.8	1.1 U
Barium	**350**	400	820	MG/KG	224	198	254	81.6	125
Beryllium	**7.2**	72	47	MG/KG	1	0.83	1.2	1.3	0.98
Cadmium	2.5	4.3	7.5	MG/KG	0.4 J	1 U	1 U	1.1 U	1.1 U
Calcium	--	--	--	MG/KG	5050	52600	2150	153000	2990
Chromium, Hexavalent	**1**	110	19	MG/KG	2.2 U	2.3 U	2.2 U	2.1 U	2.2 U
Chromium, Total	**30**	180	--	MG/KG	**35.6**	22	**32.9**	22	27
Cobalt	--	--	--	MG/KG	15.3	10.9	14.2	13.6	11.7 JV
Copper	**50**	270	1720	MG/KG	**70.4**	**93**	46.4	**219**	7.8 JV
Cyanide	27	27	40	MG/KG	0.24 UV	0.24 U	0.24 U	0.26 U	0.26 U
Iron	--	--	--	MG/KG	37200	19400	38100	17600	25900
Lead	**63**	400	450	MG/KG	27.9	**170**	12.1	**173**	14.6 JV
Magnesium	--	--	--	MG/KG	7890	19800	5660	54700	5520
Manganese	1600	2000	2000	MG/KG	333	459	526	252	309
Mercury	**0.18**	0.81	0.73	MG/KG	0.017 U	0.031	0.017 U	0.012 J	0.017 U
Nickel	**30**	310	130	MG/KG	**31.4**	22.6	**30.1**	29.7	23.5 JV
Potassium	--	--	--	MG/KG	11400	2710	10300	588	8240
Selenium	3.9	180	4	MG/KG	5.5 U	5.2 U	5.2 U	5.3 U	5.3 U
Silver	2	180	8.3	MG/KG	1.1 U	1 U	1 U	1.1 U	1.1 U
Sodium	--	--	--	MG/KG	167	190	110	261	99.7 J
Thallium	--	--	--	MG/KG	0.65	0.18 J	0.44	0.43 U	0.34 J
Vanadium	--	--	--	MG/KG	47.4	27.1	43.8	10.2	32.2
Zinc	**109**	10000	2480	MG/KG	**188**	**666**	75.7	**1510**	98.5 JV

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-7	RXMW-7	RXMW-7	RXMW-8	RXMW-8
			Sample Date:		06/14/2018	06/15/2018	06/15/2018	05/29/2018	05/29/2018
			Sample Depth (ft bls):		0 - 2	12 - 14	12 - 14	1 - 3	9 - 11
			Normal or Field Duplicate:		N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	5320	13700	13800	6840	15000
Antimony	--	--	--	MG/KG	0.44 J	1 U	1 U	3.3	0.89 U
Arsenic	**13**	16	16	MG/KG	2	1 U	1 U	7.4	0.75 J
Barium	**350**	400	820	MG/KG	80.9	149	148	139	246
Beryllium	**7.2**	72	47	MG/KG	3.3	0.85	0.85	2.2	1.9
Cadmium	2.5	4.3	7.5	MG/KG	1.1 U	1 U	1 U	0.81 U	0.89 U
Calcium	--	--	--	MG/KG	28500	2150	2050	5180	3950
Chromium, Hexavalent	**1**	110	19	MG/KG	2.2 U	2.3 U	2.3 U	2.2 U	2.2 U
Chromium, Total	**30**	180	--	MG/KG	29.4	27.1	27.5	**71.1**	**41.3**
Cobalt	--	--	--	MG/KG	16.7	16.8	14.4	37	17.4
Copper	**50**	270	1720	MG/KG	**299**	50	39.3	**549**	**113**
Cyanide	27	27	40	MG/KG	0.26 U	0.23 U	0.27 U	0.25 U	0.26 U
Iron	--	--	--	MG/KG	17500	25100	25000	238000	35100
Lead	**63**	400	450	MG/KG	**313**	10.5	10	**390**	**102**
Magnesium	--	--	--	MG/KG	11300	5480	5470	4380	5870
Manganese	1600	2000	2000	MG/KG	231	143	142	902	132
Mercury	**0.18**	0.81	0.73	MG/KG	0.031	0.019 U	0.019 U	0.02	0.018 U
Nickel	**30**	310	130	MG/KG	**43.3**	25.5	24.3	**106**	**40.8**
Potassium	--	--	--	MG/KG	1540	10500	10500	3250	10200
Selenium	3.9	180	4	MG/KG	5.4 U	5.2 U	5.2 U	4.1 U	4.4 U
Silver	2	180	8.3	MG/KG	1.1 U	1 U	1 U	0.81 U	0.89 U
Sodium	--	--	--	MG/KG	269	107	106	1950	608
Thallium	--	--	--	MG/KG	0.44 U	0.43	0.42	0.14 J	0.47
Vanadium	--	--	--	MG/KG	16.5	36.6	36	20.3	38.3
Zinc	**109**	10000	2480	MG/KG	**2760**	65.8	67.2	**2920**	**840**

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-9	RXMW-9	RXSB-11	RXSB-11	RXSB-12
			Sample Date:		04/23/2018	04/25/2018	04/23/2018	04/26/2018	04/23/2018
			Sample Depth (ft bls):		0 - 2	5 - 7	0 - 2	3 - 5	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	9210	15200	5220	17800	11300
Antimony	--	--	--	MG/KG	0.52 J	0.72 J	0.97 U	1.1 U	1.1 U
Arsenic	**13**	16	16	MG/KG	3.4	1.1	3.9	1.1 U	2
Barium	**350**	400	820	MG/KG	124	186	67.7	191	142
Beryllium	**7.2**	72	47	MG/KG	6.3	1.2	0.33 J	1.1	0.55
Cadmium	2.5	4.3	7.5	MG/KG	1.1 U	1.1 U	0.97 U	1.1 U	1.1 U
Calcium	--	--	--	MG/KG	31100	10700	100000	3310	48000
Chromium, Hexavalent	**1**	110	19	MG/KG	2.2 U	2.2 U	2.1 U	2.1 U	2.1 U
Chromium, Total	**30**	180	--	MG/KG	**39.6**	**51.1**	15.2	**33.3**	27.1
Cobalt	--	--	--	MG/KG	23	20.1	5.7	17.1	11
Copper	**50**	270	1720	MG/KG	**242**	**481**	31.1	**59.1**	38.5
Cyanide	27	27	40	MG/KG	0.27 UJV	0.26 U	0.25 U	0.063 J	0.24 U
Iron	--	--	--	MG/KG	25700	36800	11600	27200	20400
Lead	**63**	400	450	MG/KG	**306**	**163**	38.6	9.5	11.9
Magnesium	--	--	--	MG/KG	20200	8020	59700	7590	30900
Manganese	1600	2000	2000	MG/KG	461	627	186	235	164
Mercury	**0.18**	0.81	0.73	MG/KG	0.046	0.018 U	0.026	0.018 U	0.018 U
Nickel	**30**	310	130	MG/KG	**39.8**	**48.5**	14.7	**37.8**	23.3
Potassium	--	--	--	MG/KG	2840	4950	2680	8640	6900
Selenium	3.9	180	4	MG/KG	5.5 U	0.32 J	4.9 U	5.4 U	5.4 U
Silver	2	180	8.3	MG/KG	1.1 U	1.1 U	0.97 U	1.1 U	1.1 U
Sodium	--	--	--	MG/KG	274	365	151	176	136
Thallium	--	--	--	MG/KG	0.21 J	0.25 J	0.19 J	0.42 J	0.33 J
Vanadium	--	--	--	MG/KG	30.6	40.5	19	58.9	34.4
Zinc	**109**	10000	2480	MG/KG	**2330**	**1050**	91.7	63.1	71.3

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-12	RXSB-13	RXSB-13	RXSB-14	RXSB-14
			Sample Date:		04/26/2018	04/24/2018	04/26/2018	04/24/2018	04/24/2018
			Sample Depth (ft bls):		6 - 8	0 - 2	13 - 15	0 - 2	0 - 2
			Normal or Field Duplicate:		N	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	33400	15500	12400	13600	14400
Antimony	--	--	--	MG/KG	2.7 U	0.52 J	1 U	1 U	1 U
Arsenic	**13**	16	16	MG/KG	1.2 J	7.7	0.77 J	0.74 J	0.9 J
Barium	**350**	400	820	MG/KG	220	**630**	147	188	233
Beryllium	**7.2**	72	47	MG/KG	1.5	1.1	0.7	0.59	0.75
Cadmium	2.5	4.3	7.5	MG/KG	2.7 U	0.82 J	1 U	1 U	1 U
Calcium	--	--	--	MG/KG	3390	50100	1590	10300	9700
Chromium, Hexavalent	**1**	110	19	MG/KG	2.3 U	2.4 U	2.2 U	2.1 U	2.1 U
Chromium, Total	**30**	180	--	MG/KG	**102**	**55.7**	**34.5**	25.2	26.8
Cobalt	--	--	--	MG/KG	99.6	12.4	18.3	11.3	12
Copper	**50**	270	1720	MG/KG	**2100**	**121**	46	47.1	**53.8**
Cyanide	27	27	40	MG/KG	0.26 U	0.29 U	0.24 U	0.27 U	0.12 J
Iron	--	--	--	MG/KG	73400	28900	26800	26100	26900
Lead	**63**	400	450	MG/KG	9.7	**424**	7.1	27.4	37.2
Magnesium	--	--	--	MG/KG	20800	11400	6580	9300	8410
Manganese	1600	2000	2000	MG/KG	373	390	292	155	179
Mercury	**0.18**	0.81	0.73	MG/KG	0.019 U	**0.65**	0.017 U	0.017 U	0.018 U
Nickel	**30**	310	130	MG/KG	**85.7**	27.2	**44.7**	23.5	24.4
Potassium	--	--	--	MG/KG	11700	3020	7370	7950	8250
Selenium	3.9	180	4	MG/KG	2.7 J	0.33 J	5.2 U	5.1 U	5.1 U
Silver	2	180	8.3	MG/KG	2.7 U	1.1 U	1 U	1 U	1 U
Sodium	--	--	--	MG/KG	201 J	913	190	102 J	121
Thallium	--	--	--	MG/KG	0.53 J	0.23 J	0.71	0.31 J	0.32 J
Vanadium	--	--	--	MG/KG	117	44.3	42.5	32.5	34.7
Zinc	**109**	10000	2480	MG/KG	**269**	**899**	84.1	104	**128**

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-15	RXSB-15	RXSB-16	RXSB-16	RXSB-17
			Sample Date:		04/26/2018	05/01/2018	05/29/2018	05/29/2018	05/23/2018
			Sample Depth (ft bls):		0 - 2	6 - 8	1 - 3	9 - 11	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	7210	13800	14500	11800	13300
Antimony	--	--	--	MG/KG	1 U	0.94 U	8.8 JV	2.1 J	0.6 J
Arsenic	**13**	16	16	MG/KG	3	0.85 J	3.6	2.3	**55.7**
Barium	**350**	400	820	MG/KG	108	142	**855**	343	**382**
Beryllium	**7.2**	72	47	MG/KG	0.51	0.43	**20.2**	6.2	1.5
Cadmium	2.5	4.3	7.5	MG/KG	1 U	0.94 U	8 UJV	4.1 U	1 U
Calcium	--	--	--	MG/KG	59700	11600	8270	6200	10700
Chromium, Hexavalent	**1**	110	19	MG/KG	2.2 U	2 U	0.66 J	2.2 U	2.6 U
Chromium, Total	**30**	180	--	MG/KG	17.7	27.5	**344**	**133**	24.9
Cobalt	--	--	--	MG/KG	7.9	10.7	229	71.8	10
Copper	**50**	270	1720	MG/KG	21.5	4.3	**4840**	**1170**	**94.2**
Cyanide	27	27	40	MG/KG	0.26 U	0.24 U	0.22 U	0.24 U	0.26 U
Iron	--	--	--	MG/KG	16400	25400	165000	69200	38600
Lead	**63**	400	450	MG/KG	26.3	6.7	**4010**	**972**	**96.9**
Magnesium	--	--	--	MG/KG	12000	10000	8940	6050	4070
Manganese	1600	2000	2000	MG/KG	356	209	1240	531	165
Mercury	**0.18**	0.81	0.73	MG/KG	0.015 J	0.016 U	0.13	0.088	0.093
Nickel	**30**	310	130	MG/KG	15.8	22.1	**487**	**148**	25
Potassium	--	--	--	MG/KG	3060	8560	1900	5730	1070
Selenium	3.9	180	4	MG/KG	5.1 U	4.7 U	0.72 J	4.1 U	3.4 J
Silver	2	180	8.3	MG/KG	1 U	0.94 U	8 U	4.1 U	1 U
Sodium	--	--	--	MG/KG	139	137	2830	908	435
Thallium	--	--	--	MG/KG	0.17 J	0.36 J	0.32 U	0.24 J	0.54
Vanadium	--	--	--	MG/KG	21.6	32.7	31.4	29.3	50.8
Zinc	**109**	10000	2480	MG/KG	**114**	65.2	**36000**	**9030**	**671**

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:	RXSB-17	RXSB-17	RXSB-3A	RXSB-3A	RXSB-3A
			Sample Date:	05/23/2018	05/23/2018	05/22/2018	05/22/2018	05/22/2018
			Sample Depth (ft bls):	0 - 2	5 - 7	0 - 2	2 - 4	4 - 6
			Normal or Field Duplicate:	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Aluminum	--	--	--	MG/KG	17000	10700	9430	9330	8920
Antimony	--	--	--	MG/KG	0.37 J	0.26 J	0.3 J	0.87 U	0.87 U
Arsenic	**13**	16	16	MG/KG	**37.8**	2.2	4.2	2.5	1.4
Barium	**350**	400	820	MG/KG	297	160	109	112	86.2
Beryllium	**7.2**	72	47	MG/KG	1.4	4	1.3	0.53	0.52
Cadmium	2.5	4.3	7.5	MG/KG	1.1 U	0.87 U	0.89 U	0.87 U	0.87 U
Calcium	--	--	--	MG/KG	12100	13900	26400	24700	17200
Chromium, Hexavalent	**1**	110	19	MG/KG	2.7 U	2.2 U	NA	NA	NA
Chromium, Total	**30**	180	--	MG/KG	**31.2**	**35.9**	28.4	20.8	20.7
Cobalt	--	--	--	MG/KG	10.2	13.8	13	8.1	8.3
Copper	**50**	270	1720	MG/KG	**80**	**143**	**148**	30.4	21.1
Cyanide	27	27	40	MG/KG	0.091 J	0.22 U	NA	NA	NA
Iron	--	--	--	MG/KG	34100	23000	20700	17500	16900
Lead	**63**	400	450	MG/KG	**88.9**	**169**	**179**	59	23.9
Magnesium	--	--	--	MG/KG	4920	9700	13700	12600	10900
Manganese	1600	2000	2000	MG/KG	192	336	371	334	403
Mercury	**0.18**	0.81	0.73	MG/KG	0.11	0.031	0.077	0.034	0.025
Nickel	**30**	310	130	MG/KG	24.8	**40.6**	**31.3**	16.3	15.8
Potassium	--	--	--	MG/KG	1570	3330	2660	2910	3020
Selenium	3.9	180	4	MG/KG	1.9 J	4.3 U	0.33 J	4.4 U	4.4 U
Silver	2	180	8.3	MG/KG	1.1 U	0.87 U	0.89 U	0.87 U	0.87 U
Sodium	--	--	--	MG/KG	361	172	217	122	90.1
Thallium	--	--	--	MG/KG	0.44	0.21 J	0.2 J	0.19 J	0.18 J
Vanadium	--	--	--	MG/KG	45	29.8	30.7	28.1	26.7
Zinc	**109**	10000	2480	MG/KG	**448**	**1030**	**1240**	91.8	58.9

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:	RXSB-3AE	RXSB-3AE	RXSB-3AE	RXSB-3AN	RXSB-3AN
			Sample Date:	05/22/2018	05/22/2018	05/22/2018	05/22/2018	05/22/2018
			Sample Depth (ft bls):	0 - 2	2 - 4	4 - 6	0 - 2	2 - 4
			Normal or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	11700	8780	8900	13600	13300
Antimony	--	--	--	MG/KG	1.7	0.95	0.9 U	0.95 U	1
Arsenic	**13**	16	16	MG/KG	**36.9**	6.7	1.7	**20.3**	12.9
Barium	**350**	400	820	MG/KG	244	194	81.8	139	137
Beryllium	**7.2**	72	47	MG/KG	2.8	3.8	0.49	1.8	3.6
Cadmium	2.5	4.3	7.5	MG/KG	0.56 J	0.84 U	0.9 U	0.95 U	1 U
Calcium	--	--	--	MG/KG	13500	15200	15500	4840	7870
Chromium, Hexavalent	**1**	110	19	MG/KG	NA	NA	NA	NA	NA
Chromium, Total	**30**	180	--	MG/KG	**35.9**	**44**	21.2	23	**45.8**
Cobalt	--	--	--	MG/KG	18.8	28.5	8.4	10.8	26.6
Copper	**50**	270	1720	MG/KG	**1170**	**457**	29.4	**86.3**	**524**
Cyanide	27	27	40	MG/KG	NA	NA	NA	NA	NA
Iron	--	--	--	MG/KG	44400	30200	17700	19800	29600
Lead	**63**	400	450	MG/KG	**338**	**481**	25	**129**	**604**
Magnesium	--	--	--	MG/KG	3540	9500	10500	3360	4200
Manganese	1600	2000	2000	MG/KG	238	414	362	329	357
Mercury	**0.18**	0.81	0.73	MG/KG	0.12	0.11	0.033	0.12	0.12
Nickel	**30**	310	130	MG/KG	**75.1**	**64.6**	16.5	28.5	**70.2**
Potassium	--	--	--	MG/KG	1440	2010	2970	2050	1170
Selenium	3.9	180	4	MG/KG	1.9 J	0.37 J	4.5 U	0.9 J	0.7 J
Silver	2	180	8.3	MG/KG	0.94 U	0.84 U	0.9 U	0.95 U	1 U
Sodium	--	--	--	MG/KG	372	345	92.8	148	303
Thallium	--	--	--	MG/KG	2.3	0.2 J	0.19 J	0.56	0.16 J
Vanadium	--	--	--	MG/KG	50.8	27	27.4	34.1	27.4
Zinc	**109**	10000	2480	MG/KG	**3010**	**3840**	79	**569**	**4410**

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-3AN	RXSB-3AS	RXSB-3AS	RXSB-3AS	RXSB-3AW
			Sample Date:		05/22/2018	05/22/2018	05/22/2018	05/22/2018	05/22/2018
			Sample Depth (ft bls):		4 - 6	0 - 2	2 - 4	4 - 6	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
Aluminum	--	--	--	MG/KG	8030	14300	16000	11800	13600
Antimony	--	--	--	MG/KG	0.7 J	0.97 U	1.2 U	0.9 U	0.97 U
Arsenic	**13**	16	16	MG/KG	1.7	**14.7**	11.6	2.5	**40.4**
Barium	**350**	400	820	MG/KG	121	92.1	61.6	113	337
Beryllium	**7.2**	72	47	MG/KG	2.3	0.64	0.65	0.62	0.99
Cadmium	2.5	4.3	7.5	MG/KG	0.83 U	0.97 U	1.2 U	0.9 U	0.97 U
Calcium	--	--	--	MG/KG	20500	10700	3000	4800	5480
Chromium, Hexavalent	**1**	110	19	MG/KG	NA	NA	NA	NA	NA
Chromium, Total	**30**	180	--	MG/KG	**39.7**	21.5	19.4	24.8	19.9
Cobalt	--	--	--	MG/KG	20.5	7	8.3	10.3	10.7
Copper	**50**	270	1720	MG/KG	**323**	**60.6**	**92.1**	35.8	**92.7**
Cyanide	27	27	40	MG/KG	NA	NA	NA	NA	NA
Iron	--	--	--	MG/KG	23100	18400	18700	20600	30800
Lead	**63**	400	450	MG/KG	**382**	**64**	**113**	**67.5**	49.2
Magnesium	--	--	--	MG/KG	12500	6220	3000	6120	1900
Manganese	1600	2000	2000	MG/KG	399	219	180	445	497
Mercury	**0.18**	0.81	0.73	MG/KG	0.067	0.069	0.071	0.026	0.15
Nickel	**30**	310	130	MG/KG	**47.6**	16.5	20.3	20	19.5
Potassium	--	--	--	MG/KG	2220	1310	1330	3620	1330
Selenium	3.9	180	4	MG/KG	4.1 U	0.88 J	0.94 J	0.31 J	2.5 J
Silver	2	180	8.3	MG/KG	0.83 U	0.97 U	1.2 U	0.9 U	0.97 U
Sodium	--	--	--	MG/KG	230	114	67.2 J	97	258
Thallium	--	--	--	MG/KG	0.14 J	0.25 J	0.21 J	0.24 J	0.86
Vanadium	--	--	--	MG/KG	24.2	32.6	26.8	33.6	58.9
Zinc	**109**	10000	2480	MG/KG	**2330**	**322**	**708**	**140**	98.8

Table 4. Summary of Metals in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-3AW	RXSB-3AW	RXTGW-12	RXTGW-12
			Sample Date:		05/22/2018	05/22/2018	05/24/2018	05/24/2018
			Sample Depth (ft bls):		2 - 4	4 - 6	0 - 2	4 - 6
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
Aluminum	--	--	--	MG/KG	4850	7860	7110	5550
Antimony	--	--	--	MG/KG	0.81 U	0.89 U	0.86 U	0.82 UJV
Arsenic	**13**	16	16	MG/KG	1.5	1.5	3.5	0.91
Barium	**350**	400	820	MG/KG	48.1	75.8	81.7	46.3
Beryllium	**7.2**	72	47	MG/KG	0.4	0.41	1.4	0.58
Cadmium	2.5	4.3	7.5	MG/KG	0.81 U	0.89 U	0.86 U	0.82 U
Calcium	--	--	--	MG/KG	17200	17000	63700	57800
Chromium, Hexavalent	**1**	110	19	MG/KG	NA	NA	2.3 U	2.2 U
Chromium, Total	**30**	180	--	MG/KG	14.9	17.6	16.7	14
Cobalt	--	--	--	MG/KG	5.7	6.7	9.3	6.3
Copper	**50**	270	1720	MG/KG	18.8	19.7	22.8	12
Cyanide	27	27	40	MG/KG	NA	NA	0.28 U	0.23 UV
Iron	--	--	--	MG/KG	11400	14900	20200	13000
Lead	**63**	400	450	MG/KG	18.8	20.1	13.3	3.5
Magnesium	--	--	--	MG/KG	10600	10800	34100	30300
Manganese	1600	2000	2000	MG/KG	268	338	537	360
Mercury	**0.18**	0.81	0.73	MG/KG	0.018	0.023	0.015 J	0.017 U
Nickel	**30**	310	130	MG/KG	10.7	13.3	13.8	10.9
Potassium	--	--	--	MG/KG	1250	2650	2210	1520
Selenium	3.9	180	4	MG/KG	4 U	4.5 U	4.3 U	0.27 J
Silver	2	180	8.3	MG/KG	0.81 U	0.89 U	0.86 U	0.82 U
Sodium	--	--	--	MG/KG	55.8 J	77.8 J	146	141
Thallium	--	--	--	MG/KG	0.1 J	0.16 J	0.35 U	0.33 U
Vanadium	--	--	--	MG/KG	15.2	22.6	26.3	19.6
Zinc	**109**	10000	2480	MG/KG	88.5	48.2	108	45.2

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-1	RXMW-1	RXMW-10	RXMW-10	RXMW-11
			Sample Date:		06/14/2018	06/15/2018	04/23/2018	04/23/2018	04/23/2018
			Sample Depth (ft bls):		0 - 2	7 - 9	0 - 2	2 - 4	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.078 U	0.072 U	0.076 U	0.075 U	0.071 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-11	RXMW-2	RXMW-2	RXMW-3	RXMW-4
			Sample Date:		04/27/2018	06/15/2018	06/15/2018	05/25/2018	04/24/2018
			Sample Depth (ft bls):		11 - 13	0 - 2	13 - 15	1 - 3	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.072 U	0.074 U	0.073 U	0.079 U	0.073 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-4	RXMW-5	RXMW-5	RXMW-6	RXMW-6
			Sample Date:		05/01/2018	04/26/2018	05/02/2018	04/25/2018	04/27/2018
			Sample Depth (ft bls):		13 - 15	0 - 2	12 - 14	0 - 2	9 - 11
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.073 U	0.075 U	0.073 U	0.072 U	0.074 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-7	RXMW-7	RXMW-7	RXMW-8	RXMW-8
			Sample Date:		06/14/2018	06/15/2018	06/15/2018	05/29/2018	05/29/2018
			Sample Depth (ft bls):		0 - 2	12 - 14	12 - 14	1 - 3	9 - 11
			Normal or Field Duplicate:		N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.075 U	0.078 U	0.078 U	0.073 U	0.074 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-9	RXMW-9	RXSB-11	RXSB-11	RXSB-12
			Sample Date:		04/23/2018	04/25/2018	04/23/2018	04/26/2018	04/23/2018
			Sample Depth (ft bls):		0 - 2	5 - 7	0 - 2	3 - 5	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U	0.073 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-12	RXSB-13	RXSB-13	RXSB-14	RXSB-14
			Sample Date:		04/26/2018	04/24/2018	04/26/2018	04/24/2018	04/24/2018
			Sample Depth (ft bls):		6 - 8	0 - 2	13 - 15	0 - 2	0 - 2
			Normal or Field Duplicate:		N	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.077 U	0.08 U	0.074 U	0.072 U	0.072 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-15	RXSB-15	RXSB-16	RXSB-16	RXSB-17
			Sample Date:		04/26/2018	05/01/2018	05/29/2018	05/29/2018	05/23/2018
			Sample Depth (ft bls):		0 - 2	6 - 8	1 - 3	9 - 11	0 - 2
			Normal or Field Duplicate:		N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit					
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.073 U	0.067 U	0.069 U	0.073 U	0.089 U

Table 5. Summary of Polychlorinated Biphenyls in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-17	RXSB-17	RXTGW-12	RXTGW-12
			Sample Date:		05/23/2018	05/23/2018	05/24/2018	05/24/2018
			Sample Depth (ft bls):		0 - 2	5 - 7	0 - 2	4 - 6
			Normal or Field Duplicate:		FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
PCB-1016 (Aroclor 1016)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1221 (Aroclor 1221)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1232 (Aroclor 1232)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1242 (Aroclor 1242)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1248 (Aroclor 1248)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1254 (Aroclor 1254)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1260 (Aroclor 1260)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1262 (Aroclor 1262)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
PCB-1268 (Aroclor 1268)	--	--	--	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U
Polychlorinated Biphenyl (PCBs)	0.1	1	3.2	MG/KG	0.091 U	0.075 U	0.077 U	0.074 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-1	RXMW-1	RXMW-10	RXMW-10
			Sample Date:		06/14/2018	06/15/2018	04/23/2018	04/23/2018
			Sample Depth (ft bls):		0 - 2	7 - 9	0 - 2	2 - 4
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.039 U	0.036 U	0.038 U	0.038 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.039 U	0.036 U	0.038 U	0.038 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0023 U	0.0021 U	0.0023 U	0.0023 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0023 U	0.0021 U	0.0023 U	0.0023 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Chlordane	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.076 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0023 U	0.0021 U	0.0023 U	0.0023 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0023 UJV	0.0021 U	0.0023 U	0.0023 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Endrin	0.014	11	0.06	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Endrin Aldehyde	--	--	--	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Endrin Ketone	--	--	--	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0023 U	0.0021 U	0.0023 U	0.0023 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Methoxychlor	--	--	--	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0025 J	0.0072 U	0.0076 U	0.0076 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0078 U	0.0072 U	0.0076 U	0.0076 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.31 UJV	0.29 U	0.3 U	0.3 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.039 UJV	0.036 U	0.038 U	0.038 U
Toxaphene	--	--	--	MG/KG	0.078 U	0.072 U	0.076 U	0.076 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

				Sample Designation:	RXMW-11	RXMW-11	RXMW-2	RXMW-2
				Sample Date:	04/23/2018	04/27/2018	06/15/2018	06/15/2018
				Sample Depth (ft bls):	0 - 2	11 - 13	0 - 2	13 - 15
				Normal or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.035 U	0.036 U	0.037 U	0.036 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.035 U	0.036 U	0.037 U	0.036 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.0022 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.0022 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Chlordane	--	--	--	MG/KG	0.071 U	0.072 U	0.074 U	0.073 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.0022 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.0022 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Endrin	0.014	11	0.06	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Endrin Aldehyde	--	--	--	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Endrin Ketone	--	--	--	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.0022 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Methoxychlor	--	--	--	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0071 U	0.0072 U	0.0074 U	0.0073 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.28 U	0.29 U	0.29 U	0.29 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.035 U	0.036 U	0.037 U	0.036 U
Toxaphene	--	--	--	MG/KG	0.071 U	0.072 U	0.074 U	0.073 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-3	RXMW-4	RXMW-4	RXMW-5
			Sample Date:		05/25/2018	04/24/2018	05/01/2018	04/26/2018
			Sample Depth (ft bls):		1 - 3	0 - 2	13 - 15	0 - 2
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.039 U	0.036 U	0.036 U	0.037 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.039 U	0.036 U	0.036 U	0.037 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0024 U	0.0022 U	0.0022 U	0.0022 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0024 U	0.0022 U	0.0022 U	0.0022 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Chlordane	--	--	--	MG/KG	0.079 U	0.073 U	0.073 U	0.075 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0024 U	0.0022 U	0.0022 U	0.0022 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0024 U	0.0022 U	0.0022 U	0.0022 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Endrin	0.014	11	0.06	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Endrin Aldehyde	--	--	--	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Endrin Ketone	--	--	--	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0024 U	0.0022 U	0.0022 U	0.0022 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Methoxychlor	--	--	--	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0079 U	0.0073 U	0.0073 U	0.0075 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.31 U	0.29 U	0.29 U	0.3 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.039 U	0.036 U	0.036 U	0.037 U
Toxaphene	--	--	--	MG/KG	0.079 U	0.073 U	0.073 U	0.075 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-5	RXMW-6	RXMW-6	RXMW-7
			Sample Date:		05/02/2018	04/25/2018	04/27/2018	06/14/2018
			Sample Depth (ft bls):		12 - 14	0 - 2	9 - 11	0 - 2
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.036 U	0.036 U	0.037 U	0.037 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.036 U	0.036 U	0.037 U	0.037 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Chlordane	--	--	--	MG/KG	0.073 U	0.072 U	0.074 U	0.075 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Endrin	0.014	11	0.06	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Endrin Aldehyde	--	--	--	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Endrin Ketone	--	--	--	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0022 U	0.0022 U	0.0022 U	0.0022 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Methoxychlor	--	--	--	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0073 U	0.0072 U	0.0074 U	0.0075 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.29 U	0.29 U	0.29 U	0.3 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.036 U	0.036 U	0.037 U	0.037 UJV
Toxaphene	--	--	--	MG/KG	0.073 U	0.072 U	0.074 U	0.075 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-7	RXMW-7	RXMW-8	RXMW-8
			Sample Date:		06/15/2018	06/15/2018	05/29/2018	05/29/2018
			Sample Depth (ft bls):		12 - 14	12 - 14	1 - 3	9 - 11
			Normal or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.039 U	0.039 U	0.036 U	0.037 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.039 U	0.039 U	0.036 U	0.037 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0023 U	0.0023 U	0.0022 U	0.0022 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0023 U	0.0023 U	0.0022 U	0.0022 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Chlordane	--	--	--	MG/KG	0.078 U	0.078 U	0.073 U	0.074 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0023 U	0.0023 U	0.0022 U	0.0022 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0023 U	0.0023 U	0.0022 U	0.0022 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Endrin	0.014	11	0.06	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Endrin Aldehyde	--	--	--	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Endrin Ketone	--	--	--	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0023 U	0.0023 U	0.0022 U	0.0022 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Methoxychlor	--	--	--	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0078 U	0.0078 U	0.0073 U	0.0074 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.31 U	0.31 U	0.29 U	0.29 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.039 U	0.039 U	0.036 U	0.037 U
Toxaphene	--	--	--	MG/KG	0.078 U	0.078 U	0.073 U	0.074 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXMW-9	RXMW-9	RXSB-11	RXSB-11
			Sample Date:		04/23/2018	04/25/2018	04/23/2018	04/26/2018
			Sample Depth (ft bls):		0 - 2	5 - 7	0 - 2	3 - 5
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0022 U	0.0022 U	0.0021 U	0.0022 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0022 U	0.0022 U	0.0021 U	0.0022 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Chlordane	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0022 U	0.0022 U	0.0021 U	0.0022 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0022 U	0.0022 U	0.0021 U	0.0022 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Endrin	0.014	11	0.06	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Endrin Aldehyde	--	--	--	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Endrin Ketone	--	--	--	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0022 U	0.0022 U	0.0021 U	0.0022 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Methoxychlor	--	--	--	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0075 U	0.0073 U	0.0071 U	0.0072 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.3 U	0.29 U	0.28 U	0.29 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.037 U	0.036 U	0.035 U	0.036 U
Toxaphene	--	--	--	MG/KG	0.075 U	0.073 U	0.071 U	0.072 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-12	RXSB-12	RXSB-13	RXSB-13
			Sample Date:		04/23/2018	04/26/2018	04/24/2018	04/26/2018
			Sample Depth (ft bls):		0 - 2	6 - 8	0 - 2	13 - 15
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.036 U	0.038 U	0.04 U	0.037 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.036 U	0.038 U	0.04 U	0.037 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0022 U	0.0023 U	0.0024 U	0.0022 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0022 U	0.0023 U	0.0024 U	0.0022 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Chlordane	--	--	--	MG/KG	0.073 U	0.077 U	0.08 U	0.074 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0022 U	0.0023 U	0.0024 U	0.0022 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0022 U	0.0023 U	0.0024 U	0.0022 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Endrin	0.014	11	0.06	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Endrin Aldehyde	--	--	--	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Endrin Ketone	--	--	--	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0022 U	0.0023 U	0.0024 U	0.0022 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
Methoxychlor	--	--	--	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0073 U	0.0077 U	0.008 U	0.0074 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0073 U	0.0077 U	**0.0037 J**	0.0074 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.29 U	0.31 U	0.32 U	0.29 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.036 U	0.038 U	0.04 U	0.037 U
Toxaphene	--	--	--	MG/KG	0.073 U	0.077 U	0.08 U	0.074 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-14	RXSB-14	RXSB-15	RXSB-15
			Sample Date:		04/24/2018	04/24/2018	04/26/2018	05/01/2018
			Sample Depth (ft bls):		0 - 2	0 - 2	0 - 2	6 - 8
			Normal or Field Duplicate:		N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.036 U	0.036 U	0.036 U	0.033 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.036 U	0.036 U	0.036 U	0.033 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.002 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.002 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Chlordane	--	--	--	MG/KG	0.072 U	0.072 U	0.073 U	0.067 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.002 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.002 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Endrin	0.014	11	0.06	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Endrin Aldehyde	--	--	--	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Endrin Ketone	--	--	--	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0021 U	0.0021 U	0.0022 U	0.002 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Methoxychlor	--	--	--	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0072 U	0.0072 U	0.0073 U	0.0067 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.28 U	0.28 U	0.29 U	0.27 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.036 U	0.036 U	0.036 U	0.033 U
Toxaphene	--	--	--	MG/KG	0.072 U	0.072 U	0.073 U	0.067 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-16	RXSB-16	RXSB-17	RXSB-17
			Sample Date:		05/29/2018	05/29/2018	05/23/2018	05/23/2018
			Sample Depth (ft bls):		1 - 3	9 - 11	0 - 2	0 - 2
			Normal or Field Duplicate:		N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
Aldrin	0.005	0.097	0.19	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.002 U	0.0022 U	0.0026 U	0.0027 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.002 U	0.0022 U	0.0026 U	0.0027 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Chlordane	--	--	--	MG/KG	0.069 U	0.073 U	0.089 U	0.091 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.002 U	0.0022 U	0.0026 U	0.0027 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.002 U	0.0022 U	0.0026 U	0.0027 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Endrin	0.014	11	0.06	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Endrin Aldehyde	--	--	--	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Endrin Ketone	--	--	--	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.002 U	0.0022 U	0.0026 U	0.0027 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
Methoxychlor	--	--	--	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0069 U	0.0073 U	0.0089 U	0.0091 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	**0.0037 J**	0.0073 U	**0.0063 J**	**0.005 J**
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.27 U	0.29 U	0.35 U	0.36 U
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.034 U	0.036 U	0.044 U	0.045 U
Toxaphene	--	--	--	MG/KG	0.069 U	0.073 U	0.089 U	0.091 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXSB-17	RXTGW-12	RXTGW-12	RXTGW-12
			Sample Date:		05/23/2018	05/24/2018	05/24/2018	06/14/2018
			Sample Depth (ft bls):		5 - 7	0 - 2	4 - 6	0 - 2
			Normal or Field Duplicate:		N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	0.037 U	0.039 U	0.037 U	NA
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	0.037 U	0.039 U	0.037 U	NA
Aldrin	0.005	0.097	0.19	MG/KG	0.0075 U	NA	NA	0.0082 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0022 U	NA	NA	0.0025 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0075 U	NA	NA	0.0082 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0022 U	NA	NA	0.0025 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0075 U	NA	NA	0.0082 U
Chlordane	--	--	--	MG/KG	0.075 U	NA	NA	0.082 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0022 U	NA	NA	0.0025 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0022 U	NA	NA	0.0025 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0075 U	NA	NA	0.0082 U
Endrin	0.014	11	0.06	MG/KG	0.0075 U	NA	NA	0.0082 U
Endrin Aldehyde	--	--	--	MG/KG	0.0075 U	NA	NA	0.0082 U
Endrin Ketone	--	--	--	MG/KG	0.0075 U	NA	NA	0.0082 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0022 U	NA	NA	0.0025 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0075 U	NA	NA	0.0082 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0075 U	NA	NA	0.0082 U
Methoxychlor	--	--	--	MG/KG	0.0075 U	NA	NA	0.0082 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0075 U	NA	NA	0.0082 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0075 U	NA	NA	0.0082 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0075 U	NA	NA	0.0082 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	0.3 U	0.31 UJV	0.3 UJV	NA
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	0.037 U	0.039 U	0.037 U	NA
Toxaphene	--	--	--	MG/KG	0.075 U	NA	NA	0.082 U

Table 6. Summary of Pesticides and Herbicides in Soil, 1221 Spofford Avenue, Bronx, New York

			Sample Designation:		RXTGW-12
			Sample Date:		06/14/2018
			Sample Depth (ft bls):		4 - 6
			Normal or Field Duplicate:		N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO	Unit	
2,4-D (Dichlorophenoxyacetic Acid)	--	--	--	MG/KG	NA
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	--	MG/KG	NA
Aldrin	0.005	0.097	0.19	MG/KG	0.0074 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	0.02	MG/KG	0.0022 U
Alpha Endosulfan	2.4	24	102	MG/KG	0.0074 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	0.09	MG/KG	0.0022 U
Beta Endosulfan	2.4	24	102	MG/KG	0.0074 U
Chlordane	--	--	--	MG/KG	0.074 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	0.25	MG/KG	0.0022 U
Dieldrin	0.005	0.2	0.1	MG/KG	0.0022 U
Endosulfan Sulfate	2.4	24	1000	MG/KG	0.0074 U
Endrin	0.014	11	0.06	MG/KG	0.0074 U
Endrin Aldehyde	--	--	--	MG/KG	0.0074 U
Endrin Ketone	--	--	--	MG/KG	0.0074 U
Gamma Bhc (Lindane)	0.1	1.3	0.1	MG/KG	0.0022 U
Heptachlor	0.042	2.1	0.38	MG/KG	0.0074 U
Heptachlor Epoxide	--	--	--	MG/KG	0.0074 U
Methoxychlor	--	--	--	MG/KG	0.0074 U
P,P'-DDD	0.0033	13	14	MG/KG	0.0074 U
P,P'-DDE	0.0033	8.9	17	MG/KG	0.0074 U
P,P'-DDT	**0.0033**	7.9	136	MG/KG	0.0074 U
Pentachlorophenol	0.8	6.7	0.8	MG/KG	NA
Silvex (2,4,5-TP)	3.8	100	3.8	MG/KG	NA
Toxaphene	--	--	--	MG/KG	0.074 U

Table 7. Summary of Volatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		MW-01	MW-02	MW-6	RXMW-1	RXMW-10	RXMW-11
	Sample Date:		06/21/2018	06/21/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards	Unit						
1,1,1-Trichloroethane (TCA)	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-Chloropropane	0.04	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane (Ethylene Dibromide)	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	3	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.6	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	3	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	3	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dioxane (P-Dioxane)	--	UG/L	50 U	50 U	50 U	50 U	50 U	50 U
2-Hexanone	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	50	UG/L	5.9 UV	5.4 UV	5 U	7.9 UV	5 U	5 U
Benzene	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	50	UG/L	1 UJV	1 UJV	1 U	1 U	1 U	1 U
Bromomethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	UG/L	1 UJV	1 UJV	1 U	1 U	1 U	1 U
Chlorobenzene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	UG/L	1 UT	1 UT	1 U	1 U	1 U	1 U
Chloroform	**7**	UG/L	1 U	1 U	1 U	**7.3**	1 U	1 U
Chloromethane	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	UG/L	1 U	0.32 J	1 U	0.56 J	1 U	1 U
Cis-1,3-Dichloropropene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Cyclohexane	--	UG/L	1 U	0.71 J	1 U	1 U	1 U	1 U
Dibromochloromethane	50	UG/L	1 UJV	1 UJV	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U

Table 7. Summary of Volatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		MW-01	MW-02	MW-6	RXMW-1	RXMW-10	RXMW-11
	Sample Date:		06/21/2018	06/21/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards	Unit						
Ethylbenzene	**5**	UG/L	**10**	**6.8**	1 U	1 U	1 U	1 U
Isopropylbenzene (Cumene)	**5**	UG/L	3.3	**6.1**	0.38 J	1 U	1 U	1 U
m,p-Xylene	5	UG/L	2.3	3.4	1 U	1 U	1 U	1 U
Methyl Acetate	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Methyl Ethyl Ketone (2-Butanone)	50	UG/L	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
Methylcyclohexane	--	UG/L	0.59 J	1.6	1 U	1 U	1 U	1 U
Methylene Chloride	5	UG/L	1 U	1 U	1 U	1.4	1 U	1 U
O-Xylene (1,2-Dimethylbenzene)	5	UG/L	0.56 J	0.58 J	1 U	1 U	1 U	1 U
Styrene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Tert-Butyl Methyl Ether	**10**	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	5	UG/L	1 U	0.61 J	1 U	1 U	1 U	1 U
Trichlorofluoromethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	2	UG/L	1 U	1 U	1 U	1 U	1 U	1 U

Table 7. Summary of Volatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

Parameter	NYSDEC Ambient Water-Quality Standards	Unit	RXMW-2	RXMW-3	RXMW-4	RXMW-4	RXMW-5	RXMW-6
Sample Designation:			RXMW-2	RXMW-3	RXMW-4	RXMW-4	RXMW-5	RXMW-6
Sample Date:			06/22/2018	06/22/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018
Normal or Field Duplicate:			N	N	N	FD	N	N
1,1,1-Trichloroethane (TCA)	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-Chloropropane	0.04	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane (Ethylene Dibromide)	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	3	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.6	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	3	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	3	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dioxane (P-Dioxane)	--	UG/L	50 U	50 U	50 U	50 U	50 U	50 U
2-Hexanone	50	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	50	UG/L	10 UV	5 U	5 U	5 U	14 UV	5 U
Benzene	1	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	50	UG/L	1 U	1 U	1 UJV	1 UJV	1 UJV	1 UJV
Bromomethane	5	UG/L	1 UJV	1 UJV	1 U	1 U	1 U	1 U
Carbon Disulfide	60	UG/L	1 U	0.2 J	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	UG/L	1 U	1 U	1 UJV	1 UJV	1 UJV	1 UJV
Chlorobenzene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	UG/L	1 U	1 U	1 UT	1 UT	1 UT	1 UT
Chloroform	**7**	UG/L	6.4	1 U	1 U	1 U	1 U	1 U
Chloromethane	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Cyclohexane	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	UG/L	1 U	1 U	1 UJV	1 UJV	1 UJV	1 UJV
Dichlorodifluoromethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U

Table 7. Summary of Volatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		RXMW-2	RXMW-3	RXMW-4	RXMW-4	RXMW-5	RXMW-6
	Sample Date:		06/22/2018	06/22/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018
	Normal or Field Duplicate:		N	N	N	FD	N	N
Parameter	NYSDEC Ambient Water-Quality Standards	Unit						
Ethylbenzene	**5**	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene (Cumene)	**5**	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Acetate	--	UG/L	5 U	5 U	5 U	5 U	5 U	5 U
Methyl Ethyl Ketone (2-Butanone)	50	UG/L	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
Methylcyclohexane	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
O-Xylene (1,2-Dimethylbenzene)	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Tert-Butyl Methyl Ether	**10**	UG/L	1 U	1 U	1 U	1 U	1 U	**67**
Tetrachloroethylene (PCE)	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	--	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	5	UG/L	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	2	UG/L	1 U	1 U	1 U	1 U	1 U	1 U

Table 7. Summary of Volatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

Parameter	NYSDEC Ambient Water-Quality Standards	Unit	RXMW-7	RXMW-8	RXMW-9
Sample Designation:			RXMW-7	RXMW-8	RXMW-9
Sample Date:			06/21/2018	06/22/2018	06/22/2018
Normal or Field Duplicate:			N	N	N
1,1,1-Trichloroethane (TCA)	5	UG/L	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	UG/L	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	UG/L	1 U	1 U	1 U
1,1,2-Trichloroethane	1	UG/L	1 U	1 U	1 U
1,1-Dichloroethane	5	UG/L	1 U	1 U	1 U
1,1-Dichloroethene	5	UG/L	1 U	1 U	1 U
1,2,3-Trichlorobenzene	5	UG/L	1 U	1 U	1 U
1,2,4-Trichlorobenzene	5	UG/L	1 U	1 U	1 U
1,2-Dibromo-3-Chloropropane	0.04	UG/L	1 U	1 U	1 U
1,2-Dibromoethane (Ethylene Dibromide)	--	UG/L	1 U	1 U	1 U
1,2-Dichlorobenzene	3	UG/L	1 U	1 U	1 U
1,2-Dichloroethane	0.6	UG/L	1 U	1 U	1 U
1,2-Dichloropropane	1	UG/L	1 U	1 U	1 U
1,3-Dichlorobenzene	3	UG/L	1 U	1 U	1 U
1,4-Dichlorobenzene	3	UG/L	1 U	1 U	1 U
1,4-Dioxane (P-Dioxane)	--	UG/L	50 U	50 U	50 U
2-Hexanone	50	UG/L	5 U	5 U	5 U
Acetone	50	UG/L	5 U	5 U	5 U
Benzene	1	UG/L	1 U	1 U	1 U
Bromochloromethane	5	UG/L	1 U	1 U	1 U
Bromodichloromethane	50	UG/L	1 U	1 U	1 U
Bromoform	50	UG/L	1 UJV	1 U	1 U
Bromomethane	5	UG/L	1 U	1 UJV	1 UJV
Carbon Disulfide	60	UG/L	1 U	1 U	1 U
Carbon Tetrachloride	5	UG/L	1 UJV	1 U	1 U
Chlorobenzene	5	UG/L	1 U	1 U	1 U
Chloroethane	5	UG/L	1 UT	1 U	1 U
Chloroform	**7**	UG/L	3	1 U	1 U
Chloromethane	--	UG/L	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	UG/L	1 U	1 U	1 U
Cis-1,3-Dichloropropene	5	UG/L	1 U	1 U	1 U
Cyclohexane	--	UG/L	1 U	1 U	1 U
Dibromochloromethane	50	UG/L	1 UJV	1 U	1 U
Dichlorodifluoromethane	5	UG/L	1 U	1 U	1 U

Table 7. Summary of Volatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		RXMW-7	RXMW-8	RXMW-9
	Sample Date:		06/21/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards	Unit			
Ethylbenzene	**5**	UG/L	1 U	1 U	1 U
Isopropylbenzene (Cumene)	**5**	UG/L	1 U	1 U	1 U
m,p-Xylene	5	UG/L	1 U	1 U	1 U
Methyl Acetate	--	UG/L	5 U	5 U	5 U
Methyl Ethyl Ketone (2-Butanone)	50	UG/L	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	UG/L	5 U	5 U	5 U
Methylcyclohexane	--	UG/L	1 U	1 U	1 U
Methylene Chloride	5	UG/L	1 U	1 U	1 U
O-Xylene (1,2-Dimethylbenzene)	5	UG/L	1 U	1 U	1 U
Styrene	5	UG/L	1 U	1 U	1 U
Tert-Butyl Methyl Ether	**10**	UG/L	1	1 U	1 U
Tetrachloroethylene (PCE)	5	UG/L	0.25 J	1 U	1 U
Toluene	5	UG/L	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	UG/L	1 U	1 U	1 U
Trans-1,3-Dichloropropene	--	UG/L	1 U	1 U	1 U
Trichloroethylene (TCE)	5	UG/L	1 U	1 U	1 U
Trichlorofluoromethane	5	UG/L	1 U	1 U	1 U
Vinyl Chloride	2	UG/L	1 U	1 U	1 U

Table 8. Summary of Semivolatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		MW-01	MW-02	MW-6	RXMW-1	RXMW-10	RXMW-11	RXMW-2
	Sample Date:		06/21/2018	06/21/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit							
1,2,4,5-Tetrachlorobenzene	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
1,4-Dioxane (P-Dioxane)	--	UG/L	NA	NA	NA	NA	NA	NA	0.23 U
2,3,4,6-Tetrachlorophenol	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2,4,5-Trichlorophenol	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2,4,6-Trichlorophenol	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2,4-Dichlorophenol	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2,4-Dimethylphenol	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2,4-Dinitrophenol	10	UG/L	20 U	20 U	20 U	26 U	20 U	20 U	26 U
2,4-Dinitrotoluene	5	UG/L	2 U	2 U	2 U	2.6 U	2 U	2 U	2.6 U
2,6-Dinitrotoluene	5	UG/L	2 U	2 U	2 U	2.6 U	2 U	2 U	2.6 U
2-Chloronaphthalene	10	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2-Chlorophenol	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2-Methylnaphthalene	--	UG/L	10 U	3.9 J	10 U	13 U	10 U	10 U	13 U
2-Methylphenol (O-Cresol)	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2-Nitroaniline	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
2-Nitrophenol	--	UG/L	10 UT	10 UT	10 U	13 U	10 U	10 U	13 U
3,3'-Dichlorobenzidine	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
3-Nitroaniline	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
4,6-Dinitro-2-Methylphenol	--	UG/L	20 U	20 U	20 U	26 U	20 U	20 U	26 U
4-Bromophenyl Phenyl Ether	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
4-Chloro-3-Methylphenol	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
4-Chloroaniline	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
4-Chlorophenyl Phenyl Ether	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
4-Methylphenol (P-Cresol)	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
4-Nitroaniline	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
4-Nitrophenol	--	UG/L	20 U	20 U	20 U	26 U	20 U	20 U	26 U
Acenaphthene	20	UG/L	3.1 J	5.2 J	10 U	13 U	10 U	10 U	13 U
Acenaphthylene	20	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Acetophenone	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Anthracene	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Atrazine	--	UG/L	2 U	2 U	2 UJV	2.6 UJV	2 UJV	2 UJV	2.6 UJV
Benzaldehyde	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Benzo(A)Anthracene	0.002	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
Benzo(A)Pyrene	0	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U

Table 8. Summary of Semivolatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		MW-01	MW-02	MW-6	RXMW-1	RXMW-10	RXMW-11	RXMW-2
	Sample Date:		06/21/2018	06/21/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit							
Benzo(B)Fluoranthene	0.002	UG/L	2 U	2 U	2 U	2.6 U	2 U	2 U	2.6 U
Benzo(G,H,I)Perylene	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Benzo(K)Fluoranthene	0.002	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
Benzyl Butyl Phthalate	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Biphenyl (Diphenyl)	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Bis(2-Chloroethoxy) Methane	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
Bis(2-Chloroisopropyl) Ether	5	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Bis(2-Ethylhexyl) Phthalate	5	UG/L	2 U	2 U	2 U	2.6 U	2 U	2 U	2.6 U
Caprolactam	--	UG/L	10 U	10 U	10 RV	13 RV	10 RV	10 RV	13 RV
Carbazole	--	UG/L	2.2 J	1.2 J	10 U	13 U	10 U	10 U	13 U
Chrysene	0.002	UG/L	2 U	2 U	2 U	2.6 U	2 U	2 U	2.6 U
Dibenz(A,H)Anthracene	--	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
Dibenzofuran	--	UG/L	10 U	10 UV	10 U	13 U	10 U	10 U	13 U
Diethyl Phthalate	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Dimethyl Phthalate	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Di-N-Butyl Phthalate	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Di-N-Octylphthalate	--	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Fluoranthene	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Fluorene	50	UG/L	2.8 J	3.7 J	10 U	13 U	10 U	10 U	13 U
Hexachlorobenzene	0.04	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
Hexachlorobutadiene	0.5	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
Hexachlorocyclopentadiene	5	UG/L	10 UT	10 UT	10 U	13 U	10 U	10 U	13 U
Hexachloroethane	5	UG/L	2 U	2 U	2 U	2.6 U	2 U	2 U	2.6 U
Indeno(1,2,3-C,D)Pyrene	0.002	UG/L	2 U	2 U	2 U	2.6 U	2 U	2 U	2.6 U
Isophorone	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Naphthalene	10	UG/L	7.5 J	6.8 J	10 U	13 U	10 U	10 U	13 U
Nitrobenzene	0.4	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
N-Nitrosodi-N-Propylamine	--	UG/L	1 U	1 U	1 U	1.3 U	1 U	1 U	1.3 U
N-Nitrosodiphenylamine	50	UG/L	10 U	10 UV	10 U	13 U	10 U	10 U	13 U
Pentachlorophenol	1	UG/L	20 U	20 U	20 U	26 U	20 U	20 U	26 U
Phenanthrene	50	UG/L	3 J	3.3 J	10 U	13 U	10 U	10 U	13 U
Phenol	1	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U
Pyrene	50	UG/L	10 U	10 U	10 U	13 U	10 U	10 U	13 U

Table 8. Summary of Semivolatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit	RXMW-3	RXMW-4	RXMW-4	RXMW-5	RXMW-6	RXMW-7	RXMW-8	RXMW-9
Sample Date:			06/22/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/22/2018	06/22/2018
Normal or Field Duplicate:			N	N	FD	N	N	N	N	N
1,2,4,5-Tetrachlorobenzene	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
1,4-Dioxane (P-Dioxane)	--	UG/L	NA	0.17 UT	NA	NA	NA	0.33 T	NA	NA
2,3,4,6-Tetrachlorophenol	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2,4-Dichlorophenol	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2,4-Dimethylphenol	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2,4-Dinitrophenol	10	UG/L	26 U	20 U	20 U	20 U	22 U	20 U	20 U	20 U
2,4-Dinitrotoluene	5	UG/L	2.6 U	2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5	UG/L	2.6 U	2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
2-Chloronaphthalene	10	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2-Chlorophenol	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2-Methylnaphthalene	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2-Methylphenol (O-Cresol)	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2-Nitroaniline	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
2-Nitrophenol	--	UG/L	13 U	10 UT	10 UT	10 UT	11 UT	10 UT	10 U	10 U
3,3'-Dichlorobenzidine	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
3-Nitroaniline	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
4,6-Dinitro-2-Methylphenol	--	UG/L	26 U	20 U	20 U	20 U	22 U	20 U	20 U	20 U
4-Bromophenyl Phenyl Ether	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
4-Chloro-3-Methylphenol	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
4-Chloroaniline	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
4-Chlorophenyl Phenyl Ether	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
4-Methylphenol (P-Cresol)	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
4-Nitroaniline	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
4-Nitrophenol	--	UG/L	26 U	20 U	20 U	20 U	22 U	20 U	20 U	20 U
Acenaphthene	20	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Acenaphthylene	20	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Acetophenone	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Anthracene	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Atrazine	--	UG/L	2.6 UJV	2 U	2 U	2 U	2.2 U	2 U	2 UJV	2 UJV
Benzaldehyde	--	UG/L	13 U	10 RV	10 U	10 U	11 U	10 U	10 U	10 U
Benzo(A)Anthracene	0.002	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Benzo(A)Pyrene	0	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U

Table 8. Summary of Semivolatile Organic Compounds in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		RXMW-3	RXMW-4	RXMW-4	RXMW-5	RXMW-6	RXMW-7	RXMW-8	RXMW-9
	Sample Date:		06/22/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	FD	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit								
Benzo(B)Fluoranthene	0.002	UG/L	2.6 U	2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
Benzo(G,H,I)Perylene	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Benzo(K)Fluoranthene	0.002	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Benzyl Butyl Phthalate	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Biphenyl (Diphenyl)	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	5	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	5	UG/L	2.6 U	1.8 J	2 U	2 U	2 J	1.7 J	2 U	2 U
Caprolactam	--	UG/L	13 RV	10 U	10 U	10 U	11 U	10 U	10 RV	10 RV
Carbazole	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Chrysene	0.002	UG/L	2.6 U	2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
Dibenz(A,H)Anthracene	--	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Dibenzofuran	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Diethyl Phthalate	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Dimethyl Phthalate	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Di-N-Butyl Phthalate	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Di-N-Octylphthalate	--	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Fluoranthene	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Fluorene	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Hexachlorobenzene	0.04	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Hexachlorocyclopentadiene	5	UG/L	13 U	10 UT	10 UT	10 UT	11 UT	10 UT	10 U	10 U
Hexachloroethane	5	UG/L	2.6 U	2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
Indeno(1,2,3-C,D)Pyrene	0.002	UG/L	2.6 U	2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
Isophorone	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Naphthalene	10	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Nitrobenzene	0.4	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
N-Nitrosodi-N-Propylamine	--	UG/L	1.3 U	1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
N-Nitrosodiphenylamine	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Pentachlorophenol	1	UG/L	26 U	20 U	20 U	20 U	22 U	20 U	20 U	20 U
Phenanthrene	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Phenol	1	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U
Pyrene	50	UG/L	13 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U

Table 9. Summary of Metals in Groundwater, 1221 Spofford Avenue, Bronx, New York

Sample Designation:			MW-01	MW-01	MW-02	MW-02	MW-6	MW-6	RXMW-1	RXMW-1	RXMW-10
Sample Date:			06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018
Normal or Field Duplicate:			N	N	N	N	N	N	N	N	N
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit									
Aluminum	--	UG/L	228	92.2	44.5	40 U	62.1	84.4	10500	241	219
Antimony	**3**	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.72 J
Arsenic	25	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2.7	2 U	6.1
Barium	1000	UG/L	111	104	119	100	113	105	193	110	81.4
Beryllium	3	UG/L	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	1.2	0.8 U	0.8 U
Cadmium	5	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Calcium	--	UG/L	107000	103000	61800	52500	164000	169000	68800	92600	54500
Chromium, Hexavalent	50	UG/L	10 U	NA	10 RV	NA	10 U	NA	10 U	NA	10 U
Chromium, Total	50	UG/L	4 U	4 U	4 U	4 U	4 U	4 U	23.1	4 U	4 U
Cobalt	--	UG/L	4 U	4 U	4 U	4 U	4 U	4 U	9.7	4 U	1.7 J
Copper	200	UG/L	2.6 J	4 U	4 U	4 U	4 U	4 U	29.8	4 U	4 U
Cyanide	200	UG/L	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U
Iron	**300**	UG/L	**2820**	**1770**	**2330 B**	**353**	**4270**	**1310**	**14800**	191	**1560**
Lead	**25**	UG/L	0.72 J	0.47 J	1.2 U	1.2 U	1.2 U	1.2 U	**26**	2.2	0.42 J
Magnesium	**35000**	UG/L	21200	18800	24400	20000	**59800**	**56600**	24700	27400	19500
Manganese	**300**	UG/L	**526**	**486**	**533**	**428**	**495**	**464**	269	117	**651**
Mercury	0.7	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
Nickel	100	UG/L	4 U	4 U	4 U	4 U	4 U	1.5 J	26	1.5 J	4.1
Potassium	--	UG/L	6280	5720	4780	4090	7420	7260	9560	6840	5670
Selenium	10	UG/L	10 U	10 U	10 UJV	10 U	10 U	10 U	10 U	10 U	10 U
Silver	50	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium	**20000**	UG/L	9740	9010	**22900**	17100	**251000**	**151000**	**21100**	**23200**	**25600**
Thallium	0.5	UG/L	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.25 J	0.8 U	0.8 U
Vanadium	--	UG/L	4 U	4 U	4 U	4 U	4 U	4 U	31.8	4 U	4 U
Zinc	2000	UG/L	8.2 J	16 U	16 U	16 U	16 U	16 U	60.8	16 U	16 U

Table 9. Summary of Metals in Groundwater, 1221 Spofford Avenue, Bronx, New York

Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit	Sample Designation: RXMW-10	RXMW-11	RXMW-11	RXMW-2	RXMW-2	RXMW-3	RXMW-3	RXMW-4	RXMW-4
			Sample Date: 06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/21/2018	06/21/2018
			Normal or Field Duplicate: N	N	N	N	N	N	N	N	N
			Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Aluminum	--	UG/L	17.5 J	71.8	40 U	509	27.3 J	233	30.4 J	3220	40 U
Antimony	**3**	UG/L	2 U	2 U	2 U	2 U	2 U	0.8 J	2 U	**3.2**	2 U
Arsenic	25	UG/L	3.5	2	1.4 J	2 U	2 U	1.2 J	0.96 J	2 U	2 U
Barium	1000	UG/L	90.1	60.5	55	66.7	60.8	114	109	98.4	63.3
Beryllium	3	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
Cadmium	5	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Calcium	--	UG/L	57900	75500	76100	79500	80100	125000	126000	87000	82700
Chromium, Hexavalent	50	UG/L	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Chromium, Total	50	UG/L	4 U	4 U	4 U	1.3 J	4 U	4 U	4 U	5.8	4 U
Cobalt	--	UG/L	3 J	4 U	4 U	4.6	3.7 J	4 U	4 U	4.8	2.2 J
Copper	200	UG/L	4 U	4 U	4 U	2.4 J	4 U	4 U	4 U	11.1	4 U
Cyanide	200	UG/L	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Iron	**300**	UG/L	**850**	**2250**	**1060**	**973**	120 U	**2520**	**960**	**5190**	120 U
Lead	**25**	UG/L	1.2 U	1.2 U	1.2 U	0.47 J	1.2 U	1.2 U	1.2 U	5.7	1.2 U
Magnesium	**35000**	UG/L	19400	30800	29100	26900	25300	**37300**	**35900**	**37800**	34100
Manganese	**300**	UG/L	**632**	**681**	**616**	**606**	**525**	**506**	**480**	**655**	**548**
Mercury	0.7	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
Nickel	100	UG/L	12.7	4 U	1.8 J	5.2	3.6 J	1.7 J	1.3 J	8.2	3.6 J
Potassium	--	UG/L	4950	8190	7510	5770	5230	7650	7360	7990	5620
Selenium	10	UG/L	0.79 J	10 U	10 U	10 U	10 U	10 U	10 U	1.3 J	1.5 J
Silver	50	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium	**20000**	UG/L	**22000**	**34700**	**32400**	**70900**	**68500**	**27300**	**26100**	**132000**	**128000**
Thallium	0.5	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
Vanadium	--	UG/L	4 U	4 U	4 U	2 J	4 U	4 U	4 U	7.2	4 U
Zinc	2000	UG/L	16 U	16 U	16 U	6.6 J	16 U	16 U	16 U	25	16 U

Table 9. Summary of Metals in Groundwater, 1221 Spofford Avenue, Bronx, New York

Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit	Sample Designation: RXMW-4	RXMW-4	RXMW-5	RXMW-5	RXMW-6	RXMW-6	RXMW-7	RXMW-7	RXMW-8
			Sample Date: 06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/22/2018
			Normal or Field Duplicate: FD	FD	N	N	N	N	N	N	N
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Aluminum	--	UG/L	7230	23.7 J	53.6	40 U	30.8 J	21.2 J	401	40 U	41.1
Antimony	**3**	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Arsenic	25	UG/L	0.83 J	2 U	2 U	2 U	1.5 J	1.2 J	2 U	2 U	2 U
Barium	1000	UG/L	137	63.5	84.5	77.6	55	51.8	75.7	74.3	73.2
Beryllium	3	UG/L	0.44 J	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Cadmium	5	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Calcium	--	UG/L	75800	83500	149000	149000	85700	89100	69200	75100	101000
Chromium, Hexavalent	50	UG/L	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U
Chromium, Total	50	UG/L	13.3	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Cobalt	--	UG/L	8.6	2.1 J	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Copper	200	UG/L	27.1	4 U	4 U	4 U	4 U	4 U	4 U	4 U	5.7
Cyanide	200	UG/L	10 U	NA	2 J	NA	10 U	NA	10 U	NA	10 U
Iron	**300**	UG/L	**12100**	126	152	120 U	**1190**	120 U	**766**	120 U	70 J
Lead	**25**	UG/L	13.4	1.2 U	0.39 J	1.2 U	1.2 U	1.2 U	0.7 J	1.2 U	1.2 U
Magnesium	**35000**	UG/L	**37200**	34400	**61800**	**54800**	**46100**	**42500**	34900	33600	**49600**
Manganese	**300**	UG/L	**653**	**543**	167	114	**500**	**482**	240	213	38.5
Mercury	0.7	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
Nickel	100	UG/L	14.5	3.4 J	1.6 J	2.2 J	4 U	4 U	1.8 J	4 U	3.2 J
Potassium	--	UG/L	9210	5670	7350	6690	6030	5750	5590	5260	7180
Selenium	10	UG/L	1.4 J	1.1 J	1.4 J	1.4 J	10 U	10 U	10 U	10 U	10 U
Silver	50	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium	**20000**	UG/L	**123000**	**129000**	**245000**	**206000**	**48800**	**50500**	**44800**	**42200**	**40200**
Thallium	0.5	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
Vanadium	--	UG/L	15.4	4 U	4 U	4 U	4 U	4 U	2.4 J	1.3 J	4 U
Zinc	2000	UG/L	52.4	10.2 J	16 U	16 U	16 U	16 U	16 U	16 U	18.1

Table 9. Summary of Metals in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		RXMW-8	RXMW-9	RXMW-9
	Sample Date:		06/22/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N
			Dissolved	Total	Dissolved
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit			
Aluminum	--	UG/L	22.1 J	7090	47.7
Antimony	**3**	UG/L	2 U	2	1.7 J
Arsenic	25	UG/L	2 U	1.5 J	2 U
Barium	1000	UG/L	70.6	114	61.9
Beryllium	3	UG/L	0.8 U	0.8 UV	0.8 U
Cadmium	5	UG/L	2 U	2 U	2 U
Calcium	--	UG/L	101000	65000	74100
Chromium, Hexavalent	50	UG/L	NA	10 U	NA
Chromium, Total	50	UG/L	4 U	21	4 U
Cobalt	--	UG/L	4 U	57.5	8.1
Copper	200	UG/L	4 U	31.4	4 U
Cyanide	200	UG/L	NA	2.2 J	NA
Iron	**300**	UG/L	120 U	**14600**	120 U
Lead	**25**	UG/L	1.2 U	12.9	1.2 U
Magnesium	**35000**	UG/L	**47100**	25000	25600
Manganese	**300**	UG/L	25	132	3.5 J
Mercury	0.7	UG/L	0.2 U	0.2 U	0.2 U
Nickel	100	UG/L	2.3 J	14.1	4 U
Potassium	--	UG/L	6540	6190	3930
Selenium	10	UG/L	10 U	1.1 J	1.2 J
Silver	50	UG/L	2 U	2 U	2 U
Sodium	**20000**	UG/L	**37700**	10800	11900
Thallium	0.5	UG/L	0.8 U	0.8 U	0.8 U
Vanadium	--	UG/L	4 U	19.3	4 U
Zinc	2000	UG/L	15.1 J	85.6	16 U

Table 10. Summary of Polychlorinated Biphenyls in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		MW-01	MW-02	MW-6	RXMW-1	RXMW-10	RXMW-11	RXMW-2	RXMW-3
	Sample Date:		06/21/2018	06/21/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit								
PCB-1016 (Aroclor 1016)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1221 (Aroclor 1221)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1232 (Aroclor 1232)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1242 (Aroclor 1242)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1248 (Aroclor 1248)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1254 (Aroclor 1254)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1260 (Aroclor 1260)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1262 (Aroclor 1262)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1268 (Aroclor 1268)	--	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Polychlorinated Biphenyl (PCBs)	0.09	UG/L	0.41 U	0.41 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Table 10. Summary of Polychlorinated Biphenyls in Groundwater, 1221 Spofford Avenue, Bronx, New York

		Sample Designation:	RXMW-4	RXMW-4	RXMW-5	RXMW-6	RXMW-7	RXMW-8	RXMW-9
		Sample Date:	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/22/2018	06/22/2018
		Normal or Field Duplicate:	N	FD	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit							
PCB-1016 (Aroclor 1016)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1221 (Aroclor 1221)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1232 (Aroclor 1232)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1242 (Aroclor 1242)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1248 (Aroclor 1248)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1254 (Aroclor 1254)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1260 (Aroclor 1260)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1262 (Aroclor 1262)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
PCB-1268 (Aroclor 1268)	--	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U
Polychlorinated Biphenyl (PCBs)	0.09	UG/L	0.42 U	0.4 U	0.42 U	0.42 U	0.4 U	0.4 U	0.4 U

Table 11. Summary of Pesticides and Herbicides in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		MW-01	MW-02	MW-6	RXMW-1	RXMW-10	RXMW-11	RXMW-2
	Sample Date:		06/21/2018	06/21/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018	06/22/2018
	Normal or Field Duplicate:		N	N	N	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit							
2,4-D (Dichlorophenoxyacetic Acid)	50	UG/L	1.2 U	1.2 UJV	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	UG/L	1.2 U	1.2 UJV	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Aldrin	0	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Alpha Endosulfan	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Beta Bhc (Beta Hexachlorocyclohexane)	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Beta Endosulfan	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Chlordane	0.05	UG/L	0.51 U	0.51 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Delta BHC (Delta Hexachlorocyclohexane)	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Dieldrin	0.004	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endosulfan Sulfate	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin	0	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin Aldehyde	5	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin Ketone	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Gamma Bhc (Lindane)	--	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Heptachlor	0.04	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Heptachlor Epoxide	0.03	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Methoxychlor	35	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
P,P'-DDD	0.3	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
P,P'-DDE	0.2	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
P,P'-DDT	0.2	UG/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Pentachlorophenol	1	UG/L	20 U	20 U	20 U	26 U	20 U	20 U	26 U
Silvex (2,4,5-TP)	0.26	UG/L	1.2 U	1.2 UJV	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Toxaphene	0.06	UG/L	0.51 U	0.51 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 11. Summary of Pesticides and Herbicides in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		RXMW-3	RXMW-4	RXMW-4	RXMW-5	RXMW-6	RXMW-7	RXMW-8
	Sample Date:		06/22/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/21/2018	06/22/2018
	Normal or Field Duplicate:		N	N	FD	N	N	N	N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit							
2,4-D (Dichlorophenoxyacetic Acid)	50	UG/L	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	UG/L	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Aldrin	0	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Alpha Endosulfan	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Beta Bhc (Beta Hexachlorocyclohexane)	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Beta Endosulfan	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Chlordane	0.05	UG/L	0.5 U	0.52 U	0.5 U	0.52 U	0.52 U	0.5 U	0.5 U
Delta BHC (Delta Hexachlorocyclohexane)	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Dieldrin	0.004	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Endosulfan Sulfate	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Endrin	0	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Endrin Aldehyde	5	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Endrin Ketone	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Gamma Bhc (Lindane)	--	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Heptachlor	0.04	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Heptachlor Epoxide	0.03	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Methoxychlor	35	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
P,P'-DDD	0.3	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
P,P'-DDE	0.2	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
P,P'-DDT	0.2	UG/L	0.02 U	0.021 U	0.02 U	0.021 U	0.021 U	0.02 U	0.02 U
Pentachlorophenol	1	UG/L	26 U	20 U	20 U	20 U	22 U	20 U	20 U
Silvex (2,4,5-TP)	0.26	UG/L	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Toxaphene	0.06	UG/L	0.5 U	0.52 U	0.5 U	0.52 U	0.52 U	0.5 U	0.5 U

Table 11. Summary of Pesticides and Herbicides in Groundwater, 1221 Spofford Avenue, Bronx, New York

	Sample Designation:		RXMW-9
	Sample Date:		06/22/2018
	Normal or Field Duplicate:		N
Parameter	NYSDEC Ambient Water-Quality Standards and Guidance Values	Unit	
2,4-D (Dichlorophenoxyacetic Acid)	50	UG/L	1.2 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	UG/L	1.2 U
Aldrin	0	UG/L	0.02 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	--	UG/L	0.02 U
Alpha Endosulfan	--	UG/L	0.02 U
Beta Bhc (Beta Hexachlorocyclohexane)	--	UG/L	0.02 U
Beta Endosulfan	--	UG/L	0.02 U
Chlordane	0.05	UG/L	0.5 U
Delta BHC (Delta Hexachlorocyclohexane)	--	UG/L	0.02 U
Dieldrin	0.004	UG/L	0.02 U
Endosulfan Sulfate	--	UG/L	0.02 U
Endrin	0	UG/L	0.02 U
Endrin Aldehyde	5	UG/L	0.02 U
Endrin Ketone	--	UG/L	0.02 U
Gamma Bhc (Lindane)	--	UG/L	0.02 U
Heptachlor	0.04	UG/L	0.02 U
Heptachlor Epoxide	0.03	UG/L	0.02 U
Methoxychlor	35	UG/L	0.02 U
P,P'-DDD	0.3	UG/L	0.02 U
P,P'-DDE	0.2	UG/L	0.02 U
P,P'-DDT	0.2	UG/L	0.02 U
Pentachlorophenol	1	UG/L	20 U
Silvex (2,4,5-TP)	0.26	UG/L	1.2 U
Toxaphene	0.06	UG/L	0.5 U

Table 12. Summary of Perfluorinated Alkyl Acids in Groundwater, 1221 Spofford Avenue, Bronx, New York

Sample Designation:		RXMW-2	RXMW-4	RXMW-4	RXMW-7
Sample Date:		06/22/2018	06/21/2018	06/21/2018	06/21/2018
Normal or Field Duplicate:		N	N	FD	N
Parameter	Unit				
6:2-FTS	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
8:2-FTS	NG/L	**0.69 J**	1.74 U	1.67 U	2.55 U
EtFOSAA	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
MeFOSAA	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
PFBA	NG/L	**19.3 B**	**54.5 B**	**47 B**	**35.1 B**
PFBS	NG/L	**2.2**	**5.05**	**5.76**	**2.31**
PFDA	NG/L	**0.38 J**	1.74 U	**0.37 J**	**0.52 J**
PFDoA	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
PFDS	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
PFHpA	NG/L	**2.38 B**	**15.7 B**	**17.7 B**	**10.1 B**
PFHpS	NG/L	1.71 U	**5.01 B**	3.81 UV	1.1 UV
PFHxA	NG/L	**2.29 B**	**18 B**	**17.4 B**	**12.0 B**
PFHxS	NG/L	**3.03 B**	**15 B**	**15 B**	**7.38 B**
PFNA	NG/L	**1.44 J**	**1.96**	**1.32 J**	**3.01**
PFOA	NG/L	**12.3 B**	**64.9 B**	**65.6 B**	**19.9 B**
PFOS	NG/L	**10.9**	**28.2**	**28.2**	**28.3**
PFOSA	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
PFPeA	NG/L	**4.4**	**24.1**	**25.5**	**23.7**
PFTeDA	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
PFTrDA	NG/L	1.71 U	1.74 U	1.67 U	2.55 U
PFUnA	NG/L	**0.25 J**	1.74 U	1.67 U	**0.31 J**
PFOA & PFOS (total)	NG/L	**23.2 B**	**93.1 B**	**93.8 B**	**48.2 B**

Table 13. Summary of Volatile Organic Compounds in Soil Vapor, 1221 Spofford Avenue, Bronx, New York

Sample Designation:		RXSS-2	RXSS-3	RXSS-4	RXSS-5	RXSV-10	RXSV-11	RXSV-12	RXSV-13	RXSV-14	RXSV-4
Sample Date:		06/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	05/23/2018	06/22/2018	06/22/2018	06/22/2018	06/04/2018
Normal or Field Duplicate:		N	N	N	N	N	N	N	N	N	N
Parameter	Unit										
1,1,1-Trichloroethane (TCA)	UG/M3	11 UJV	11 U	120 U	11 UJV	11 U	11 U	3.3 U	2.2 U	58 U	11 UJV
1,1,2,2-Tetrachloroethane	UG/M3	14 UJV	14 U	150 U	14 UJV	14 U	14 U	4.1 U	2.7 U	73 U	14 UJV
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	15 UJV	15 U	170 U	15 UJV	15 U	15 U	**1.1 J**	**0.75 J**	81 U	15 UJV
1,1,2-Trichloroethane	UG/M3	11 UJV	11 U	120 U	11 UJV	11 U	11 U	3.3 U	2.2 U	58 U	11 UJV
1,1-Dichloroethane	UG/M3	8.1 UJV	8.1 U	89 U	8.1 UJV	8.1 U	8.1 U	2.4 U	1.6 U	43 U	8.1 UJV
1,1-Dichloroethene	UG/M3	1.4 UJV	1.4 U	15 U	1.4 UJV	1.4 U	1.4 U	0.42 U	0.28 U	7.4 U	1.4 UJV
1,2,4-Trichlorobenzene	UG/M3	37 UJV	37 UT	410 UT	37 UJV	37 UT	37 U	11 U	7.4 U	200 U	37 UJV
1,2,4-Trimethylbenzene	UG/M3	9.8 UJV	9.8 U	110 U	9.8 UJV	9.8 U	9.8 U	**3.3**	**0.9 J**	52 U	9.8 UJV
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	15 UJV	15 U	170 U	15 UJV	15 U	15 U	4.6 U	3.1 U	82 U	15 UJV
1,2-Dichlorobenzene	UG/M3	12 UJV	12 U	130 U	12 UJV	12 U	12 U	3.6 U	2.4 U	64 U	12 UJV
1,2-Dichloroethane	UG/M3	8.1 UJV	8.1 U	89 U	8.1 UJV	8.1 U	8.1 U	2.4 U	1.6 U	43 U	8.1 UJV
1,2-Dichloropropane	UG/M3	9.2 UJV	9.2 U	100 U	9.2 UJV	9.2 U	9.2 U	2.8 U	1.8 U	49 U	9.2 UJV
1,2-Dichlorotetrafluoroethane	UG/M3	14 UJV	14 U	150 U	14 UJV	14 U	14 U	4.2 U	2.8 U	74 U	14 UJV
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	9.8 UJV	9.8 U	110 U	9.8 UJV	9.8 U	9.8 U	**1.6 J**	2 U	52 U	9.8 UJV
1,3-Butadiene	UG/M3	4.4 UJV	4.4 U	49 U	4.4 UJV	4.4 U	4.4 U	1.3 U	0.88 U	**64**	4.4 UJV
1,3-Dichlorobenzene	UG/M3	12 UJV	12 U	130 U	12 UJV	12 U	12 U	3.6 U	2.4 U	64 U	12 UJV
1,4-Dichlorobenzene	UG/M3	12 UJV	12 U	130 U	12 UJV	12 U	12 U	**1.5 J**	2.4 U	64 U	12 UJV
1,4-Dioxane (P-Dioxane)	UG/M3	180 UJV	180 U	2000 U	180 UJV	180 U	180 U	54 U	36 U	960 U	180 UJV
2,2,4-Trimethylpentane	UG/M3	9.3 UJV	**5.1 J**	**3800**	9.3 UJV	**11**	9.3 U	**6.6**	1.9 U	50 U	9.3 UJV
2-Chlorotoluene	UG/M3	10 UJV	10 U	110 U	10 UJV	10 U	10 U	3.1 U	2.1 U	55 U	10 UJV
2-Hexanone	UG/M3	20 UJV	20 U	230 U	20 UJV	20 U	20 U	6.1 U	4.1 U	110 U	20 UJV
4-Ethyltoluene	UG/M3	9.8 UJV	9.8 U	110 U	9.8 UJV	9.8 U	9.8 U	**1.2 J**	2 U	52 U	9.8 UJV
Acetone	UG/M3	120 UJV	120 U	1300 U	**64 JV**	**220**	**410**	36 U	**23 J**	630 U	120 UJV
Allyl Chloride (3-Chloropropene)	UG/M3	16 UJV	16 U	170 U	16 UJV	16 U	16 U	4.7 U	3.1 U	83 U	16 UJV
Benzene	UG/M3	6.4 UJV	6.4 U	70 U	6.4 UJV	6.4 U	**5.5 J**	**1.5 J**	**1.5**	34 U	6.4 UJV
Benzyl Chloride	UG/M3	10 UJV	10 U	110 U	10 UJV	10 U	10 U	3.1 U	2.1 U	55 U	10 UJV
Bromodichloromethane	UG/M3	13 UJV	13 U	150 U	13 UJV	13 U	13 U	**3.3 J**	2.7 U	71 U	13 UJV
Bromoform	UG/M3	21 UJV	21 U	230 U	21 UJV	21 U	21 U	6.2 U	4.1 U	110 U	21 UJV
Bromomethane	UG/M3	7.8 UJV	7.8 U	85 U	7.8 UJV	7.8 U	7.8 U	2.3 U	1.6 U	41 U	7.8 UJV
Carbon Disulfide	UG/M3	16 UJV	16 U	170 U	16 UJV	**20**	**19**	**200**	**19**	**78 J**	**8.2 JV**
Carbon Tetrachloride	UG/M3	2.2 UJV	2.2 U	24 U	2.2 UJV	2.2 U	2.2 U	**0.65 J**	**0.39 J**	12 U	2.2 UJV
Chlorobenzene	UG/M3	9.2 UJV	9.2 U	100 U	9.2 UJV	9.2 U	9.2 U	2.8 U	1.8 U	49 U	9.2 UJV
Chloroethane	UG/M3	13 UJV	13 U	150 U	13 UJV	13 U	13 U	4 U	2.6 U	70 U	13 UJV

Table 13. Summary of Volatile Organic Compounds in Soil Vapor, 1221 Spofford Avenue, Bronx, New York

Sample Designation:		RXSS-2	RXSS-3	RXSS-4	RXSS-5	RXSV-10	RXSV-11	RXSV-12	RXSV-13	RXSV-14	RXSV-4
Sample Date:		06/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	05/23/2018	06/22/2018	06/22/2018	06/22/2018	06/04/2018
Normal or Field Duplicate:		N	N	N	N	N	N	N	N	N	N
Parameter	Unit										
Chloroform	UG/M3	9.8 UJV	9.8 U	110 U	9.8 UJV	9.8 U	9.8 U	**150**	**16**	**280**	9.8 UJV
Chloromethane	UG/M3	10 UJV	10 U	110 U	10 UJV	10 U	10 U	3.1 U	**1.2 J**	55 U	10 UJV
Cis-1,2-Dichloroethylene	UG/M3	1.4 UJV	1.4 U	15 U	1.4 UJV	1.4 U	1.4 U	0.42 U	0.28 U	7.4 U	1.4 UJV
Cis-1,3-Dichloropropene	UG/M3	9.1 UJV	9.1 U	100 U	9.1 UJV	9.1 U	9.1 U	2.7 U	1.8 U	48 U	9.1 UJV
Cyclohexane	UG/M3	6.9 UJV	**8.6**	**7200**	**3.4 JV**	**8.9**	6.9 U	**3.5**	**2.6**	37 U	6.9 UJV
Cymene	UG/M3	11 UJV	11 U	120 U	11 UJV	11 U	11 U	3.3 U	2.2 U	58 U	11 UJV
Dibromochloromethane	UG/M3	17 UJV	17 U	190 U	17 UJV	17 U	17 U	5.1 U	3.4 U	90 U	17 UJV
Dichlorodifluoromethane	UG/M3	25 UJV	25 U	270 U	25 UJV	25 U	25 U	7.4 U	**2.5 J**	130 U	25 UJV
Dichloroethylenes	UG/M3	16 UJV	16 U	170 U	16 UJV	16 U	16 U	4.8 U	3.2 U	84 U	16 UJV
Ethylbenzene	UG/M3	8.7 UJV	8.7 U	96 U	8.7 UJV	8.7 U	8.7 U	**57**	**2.2**	46 U	8.7 UJV
Hexachlorobutadiene	UG/M3	21 UJV	21 U	230 U	21 UJV	21 U	21 U	6.4 U	4.3 U	110 U	21 UJV
Isopropanol	UG/M3	120 UJV	120 U	1400 U	120 UJV	120 U	120 U	37 U	25 U	650 U	120 UJV
Isopropylbenzene (Cumene)	UG/M3	9.8 UJV	9.8 U	110 U	9.8 UJV	9.8 U	9.8 U	**2.8 J**	2 U	52 U	9.8 UJV
m,p-Xylene	UG/M3	22 UJV	22 U	240 U	22 UJV	22 U	22 U	**250**	**5.5**	**32 J**	22 UJV
Methyl Ethyl Ketone (2-Butanone)	UG/M3	**22 JV**	15 U	160 U	**6.4 JV**	15 U	15 UV	**2.3 J**	**1.9 J**	78 U	15 UJV
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	UG/M3	20 UJV	20 U	230 U	20 UJV	20 U	20 U	6.1 U	**4.3**	110 U	20 UJV
Methyl Methacrylate	UG/M3	20 UJV	20 U	230 U	20 UJV	20 U	20 U	6.1 U	4.1 U	110 U	20 UJV
Methylene Chloride	UG/M3	17 UJV	17 U	190 U	17 UJV	17 U	17 U	**6.4**	**1.9 J**	92 U	17 UJV
Naphthalene	UG/M3	26 UJV	26 U	290 U	26 UJV	26 U	26 U	7.9 U	5.2 U	140 U	26 UJV
N-Butylbenzene	UG/M3	11 UJV	11 U	120 U	11 UJV	11 U	11 U	3.3 U	2.2 U	58 U	11 UJV
N-Heptane	UG/M3	8.2 UJV	8.2 U	**520**	8.2 UJV	8.2 U	8.2 U	**1.8 J**	**8.4**	**77**	8.2 UJV
N-Hexane	UG/M3	7 UJV	7 U	**2500**	7 UJV	7 U	7 U	2.1 U	**4.8**	**310**	**6.3 JV**
N-Propylbenzene	UG/M3	9.8 UJV	9.8 U	110 U	9.8 UJV	9.8 U	9.8 U	**1.1 J**	2 U	52 U	9.8 UJV
O-Xylene (1,2-Dimethylbenzene)	UG/M3	8.7 UJV	8.7 U	96 U	8.7 UJV	8.7 U	8.7 U	**93**	**1.8**	46 U	8.7 UJV
Sec-Butylbenzene	UG/M3	11 UJV	11 U	120 U	11 UJV	11 U	11 U	3.3 U	2.2 U	58 U	11 UJV
Styrene	UG/M3	8.5 UJV	8.5 U	94 U	8.5 UJV	8.5 U	8.5 U	2.6 U	**1.1 J**	45 U	8.5 UJV
T-Butylbenzene	UG/M3	11 UJV	11 U	120 U	11 UJV	11 U	11 U	3.3 U	2.2 U	58 U	11 UJV
Tert-Butyl Alcohol	UG/M3	150 UJV	150 U	1700 U	**98 JV**	**45 J**	150 U	45 U	**13 J**	800 U	150 UJV
Tert-Butyl Methyl Ether	UG/M3	7.2 UJV	7.2 U	79 U	7.2 UJV	7.2 U	7.2 U	2.2 U	1.4 U	38 U	7.2 UJV
Tetrachloroethylene (PCE)	UG/M3	14 UJV	**9.3 J**	150 U	14 UJV	**5.3 J**	**8.9 J**	**46**	**5.1**	**13 J**	**4.1 JV**
Tetrahydrofuran	UG/M3	150 UJV	150 U	1600 U	150 UJV	150 U	150 U	44 U	29 U	780 U	150 UJV
Toluene	UG/M3	7.5 UJV	7.5 U	83 U	**3.8 JV**	**2.9 J**	**22**	**17**	**9.2**	**150**	7.5 UJV
Trans-1,2-Dichloroethene	UG/M3	7.9 UJV	7.9 U	87 U	7.9 UJV	7.9 U	7.9 U	2.4 U	1.6 U	42 U	7.9 UJV
Trans-1,3-Dichloropropene	UG/M3	9.1 UJV	9.1 U	100 U	9.1 UJV	9.1 U	9.1 U	2.7 U	1.8 U	48 U	9.1 UJV
Trichloroethylene (TCE)	UG/M3	1.9 UJV	**3.4**	**25**	1.9 UJV	1.9 U	1.9 U	**1.7**	**1.2**	10 U	1.9 UJV
Trichlorofluoromethane	UG/M3	11 UJV	11 U	120 U	11 UJV	11 U	11 U	**33**	**6.4**	60 U	11 UJV
Vinyl Bromide	UG/M3	8.7 UJV	8.7 U	96 U	8.7 UJV	8.7 U	8.7 U	2.6 U	1.7 U	46 U	8.7 UJV
Vinyl Chloride	UG/M3	0.89 UJV	0.89 U	9.8 U	0.89 UJV	0.89 U	0.89 U	0.27 U	0.18 U	4.8 U	0.89 UJV
Xylenes, Total	UG/M3	30 UJV	30 U	330 U	30 UJV	30 U	30 U	**340**	**7.4**	160 U	30 UJV

Table 13. Summary of Volatile Organic Compounds in Soil Vapor, 1221 Spofford Avenue, Bronx, New York

Sample Designation:		RXSV-5	RXSV-7	RXSV-9
Sample Date:		06/04/2018	06/04/2018	05/23/2018
Normal or Field Duplicate:		N	N	N
Parameter	Unit			
1,1,1-Trichloroethane (TCA)	UG/M3	19 U	11 U	11 U
1,1,2,2-Tetrachloroethane	UG/M3	23 U	14 U	14 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	UG/M3	26 U	15 U	15 U
1,1,2-Trichloroethane	UG/M3	19 U	11 U	11 U
1,1-Dichloroethane	UG/M3	14 U	8.1 U	8.1 U
1,1-Dichloroethene	UG/M3	2.4 U	1.4 U	**1.6**
1,2,4-Trichlorobenzene	UG/M3	63 UT	37 UT	37 U
1,2,4-Trimethylbenzene	UG/M3	17 U	9.8 U	9.8 U
1,2-Dibromoethane (Ethylene Dibromide)	UG/M3	26 U	15 U	15 U
1,2-Dichlorobenzene	UG/M3	20 U	12 U	12 U
1,2-Dichloroethane	UG/M3	14 U	8.1 U	8.1 U
1,2-Dichloropropane	UG/M3	16 U	9.2 U	9.2 U
1,2-Dichlorotetrafluoroethane	UG/M3	24 U	14 U	14 U
1,3,5-Trimethylbenzene (Mesitylene)	UG/M3	17 U	9.8 U	9.8 U
1,3-Butadiene	UG/M3	7.5 U	4.4 U	4.4 U
1,3-Dichlorobenzene	UG/M3	20 U	12 U	12 U
1,4-Dichlorobenzene	UG/M3	20 U	12 U	12 U
1,4-Dioxane (P-Dioxane)	UG/M3	310 U	180 U	180 U
2,2,4-Trimethylpentane	UG/M3	16 U	9.3 U	9.3 U
2-Chlorotoluene	UG/M3	18 U	10 U	10 U
2-Hexanone	UG/M3	35 U	20 U	20 U
4-Ethyltoluene	UG/M3	17 U	9.8 U	9.8 U
Acetone	UG/M3	**1400**	120 U	**630**
Allyl Chloride (3-Chloropropene)	UG/M3	27 U	16 U	16 U
Benzene	UG/M3	11 U	6.4 U	**6 J**
Benzyl Chloride	UG/M3	18 U	10 U	10 U
Bromodichloromethane	UG/M3	23 U	13 U	13 U
Bromoform	UG/M3	35 U	21 U	21 U
Bromomethane	UG/M3	13 U	7.8 U	7.8 U
Carbon Disulfide	UG/M3	**13 J**	**4.9 J**	**13 J**
Carbon Tetrachloride	UG/M3	3.7 U	2.2 U	2.2 U
Chlorobenzene	UG/M3	16 U	9.2 U	9.2 U
Chloroethane	UG/M3	22 U	13 U	13 U

Table 13. Summary of Volatile Organic Compounds in Soil Vapor, 1221 Spofford Avenue, Bronx, New York

Sample Designation:		RXSV-5	RXSV-7	RXSV-9
Sample Date:		06/04/2018	06/04/2018	05/23/2018
Normal or Field Duplicate:		N	N	N
Parameter	Unit			
Chloroform	UG/M3	**7.1 J**	9.8 U	9.8 U
Chloromethane	UG/M3	18 U	10 U	10 U
Cis-1,2-Dichloroethylene	UG/M3	2.4 U	1.4 U	1.4 U
Cis-1,3-Dichloropropene	UG/M3	15 U	9.1 U	9.1 U
Cyclohexane	UG/M3	**11 J**	6.9 U	**2.3 J**
Cymene	UG/M3	19 U	11 U	11 U
Dibromochloromethane	UG/M3	29 U	17 U	17 U
Dichlorodifluoromethane	UG/M3	42 U	25 U	25 U
Dichloroethylenes	UG/M3	27 U	16 U	16 U
Ethylbenzene	UG/M3	15 U	8.7 U	8.7 U
Hexachlorobutadiene	UG/M3	36 U	21 U	21 U
Isopropanol	UG/M3	210 U	120 U	120 U
Isopropylbenzene (Cumene)	UG/M3	17 U	9.8 U	9.8 U
m,p-Xylene	UG/M3	37 U	22 U	22 U
Methyl Ethyl Ketone (2-Butanone)	UG/M3	**31**	15 U	15 UV
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	UG/M3	35 U	20 U	20 U
Methyl Methacrylate	UG/M3	35 U	20 U	20 U
Methylene Chloride	UG/M3	30 U	17 U	17 U
Naphthalene	UG/M3	45 U	26 U	26 U
N-Butylbenzene	UG/M3	19 U	11 U	11 U
N-Heptane	UG/M3	14 U	8.2 U	8.2 U
N-Hexane	UG/M3	12 U	7 U	7 U
N-Propylbenzene	UG/M3	17 U	9.8 U	9.8 U
O-Xylene (1,2-Dimethylbenzene)	UG/M3	15 U	8.7 U	8.7 U
Sec-Butylbenzene	UG/M3	19 U	11 U	11 U
Styrene	UG/M3	14 U	8.5 U	8.5 U
T-Butylbenzene	UG/M3	19 U	11 U	11 U
Tert-Butyl Alcohol	UG/M3	260 U	150 U	**64 J**
Tert-Butyl Methyl Ether	UG/M3	12 U	7.2 U	7.2 U
Tetrachloroethylene (PCE)	UG/M3	**9.7 J**	14 U	**6 J**
Tetrahydrofuran	UG/M3	250 U	150 U	150 U
Toluene	UG/M3	13 U	7.5 U	**30**
Trans-1,2-Dichloroethene	UG/M3	13 U	7.9 U	7.9 U
Trans-1,3-Dichloropropene	UG/M3	15 U	9.1 U	9.1 U
Trichloroethylene (TCE)	UG/M3	3.2 U	1.9 U	1.9 U
Trichlorofluoromethane	UG/M3	19 U	11 U	11 U
Vinyl Bromide	UG/M3	15 U	8.7 U	8.7 U
Vinyl Chloride	UG/M3	1.5 U	0.89 U	0.89 U
Xylenes, Total	UG/M3	52 U	30 U	30 U

Table 14. Remedial Cost Estimate for Remedial Alternative 1, 1221 Spofford Avenue, Bronx, New York

Item	Description	Estimated Quantity	Unit	Unit Price	Cost
Capital Costs					
SITE PREPARATION[1]					
	Mobilization/Demobilization	1	LS	$200,000	$200,000
	Soil Staging Area, Decon Pad	1	LS	$50,000	$50,000
	Building Demolition, Building Debris Removal and Disposal	1	LS	$10,500,000	$10,500,000
	UST Removal	1	LS	$50,000	$50,000
	Permitting	1	LS	$50,000	$50,000
EXCAVATION					
	Pre-Excavation Soil Borings	1	LS	$20,000	$20,000
	Pre-Excavation Delineation Sampling	76	sample	$400	$30,400
	SOE (required by MTA and NYCDOB)	1	LS	$744,750	$744,750
	Dewatering and Water Treatment	1	LS	$200,000	$200,000
	Soil Excavation and Handling	29,000	CY	$25	$725,000
	Documentation Sampling	120	sample	$400	$48,000
	Backfill	12,230	CY	$55	$672,650
	Surveying	1	LS	$20,000	$20,000
	Waterproofing Membrane/Vaport Barrier[4]	120000	SF	$10	$1,200,000
DISPOSAL					
	Solid Waste Transportation and Disposal	43500	tons	$65	$2,827,500
	Hazardous Waste Transportation and Disposal < 60 ppm PCE	0	tons	$241	$0
GROUNDWATER TREATMENT					
	Monitoring Well Abandonment	1	LS	$13,750	$13,750
	Monitoring Well Installation	1	LS	$10,000	$10,000
	Baseline Groundwater Sampling	1	LS	$6,000	$6,000
	In-Situ Chemical Oxidation Injections[2]	1	LS	$230,000	$230,000
	Hazardous Waste Transportation and Disposal < 60 ppm PCE	0	tons	$241	$0
				Subtotal Remediation Construction Cost	**$17,598,050**
Supplemental Remedial Costs					
	Remedial Investigation Implementation	1	LS	$195,000	$195,000
	In Situ Waste Characterization	1	LS	$100,000	$100,000
	Backfill Sampling for VOCs	32	each	$65	$2,080
	Backfill Sampling for all other parameters	15	each	$580	$8,700
	Data Usability Summary Report	1	LS	$15,600	$15,600
	Vapor, Dust, and Odor Suppression	6	Month	$25,000	$150,000
	Community Air Monitoring Plan (CAMP) Implementation (during excavation and soil handling), Field Oversight and Engineering Support/Disposal Coordination	6	Month	$45,000	$270,000
				Subtotal Supplemental Remediation Cost	**$741,380**
Brownfield Cleanup Program (BCP) Reporting/Record Keeping					
	Remedial Investigation Work Plan, Remedial Investigation Report, Remedial Action Work Plan	1	LS	$88,000	$88,000
	Remedial Design	1	LS	$20,000	$20,000
	Monthly Reporting, Fact Sheets, Citizen Participation Activities	12	Month	$6,500	$78,000
	Final Engineering Report	1	LS	$40,000	$40,000
				Subtotal Supplemental BCP Reporting and Record Keeping	**$226,000**
			Contingency	**20%**	**$3,713,086**
			Sales Tax		**$1,561,827**
				TOTAL REMEDIAL CONSTRUCTION, SUPPLEMENTAL AND BCP RECORD KEEPING/REPORTING	**$23,840,343**
Annual Monitoring Cost for Years 1 and 2					
	Groundwater Sampling[3]	1	LS	$24,000	$24,000
	Quarterly Reporting	1	LS	$12,500	$12,500
	Data Usability Summary Report	1	LS	$1,300	$1,300
				TOTAL ANNUAL MONITORING COST/YEAR FOR YEARS 1 AND 2	**$37,800**

1. Building demolition is required for Track 1 Cleanup. Costs for demolition and disposal of building/foundation debris of the building are included.
2. Assumes one injection round is required.
3. Assumes four post injection groundwater sampling rounds per year from seven wells for VOCs only for two years. No monitoring is assumed after two years.
4. Includes a waterproofing membrane/vapor barrier for all buildings to mitigate for potential future vapor intrusion issues.

Table 15. Remedial Cost Estimate for Remedial Alternative 2, 1221 Spofford Avenue, Bronx, New York

Item	Description	Estimated Quantity	Unit	Unit Price	Cost
Capital Costs					
SITE PREPARATION[1]					
	Mobilization/Demobilization	1	LS	$200,000	$200,000
	Soil Staging Area, Decon Pad	1	LS	$50,000	$50,000
	UST Removal	1	LS	$50,000	$50,000
	Permitting	1	LS	$50,000	$50,000
EXCAVATION[1]					
	Pre-Excavation Soil Borings	1	LS	$10,000	$10,000
	Pre-Excavation Delineation Sampling	65	sample	$400	$26,000
	SOE (required by MTA and NYCDOB)	1	LS	$234,600	$234,600
	Dewatering and Water Treatment	1	LS	$70,000	$70,000
	Soil Excavation and Handling	4,270	CY	$25	$106,750
	Documentation Sampling	54	sample	$645	$34,830
	Backfill	1,628	CY	$55	$89,540
	Surveying	1	LS	$20,000	$20,000
DISPOSAL[1]					
	Solid Waste Transportation and Disposal	6405	tons	$65	$416,325
GROUNDWATER TREATMENT					
	Monitoring Well Abandonment	1	LS	$13,750	$13,750
	Monitoring Well Installation	1	LS	$10,000	$10,000
	Baseline Groundwater Sampling	1	LS	$6,000	$6,000
	In-Situ Chemical Oxidation Injections[2]	1	LS	$230,000	$230,000
	Hazardous Waste Transportation and Disposal < 60 ppm PCE	0	tons	$241	$0
SITE COVER SYSTEM[4]					
	Building Foundations/Walkways	120000	SF	$27	$3,240,000
	Waterproofing Membrane/Vaport Barrier[4]	120000	SF	$10	$1,200,000
	Asphalt Pavement	0	SF	$4	$0
	Landscaped Areas with Two Feet of Clean Backfill	40000	SF	$4	$160,000
			Subtotal Remediation Construction Cost		**$6,217,795**
Supplemental Remedial Costs					
	Remedial Investigation Implementation	1	LS	$195,000	$195,000
	In Situ Waste Characterization	1	LS	$100,000	$100,000
	Backfill Sampling for VOCs	9	each	$65	$585
	Backfill Sampling for all other parameters	3	each	$580	$1,740
	Data Usability Summary Report	1	LS	$7,020	$7,020
	Vapor, Dust, and Odor Suppression	2	Month	$25,000	$50,000
	Community Air Monitoring Plan (CAMP) Implementation (during excavation and soil handling), Field Oversight and Engineering Support/Disposal Coordination	2	Month	$45,000	$90,000
			Subtotal Supplemental Remediation Cost		**$444,345**
Brownfield Cleanup Program (BCP) Reporting/Record Keeping					
	Remedial Investigation Work Plan, Remedial Investigation Report, Remedial Action Work Plan	1	LS	$88,000	$88,000
	Remedial Design	1	LS	$15,000	$15,000
	Monthly Reporting, Fact Sheets, Citizen Participation Activities	12	Month	$6,500	$78,000
	Final Engineering Report/Site Management Plan	1	LS	$70,000	$70,000
			Subtotal Supplemental BCP Reporting and Record Keeping		**$251,000**
		Contingency	**20%**		**$1,382,628**
		Sales Tax			**$551,829**
			TOTAL REMEDIAL CONSTRUCTION, SUPPLEMENTAL AND BCP RECORD KEEPING/REPORTING		**$8,847,597**
Annual Monitoring Cost for Years 1 and 2					
	Groundwater Sampling[3]	1	LS	$24,000	$24,000
	Quarterly Reporting	1	LS	$12,500	$12,500
	Annual Inspection of Institutional Controls and Periodic Report	1	LS	$10,500	$10,500
	Data Usability Summary Report	1	LS	$1,300	$1,300
			TOTAL ANNUAL MONITORING COST/Year		**$48,300**
Annual Monitoring Cost for Years 3 and Over					
	Annual Inspection of Institutional Controls and Periodic Report	1	LS	$12,000	$12,000
			TOTAL ANNUAL MONITORING COST/YEAR FOR YEARS 1 AND 2		**$12,000**

1. Assumes excavation and backfill of the UST petroleum source area only.
2. Assumes one injection round is required.
3. Assumes four post injection groundwater sampling rounds per year from four wells for VOCs only for two years.
4. Includes a waterproofing membrane/vapor barrier for all buildings to mitigate for potential future vapor intrusion issues.

Table 16. Proposed Schedule

Remedial Investigation Schedule – Revised 9-6-2018		
NYSDEC Approval of RIWP	February 2018	
Remedial Investigation (Phase 1 /Phase 2)	April / May 2018	
Phase I UST Removal	July 2018	
Submit RIR to NYSDEC	August 2018	
Submit RAWP to NYSDEC	September 2018	
DEC and NYSDOH Review of RIR and RAWP	September 2018	
Begin Phase I Building Demolition - mechanical Demolition with subgrade feature removal on West Side of Building (Tiffany Street)	September 2018	CAMP and Oversight required once soil is disturbed until inert temporary site cover is placed back on the exposed soil surfaces including 6" of stone
DEC and NYSDOH Approval of RIR and RAWP	October 2018	
DEC Issue RIR and RAWP Fact Sheet	October 2018	One week after final approval of RIR (anticipated mid-October)
Public Comment Period for RAWP	October to December 2018	
Complete Waste Characterization for Foundation Construction Phase I	November 2018	To be completed prior to RAWP approval due to construction schedule
Address Comments and issue certified RAWP	December 15, 2018	
DEC Approval of RAWP	January 1, 2019	
Begin Phase II Building Demolition - mechanical Demolition with subgrade feature removal on East Side of Building (Spofford)	January 2019	
Begin Excavation for Foundation Construction Phase I	January 2019	
Phase II UST Removal	February 2019	
Complete Waste Characterization for Foundation Construction Phase II	March 2019	
Complete Excavation and Foundation Construction Phase I	April 2019	
Begin Excavation for Foundation Construction Phase II	Jan 2020	
Complete Excavation and Foundation Construction Phase II	May 2020	
Submit Site Management Plan (if necessary)	May 2020	Prepare Draft May 2020 to allow remaining construction to proceed under SMP if required
Submit Final Engineering Report	Summer 2020	Anticipate approval by end of 2020 to gain 2020 Certificate of Completion.

Table 17. Summary Of Permits, 1221 Spofford Avenue Site, Bronx, New York

Regulatory Agency	Permit
NYCCPC	Uniform Land Use Review Procedure (ULURP)
NYCDEP	Dewatering Permit (for temporary discharge during construction)
NYCDEP	Sewer Certification and Sewer Permit (for new building connection)
NYCDOB	Demolition Permit
NYCDOB	New Building (NB) Permit
NYCDOB	Fence Permit
NYCDOB	Foundation/Earthwork Permit
NYCDOB	Builder's Paving Plan
NYCDOB	Underground Plumbing Permit
NYCDOT	Sidewalk Opening Permit (for monitoring well installation)
NYCDPR	Building Plan Review (street trees)
USEPA	Underground Injection Control Program Form (ISCO injections)

Note: This list only accounts for permits required from the street level and below. Permits for aboveground portions of the building are not listed.

NYCDEP - New York City City Planning Commission
NYCDEP - New York City Department of Environmental Protection
NYCDOB - New York City Department of Buildings
NYCDOT - New York City Department of Transportation
NYCDPR - New York City Department of Parks & Recreation
NYSDEC - New York State Department of Environmental Conservation
USEPA - United States Environmental Protection Agency
ISCO - In Situ Chemical Oxidation

TABLE 18

Project Management/Health and Safety Personnel

Title	Contact	Telephone/Cell
The Peninsula JV, LLC (Volunteer)		
Project Manager	Blaise Rastello	(401) 588-3150/ (301) 646-7537
Roux		
Project Principal	Frank Cherena	(631) 232-2600/ (631) 445-0357
Principal Engineer	Brian Morrissey	(631) 232-2600/ (631) 921-6355
Field Manager/Site Safety Officer	TBD	TBD
Corporate Health and Safety Manager	Brian Hobbs	(631) 232-2600/ (631) 807-0193
Office Health and Safety Manager	Levi Curnutte	(631) 232-2600

Emergency Phone Numbers

Emergency Medical Service 911

Police: NYPD 911

Fire: FDNY 911

Hospital: Bronx Lebanon Hospital.....718-860-6169

National Response Center.....800-424-8802

Poison Control Center.....800-222-1222

CHEMTREC® 800-262-8200

Centers for Disease Control.....800-232-4636

USEPA (Region II).....212-637-3000

NYSDEC Emergency Spill Response.....800-457-7362

Table 19. Tracks 1 and 4 Soil Cleanup Objectives, 1221 Spofford Avenue Site, Bronx, New York

Parameter	Track 1 Soil Cleanup Objectives*	Track 4 Soil Cleanup Objectives**
Volatile Organic Compounds (Concentrations in µg/kg)		
1,1,1-Trichloroethane	680	680
1,1-Dichloroethane	270	270
1,1-Dichloroethene	330	330
1,2,4-Trimethylbenzene	3600	3600
1,3,5-Trimethylbenzene	8400	8400
1,2-Dichlorobenzene	1100	1100
1,2-Dichloroethane	20	20
1,3-Dichlorobenzene	2400	2400
1,4-Dichlorobenzene	1800	1800
1,4-Dioxane	100	100
2-Butanone (MEK)	120	120
Acetone	50	50
Benzene	60	60
n-Butylbenzene	12000	12000
Carbon tetrachloride	760	760
Chlorobenzene	1100	1100
Chloroform	370	370
cis-1,2-Dichloroethene	250	250
Ethylbenzene	1000	1000
Methylene chloride	50	50
MTBE	930	930
n-Propylbenzene	3900	3900
sec-Butylbenzene	11000	11000
tert-Butylbenzene	5900	5900
Tetrachloroethene	1300	1300
Toluene	700	700
trans-1,2-Dichloroethene	190	190
Trichloroethene	470	470
Vinyl chloride	20	20
Xylenes (total)	1600	260
Semivolatile Organic Compounds (Concentrations in µg/kg)		
2-Methylphenol	330	330
3&4-Methylphenol	330	330
Acenaphthene	98000	20000
Acenaphthylene	100000	100000
Anthracene	100000	100000
Benzo[a]anthracene	1000	1000
Benzo[a]pyrene	1000	1000
Benzo[b]fluoranthene	1000	1000
Benzo[g,h,i]perylene	100000	100000
Benzo[k]fluoranthene	1700	800
Chrysene	1000	1000
Dibenzo[a,h]anthracene	330	330
Dibenzofuran	59000	7000
Fluoranthene	100000	100000
Fluorene	100000	3000
Hexachlorobenzene	1200	330
Indeno[1,2,3-cd]pyrene	500	500
Naphthalene	12000	12000
Pentachlorophenol	800	800
Phenanthrene	100000	100000
Phenol	330	330
Pyrene	100000	100000

Table 19. Tracks 1 and 4 Soil Cleanup Objectives, 1221 Spofford Avenue Site, Bronx, New York

Parameter	Track 1 Soil Cleanup Objectives*	Track 4 Soil Cleanup Objectives**
Metals (Concentrations in mg/kg)		
Arsenic	16	13
Barium	400	350
Beryllium	47	7.2
Cadmium	4.3	2.5
Chromium, Hexavalent	19	1
Chromium	180	30
Copper	270	50
Cyanide, Total	27	27
Lead	400	63
Manganese	2000	1600
Mercury	0.73	0.18
Nickel	130	30
Selenium	4	3.9
Silver	8.3	2
Zinc	2480	109
Pesticides (Concentrations in µg/kg)		
2,4,5-TP	3800	3800
4,4'-DDD	13000	3.3
4,4'-DDE	8900	3.3
4,4'-DDT	7900	3.3
Aldrin	97	5
alpha-BHC	20	20
alpha-Chlordane	2900	94
beta-BHC	90	36
delta-BHC	250	40
Dieldrin	100	5
Endosulfan I	24000	2400
Endosulfan II	24000	2400
Endosulfan sulfate	24000	2400
Endrin	60	14
gamma-BHC (Lindane)	100	100
Heptachlor	380	42
Pentachlorophenol	800	800
Total Polychlorinated Biphenyls (Concentrations in µg/kg)		
Total Polychlorinated Biphenyls	1000	100

* Soil cleanup objectives for the Track 1 remedy are the NYSDEC Part 375 Unrestricted Residential Use SCOs.

** Soil cleanup objectives for theTrack 4 remedy are the lower of the NYSDEC Part 375 Protection of Groundwater or Restricted Residential Use SCOs.

µg/kg - Micrograms per kilogram

mg/kg - Milligrams per kilogram

NYSDEC - New York State Department of Environmental Conservation

SCOs - Soil Cleanup Objectives

Table 20. Backfill/On-Site Soil Reuse Soil Cleanup Objectives, 1221 Spofford Avenue Site, Bronx, New York

Parameter	Track 1 Backfill/Soil Reuse Soil Cleanup Objectives*	Track 4 Backfill/Soil Reuse Soil Cleanup Objectives**
Volatile Organic Compounds (Concentrations in µg/kg)		
1,1,1-Trichloroethane	680	680
1,1-Dichloroethane	270	270
1,1-Dichloroethene	330	330
1,2,4-Trimethylbenzene	3600	3600
1,3,5-Trimethylbenzene	8400	8400
1,2-Dichlorobenzene	1100	1100
1,2-Dichloroethane	20	20
1,3-Dichlorobenzene	2400	2400
1,4-Dichlorobenzene	1800	1800
1,4-Dioxane	100	100
2-Butanone (MEK)	120	120
Acetone	50	50
Benzene	60	60
n-Butylbenzene	12000	12000
Carbon tetrachloride	760	760
Chlorobenzene	1100	1100
Chloroform	370	370
cis-1,2-Dichloroethene	250	250
Ethylbenzene	1000	1000
Methylene chloride	50	50
MTBE	930	930
n-Propylbenzene	3900	3900
sec-Butylbenzene	11000	11000
tert-Butylbenzene	5900	5900
Tetrachloroethene	1300	1300
Toluene	700	700
trans-1,2-Dichloroethene	190	190
Trichloroethene	470	470
Vinyl chloride	20	20
Xylenes (total)	1600	260
Semivolatile Organic Compounds (Concentrations in µg/kg)		
2-Methylphenol	330	330
3&4-Methylphenol	330	330
Acenaphthene	98000	20000
Acenaphthylene	100000	100000
Anthracene	100000	100000
Benzo[a]anthracene	1000	1000
Benzo[a]pyrene	1000	1000
Benzo[b]fluoranthene	1000	1000
Benzo[g,h,i]perylene	100000	100000
Benzo[k]fluoranthene	1700	800
Chrysene	1000	1000
Dibenzo[a,h]anthracene	330	330
Dibenzofuran	59000	7000
Fluoranthene	100000	100000
Fluorene	100000	3000
Hexachlorobenzene	1200	330
Indeno[1,2,3-cd]pyrene	500	500
Naphthalene	12000	12000
Pentachlorophenol	800	800
Phenanthrene	100000	100000
Phenol	330	330
Pyrene	100000	100000

Table 20. Backfill/On-Site Soil Reuse Soil Cleanup Objectives, 1221 Spofford Avenue Site, Bronx, New York

Parameter	Track 1 Backfill/Soil Reuse Soil Cleanup Objectives*	Track 4 Backfill/Soil Reuse Soil Cleanup Objectives**
Metals (Concentrations in mg/kg)		
Arsenic	16	13
Barium	400	350
Beryllium	47	7.2
Cadmium	4.3	2.5
Chromium, Hexavalent	19	1
Chromium	180	30
Copper	270	50
Cyanide, Total	27	27
Lead	400	63
Manganese	2000	1600
Mercury	0.73	0.18
Nickel	130	30
Selenium	4	3.9
Silver	8.3	2
Zinc	2480	109
Pesticides (Concentrations in µg/kg)		
2,4,5-TP	3800	3800
4,4'-DDD	13000	3.3
4,4'-DDE	8900	3.3
4,4'-DDT	7900	3.3
Aldrin	97	5
alpha-BHC	20	20
alpha-Chlordane	2900	94
beta-BHC	90	36
delta-BHC	250	40
Dieldrin	100	5
Endosulfan I	24000	2400
Endosulfan II	24000	2400
Endosulfan sulfate	24000	2400
Endrin	60	14
gamma-BHC (Lindane)	100	100
Heptachlor	380	42
Pentachlorophenol	800	800
Total Polychlorinated Biphenyls (Concentrations in µg/kg)		
Total Polychlorinated Biphenyls	1000	100

* Backfill soil cleanup objectives for the Track 1 remedy are the NYSDEC Part 375 Unrestricted Residential Use SCOs.

** Backfill soil cleanup objectives for the Track 4 remedy are the lower of the NYSDEC Part 375 Protection of Groundwater or Restricted Residential Use SCOs.

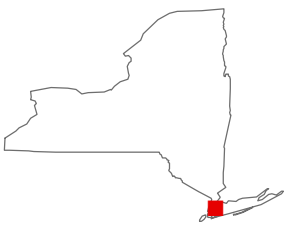
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
NYSDEC - New York State Department of Environmental Conservation
SCOs - Soil Cleanup Objectives

FIGURES

1. Site Location Map
2. Site Plan with Adjacent Property Owners
3. Remedial Investigation Sampling Locations
4. Groundwater Contour Map
5. Truck Routes
6. Proposed Development Plan
7. Alph-Numeric Map

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

SITE LOCATION



N

1,000 0 1,000 2,000

Feet

Title:

SITE LOCATION MAP

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE, BRONX, NY

Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: D.M.H.	Date: 06SEP18
Prepared by: M.S.R.	Scale: AS SHOWN
Project Mgr: J.W.	Project: 2611.0002Y000
File: 2611.0002Y121.1.mxd	

FIGURE 1

V:\GIS\Projects\2611\0002Y\121\2611.0002Y121.1.mxd

LEGEND

A 1221 SPOFFORD AVENUE, (AKA 707 BARRETTO STREET), BLOCK 2738, LOT 35
FORMER JUVENILE DETENTION CENTER
OWNER: CITY OF NEW YORK

B 1320 LAFAYETTE AVENUE, BLOCK 2738, LOT 1
OWNERS CORPUS CHRISTI MONASTERY

C 711 MANDIA STREET, BLOCK 2763, LOT 29
LA PENINSULA COMMUNITY ORGANIZATION, INC. HEAD START. OWNER: CITY OF NEW YORK

D 765 MANIDA STREET, BLOCK 2763, LOTS 1&3
HUNTS POINT RECREATION CENTER/ JULIO CARBALLO FIELDS.
OWNER: DEPARTMENT OF GENERAL SERVICES

E 1165 BURNETT PLACE, BLOCK 2737, LOT 102
OWNER: ELRO II, INC

F 1176 BURNETT PLACE, BLOCK 2737, LOT 29
OWNER: NEW YORK SPORT FOUNDATION

G 709 TIFFANY STREET, BLOCK 2737, LOT 130
OWNER: SAKB REALTY CORP.

H 1195 SPOFFORD AVENUE, BLOCK 2737, LOT 134
OWNER: BISOLA DIST

I 1202 SPOFFORD AVENUE, BLOCK 2765, LOT 78
OWNER: 1202 REALTY ASSOCIATE

J 667 CASANOVA STREET, BLOCK 2765, LOT 79.
OWNER: HUNTS POINT HOUSING DEVELOPMENT FUND CORP.

K 1220 SPOFFORD AVENUE, BLOCK 2765, LOT 138
OWNER: NUNZIO DEL FRECCO REALTY

L 1230 SPOFFORD AVENUE, BLOCK 2765, LOT 140
OWNER: 1230 SPOFFORD AVE HDF

M 670 BARRETTO STREET, BLOCK 2765, LOT 198
OWNER: MELSY REALTY CORP.

SITE BOUNDARY

50 0 50 100
Feet

Title:

SITE PLAN WITH ADJACENT PROPERTY OWNERS

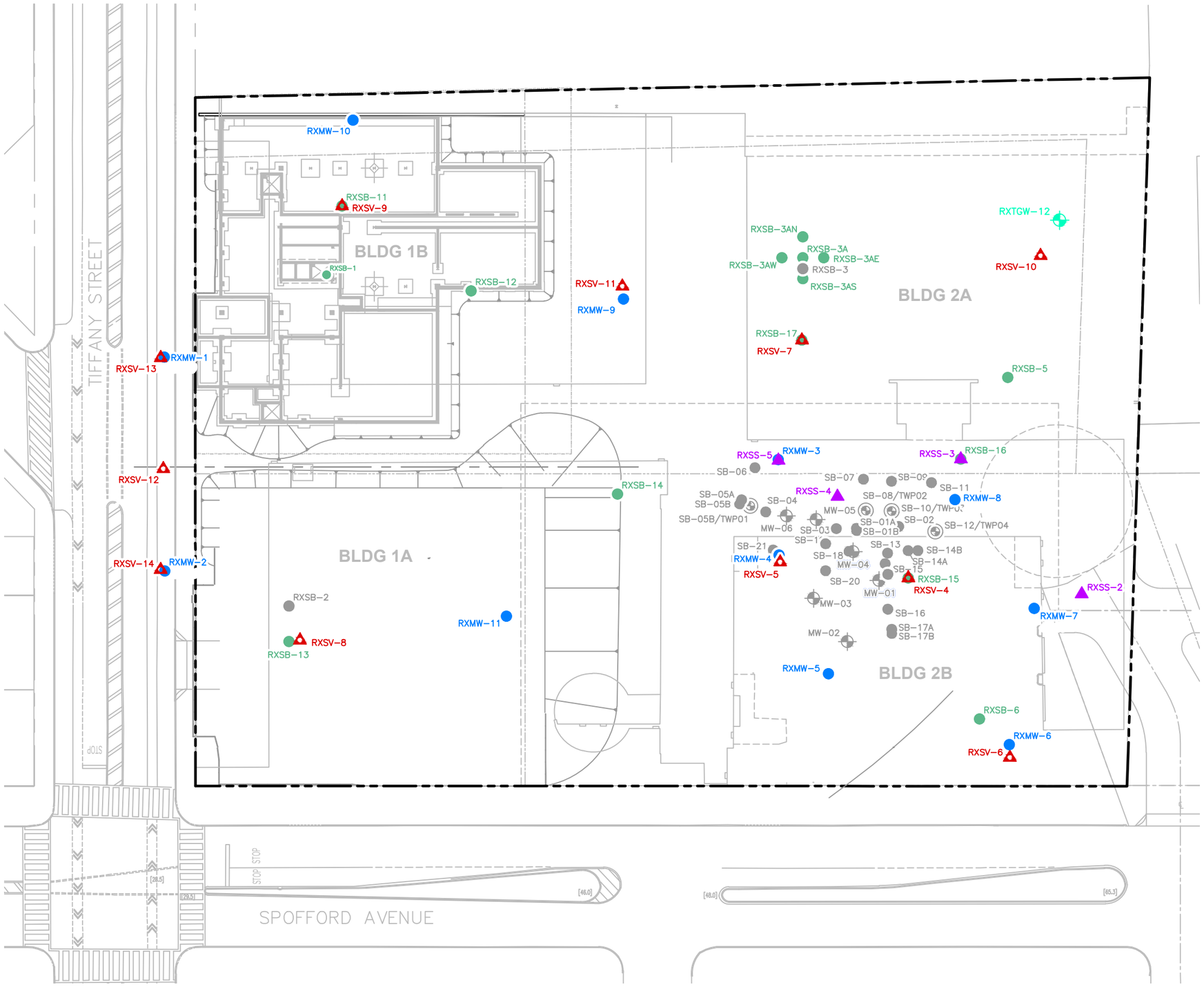
REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE, BRONX, NY

Prepared For:
THE PENINSULA JV, LLC

ROUX

Compiled by: D.M.H.	Date: 06SEP18	FIGURE
Prepared by: M.R.	Scale: AS SHOWN	2
Project Mgr: J.W.	Project: 2611.0002Y000	
File: 2611.0002Y121.2.mxd		

V:\GIS\Projects\2611\0002Y\121\2611.0002Y121.2.mxd



LEGEND

- SITE BOUNDARY
- RXMW-1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW-12 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB-15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV-4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS-2 — SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 / RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION

50' 0 50'

Title:

REMEDIAL INVESTIGATION SAMPLING LOCATIONS

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

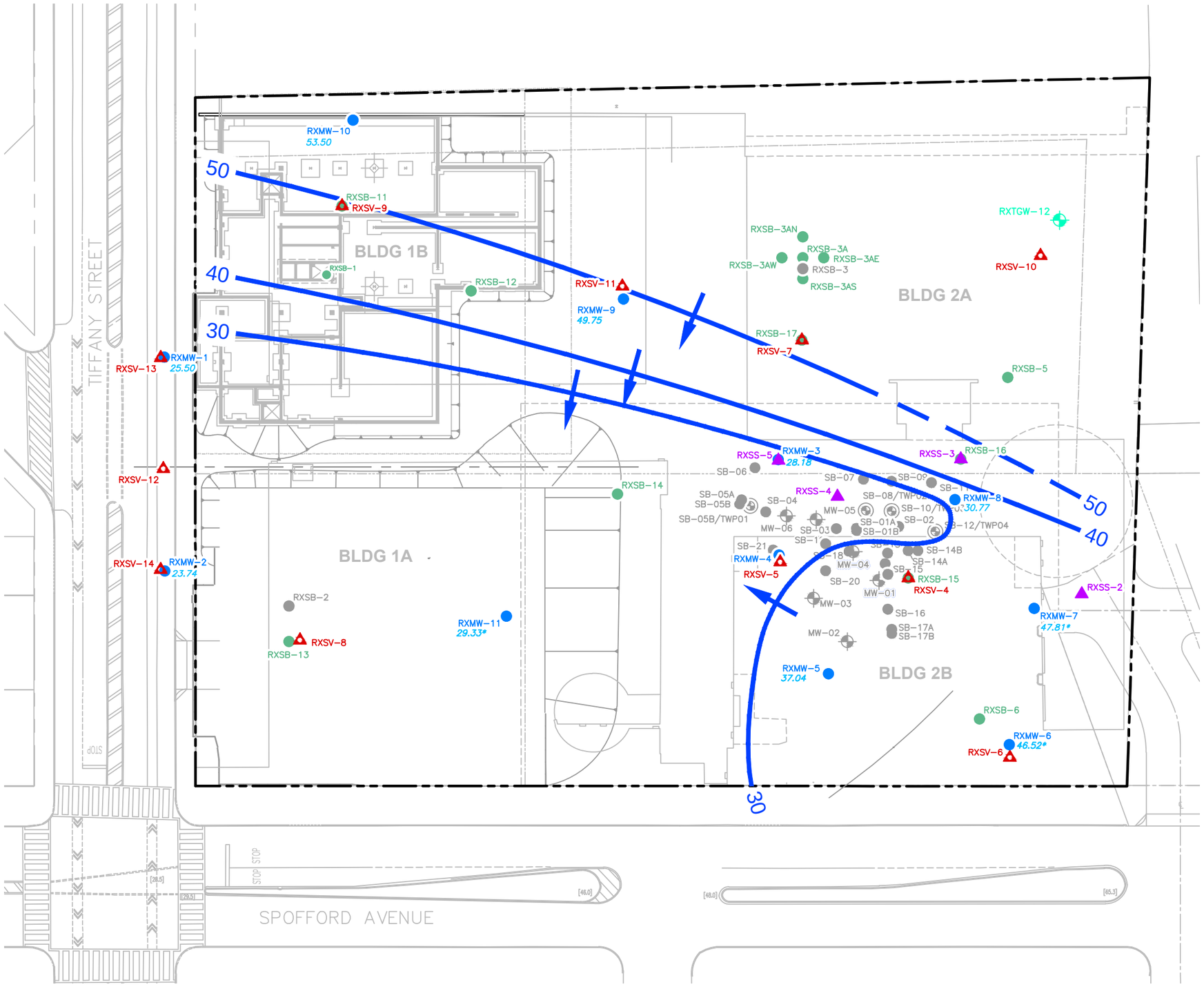
Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: J.W.	Date: 5SEPT18	FIGURE 3
Prepared by: G.M.	Scale: AS SHOWN	
Project Mgr: J.W.	Project: 2611.0002Y000	
File: 2611.0002Y121.05.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.05.DWG



LEGEND

- SITE BOUNDARY
- RXMW-1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW-12 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB-15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV-4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS-2 — SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 / RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- 30.77 — GROUNDWATER ELEVATION (FEET RELATIVE TO NAVD 88)
- 40 — GROUNDWATER CONTOUR ELEVATION (FEET RELATIVE TO NAVD 88) (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- * GROUNDWATER ELEVATION NOT USED IN CONSTRUCTION OF CONTOUR

50' 0 50'

Title:

REMEDIAL INVESTIGATION SAMPLING LOCATIONS

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: J.W.	Date: 5SEPT18	FIGURE 4
Prepared by: G.M.	Scale: AS SHOWN	
Project Mgr: J.W.	Project: 2611.0002Y000	
File: 2611.0002Y121.05.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.05.DWG

LEGEND

- TRUCK EGRESS ROUTE
- TRUCK INGRESS ROUTE
- SITE BOUNDARY

N

1,250 0 1,250 Feet

Title:

TRUCK ROUTE MAP

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE, BRONX, NY

Prepared For:

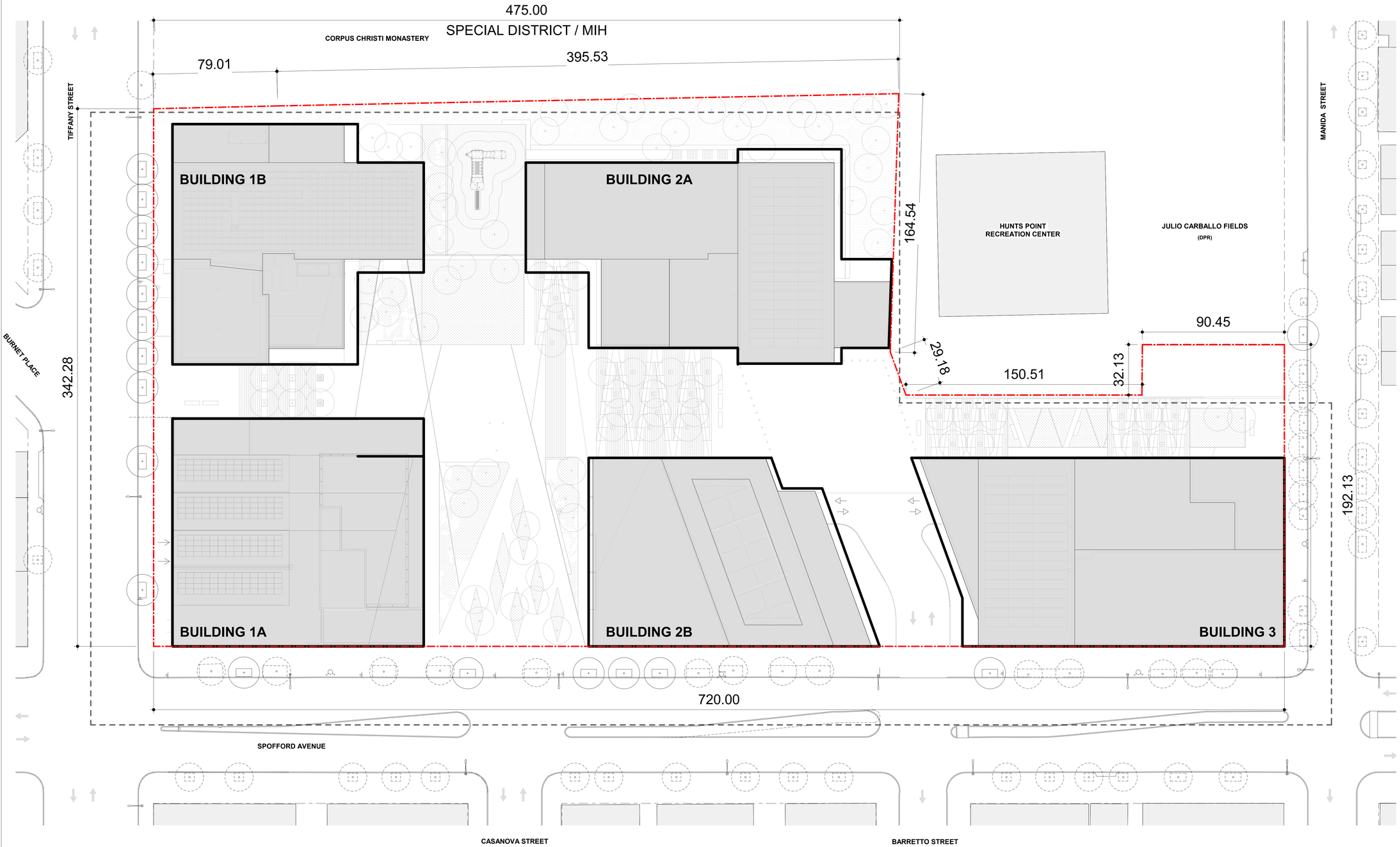
THE PENINSULA JV, LLC

ROUX

Compiled by: D.M.H.	Date: 13SEP18
Prepared by: M.S.R.	Scale: AS SHOWN
Project Mgr: J.W.	Project: 2611.0002Y000
File: 2611.0002Y121.3.mxd	

FIGURE 5

V:\GIS\Projects\2611\0002Y\121\2611.0002Y121.3.mxd



Legend

- Large Scale General Boundary
- Zoning Lot Line
- Proposed Zoning Envelope
- Illustrative Building
- Existing Context Building

Scale: 1" = 25'

0' 15' 30' 60'

N

Architect

bl4+WXY

224 Centre Street, 5th Floor
New York, NY 10013
P (212) 219-1953
F (212) 334-1952

Landscape Architect

Elizabeth Kennedy Landscape Architect
63 Flushing Avenue, Unit 264
Brooklyn, NY 11205
(718) 596-8837

Rev.	Date	Description

Project SPLW

Spofford Campus Redevelopment

Bronx, New York

Client

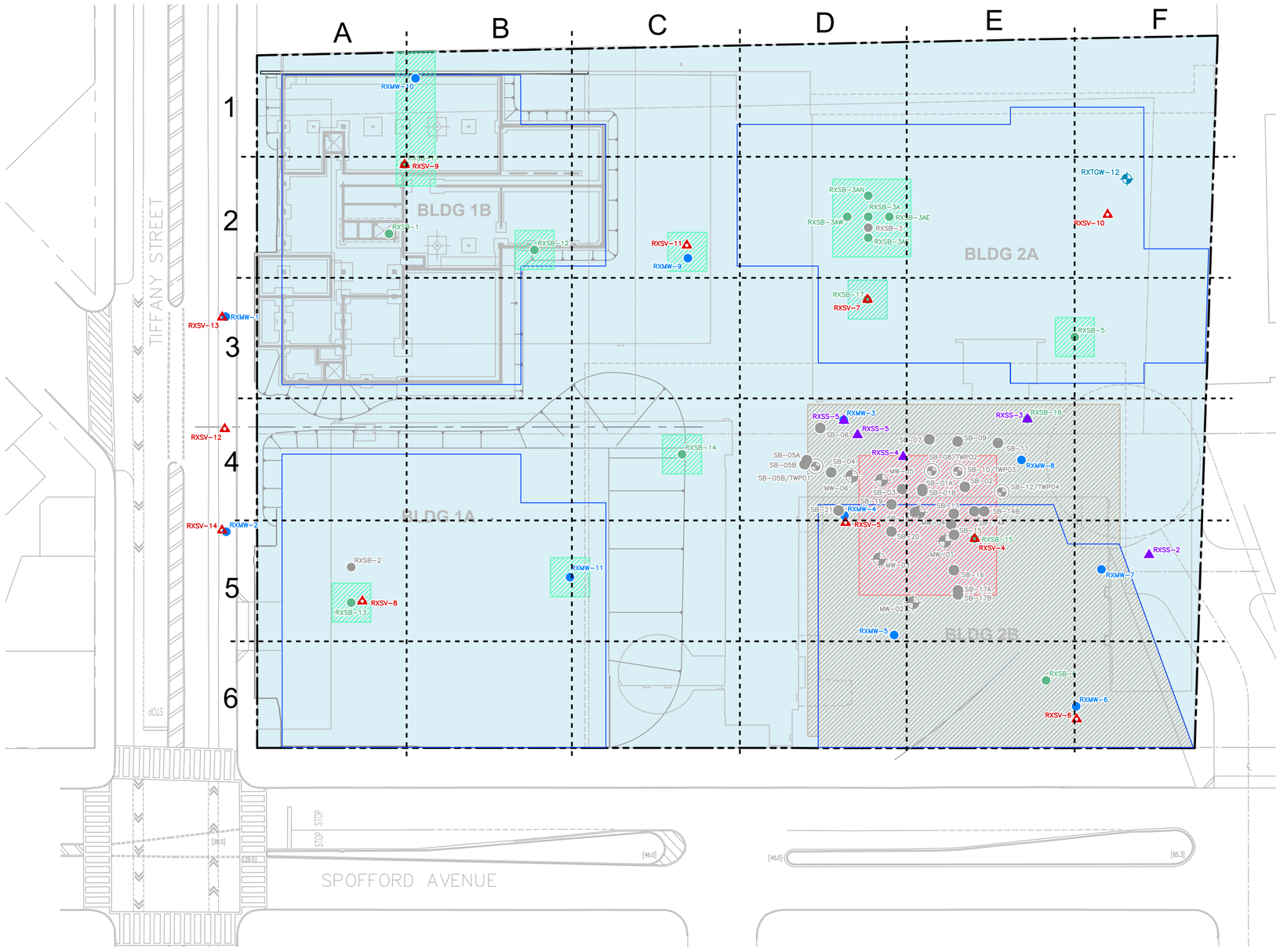
The Peninsula JV LLC

Seal

Drawing Title

SITE PLAN

Drawn by	Author
Checked by	Checker
Date	
Scale	As indicated
Drawing Number	FIGURE 6
Sheet Number	OF
Sheet Size	ARCH E1



LEGEND

- SITE BOUNDARY
- LOCATION OF PROPOSED BUILDING
- RXMW-1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW-12 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB-15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV-4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS-2 — SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 / RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- MW-06 — MONITORING WELL RESAMPLING LOCATION AND DESIGNATION
- PROPOSED EXCAVATION AREA BASED ON UST PETROLEUM SOURCE AREA (DEPTH TO BEDROCK)
- PROPOSED EXCAVATION AREA BASED ON UNRESTRICTED USE SOIL CLEANUP OBJECTIVES EXCEEDANCES (LIMITS AND DEPTH TO BE DELINEATED DURING PRE-EXCAVATION SAMPLING)
- PROPOSED EXCAVATION AREA BASED ON UNRESTRICTED USE SOIL CLEANUP OBJECTIVES EXCEEDANCES (DEPTH TO 10 FEET OR BEDROCK)
- EXCAVATION OF 2 FEET OF SOIL ACROSS ENTIRE SITE
- 1 A — **ALPHA-NUMERIC WORK AREA**

NOTES

1. AS PART OF TRACK 1 REMEDIAL ACTIVITIES, 2 FEET OF SOIL WILL BE REMOVED ACROSS THE SITE AND TRANSPORTED OFFSITE FOR DISPOSAL.
2. SUPPORT OF EXCAVATION (SOE) IS SHOWN FOR PROPOSED BUILDINGS 1A AND 1B. PROPOSED BUILDINGS 2A AND 2B ARE IN THE PRELIMINARY DESIGN PHASE, THEREFORE, SOE INFORMATION IS NOT YET AVAILABLE.

40' 0 40'

Title:

ALPHA-NUMERIC MAP

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: D.H.	Date: 5SEPT18	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	7
Project Mgr: D.H.	Project: 2611.0002Y000	
File: 2611.0002Y121.04.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.04.DWG

APPENDICES

A. New York State Department of Health Significant Threat Letter
B. Tax Map
C. Site Health and Safety Plan and Community Air Monitoring (HASP and CAMP)
D. Quality Assurance Project Plan
E. Citizens Participation Plan
F. Resumes of Key Personnel
G. Vapor Barrier Specifications

APPENDIX A

New York State Department of Health Significant Threat Letter

NEW YORK STATE OF OPPORTUNITY. Department of Health

ANDREW M. CUOMO
Governor

HOWARD A. ZUCKER, M.D., J.D.
Commissioner

SALLY DRESLIN, M.S., R.N.
Executive Deputy Commissioner

October 19, 2018

Gerard Burke, Director
Remedial Bureau B
Division of Environmental Remediation
NYS Dept. of Environmental Conservation
625 Broadway
Albany, NY 12233

Re: **Significant Threat Determination**
The Peninsula Site
#C203097
Bronx, Bronx County

Dear Mr. Burke,

At your Department's request, we have reviewed the August 2018 *Remedial Investigation Report* and the September 2018 *Remedial Action Work Plan* for the above referenced site. Based on that review, I understand that on-site soil is contaminated with metals and petroleum-related semi volatile organic compounds (SVOCs) exceeding restricted-residential use soil cleanup objectives. Groundwater on-site is contaminated with metals and petroleum-related volatile organic compounds (VOCs) above NYSDEC Ambient Water Quality Standards and soil vapor on-site is impacted by petroleum and chlorinated VOCs. The planned future use of the includes development of mixed use residential, commercial and light industrial uses.

Contact with contaminated soil or groundwater is unlikely unless people dig below the surface. Contaminated groundwater at the site is not used for drinking and the site is served by a public water supply that obtains water from a different source not affected by this contamination. Given that the site is currently vacant, soil vapor intrusion does not represent a current concern. I understand that a community air monitoring plan will be in place to address the potential for exposures during future remedial activities and that any redevelopment will be conducted in a manner that is protective of public health.

Based on the information provided to date and the lack of a complete exposure pathway to site-related contaminants, I do not believe this site represents a significant threat to public health. If you have any questions, or if you would like to discuss this site further, please contact me at (518) 402-7860.

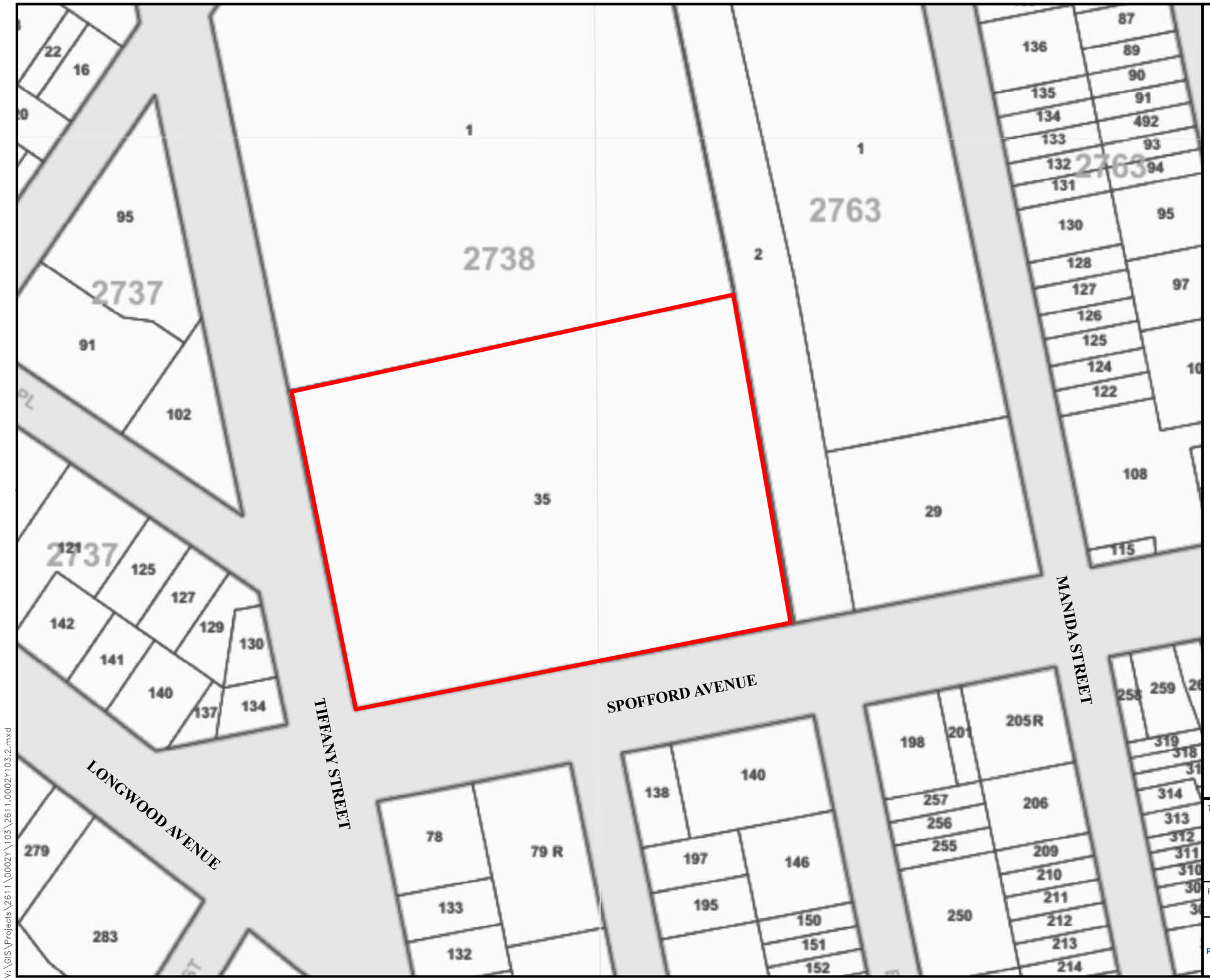
Sincerely,

Justin H. Deming, Chief
Regions 2, 4 & 8
Bureau of Environmental Exposure Investigation

ec: C. Vooris / M. Doroski / e-File
C. Westerman – NYSDOH MARO
C. D'Andrea – NYC DOHMH
J. O'Connell / W. Zheng – NYSDEC Region 2

APPENDIX B

Tax Map



LEGEND

SITE BOUNDARY

SOURCE

NEW YORK CITY DEPARTMENT OF FINANCE TAX MAP OFFICE

50 0 50 100 Feet

Title:

TAX MAP

1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For:

THE PENINSULA JV, LLC

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: J.P.G.	Date: 16JUN17
Prepared by: M.R.	Scale: AS SHOWN
Project Mgr: J.P.G.	Project: 2611.0002Y000
File: 2611.0002Y103.2.mxd	

FIGURE **2**

V:\GIS\Projects\2611\0002Y\103\2611.0002Y103.2.mxd

APPENDIX C

Site Health and Safety Plan

Site-Specific Health and Safety Plan

1221 Spofford Avenue
Tax Lots 35 of Tax Block 2738
Bronx, New York

September 17, 2018

Prepared for:

THE PENINSULA JV, LLC
111 8th Avenue
New York, New York 10011

Prepared by:

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

2611.0002Y.121/HASPCV

Table of Contents

Tables

Figures

Appendices

List Job Safety Analyses Forms which are required for the project and are included in Appendix A below:

1. Job Safety Analysis Form
2. Site Walk and Inspection
3. Mobilization and Demobilization
4. Excavation and Trenching
5. Soil Sampling
6. Backfilling Excavation and Compaction
7. Trucking

1. Introduction

This site-specific Health and Safety Plan (HASP) has been prepared in accordance with 29 CFR 1910.120 Occupational Safety and Health Act (OSHA) Hazardous Waste Operations and Roux Environmental Engineering and Geology, D.P.C. (Roux) Standard Operating Procedures (SOPs). It addresses all the activities described below that are associated with the property located at 1221 Spofford Avenue in the Borough of Bronx, City, and State of New York (the Site, Figure 1) and will be implemented by the designated Site Health and Safety Officer (SHSO) during Site work.

When activities are to be conducted, which are not specifically addressed by this HASP, appropriate SOPs and Job Safety Analyses (JSAs) will be reviewed to determine the appropriate work approach and associated levels of health and safety required. If a JSA for the specific activity does not exist, one will be prepared by the field work team, reviewed for completeness by the Project Manager, and implemented as required by the JSA (see Section 6.3 and Appendix A).

Compliance with this HASP is required for all Roux personnel and subcontractors contracted directly by Roux. Assistance in implementing this HASP can be obtained from the Roux Office Health and Safety Manager (OHSM). The content of this HASP may undergo revision based upon additional information made available. Any changes proposed to this HASP must be reviewed and approved by the OHSM or his/her designee [and the Client contact, if applicable].

All Site operations are under the direction of The Peninsula JV, LLC (Client) and any operations or activities covered under this safety plan, which are also addressed by the Client's procedures and protocols will be performed in compliance with their requirements. Specifically, routine operations or activities performed at the Site that commonly require adherence to Clients procedures and protocols include confined space entry, welding, other "hot work" operations, lock-out/tag-out and the use of personal protective equipment/clothing. These requirements were incorporated into Section 8.2 of this HASP and, at a minimum, include the use of high visibility clothing, hardhats, steel toe boots/shoes, work gloves, and safety glasses.

Prior to performing work each task should be evaluated to determine the appropriate procedures that need to be followed.

Responsibility	Name	Telephone Number
Roux Contacts		
Project Principal	Frank Cherena	631-232-2600
Project Manager	Jeffrey Wills	631-232-2600
Site Health and Safety Officer	TBD	
Client Contacts		
Client Contact	Arianna Sacks Rosenberg	

Scope of Work:

The scope of work will include the following:

- Oversight of the closure of two (2) 12,000-gallon Underground Storage Tanks (USTs);
- Oversight of excavations and backfill;
- Collection of post-excavation samples;
- Community Air Monitoring; and
- Collection of waste characterization samples.

Detailed scopes of work for these activities will be prepared prior to implementation of the tasks.

Emergency Information

Multiple emergency services may be obtained by calling 911. More specific numbers for local services are listed below but should not be used until after 911 is alerted.

Type	Name	Telephone Numbers
Police	NYPD	911
Fire	FDNY	911
Urgent Care Facility (map attached)	City MD	(212) 913-0820
Hospital (map attached)	Bronx Lebanon Hospital	(718) 860-6169

Environmental Emergency

(e.g., release or spill)

Type	Name	Telephone Numbers
Corporate Health and Safety Manager	Brian Hobbs	(631) 232-2600 (Office) (631) 807-0193 (Cell)
Office Health and Safety Manager	Levi Curnutte	(631) 232-2600 (Office) (727) 743-0304 (Cell)
Project Manager	Jeffrey Wills	(516) 637-0213 (Cell)
Project Principal	Frank Cherena	(631) 445-0357 (Cell)

2. Personnel Designations

Project Manager

The Project Manager (PM) is responsible for coordination of subcontractors and tasks related to accomplishment of the scope of work. The PM for this project is Mr. Jeffrey Wills.

Site Manager

The Site Manager (SM) is responsible for committing to a goal of ZERO environmental, health and safety incidents. The SM is also responsible for making certain that personnel receive and are aware of the provisions of this HASP, are instructed in the work practices necessary to ensure safety and are familiar with planned procedures for dealing with emergencies. The SM assures that personnel are aware of the potential hazards associated with site operations and correcting any work practices or conditions that may result in injury or exposure to hazardous substances. The SM ensures that at least one person on site, prior to assignment, is trained and certified by the American Red Cross or equivalent and is responsible for rendering first aid. These individuals will be identified by job function and will be recertified per the certifying agency's time schedule. Blood borne Pathogens training will be conducted concurrently and will be provided annually. Potential exposure to blood borne pathogens will be determined without regard for personal protective equipment. When rendering first aid or CPR universal precautions will be observed. Labels and signs will be used to serve as warnings of infectious materials. Employees will also have a copy of the site-specific exposure control plan. The use of PPE/PPC provides for work practice controls. This PPE/PPC will be provided at no cost to employees. Where PPE is provided to minimize exposure to lead, gloves, hats, vented goggles, shoes, or disposable shoe covers are provided. Protective clothing shall be in clean and dry condition at least weekly. Protective clothing shall be cleaned, laundered, properly disposed, and repaired or replaced as necessary. Any blood-soaked bandages, etc., will be placed in leak proof bags for handling, storage, and transport. After contact with blood or other potentially infectious material, all equipment and surfaces shall be cleaned and decontaminated. Hepatitis B vaccine is made available to all employees that have occupational exposure to BBP at no cost. The SM assures that all field personnel are in compliance with the hazardous waste worker health and safety training and medical surveillance requirements of 29 CFR 1910.120 and all other applicable regulations. The SM for this project is yet to be determined.

Corporate Health and Safety Manager

The Corporate Health and Safety Manager (CHSM) is responsible for assuring that the appropriate monitoring and safety equipment and other resources necessary to perform Site activities safely are addressed in the HASP. The CHSM provides consultation to Site personnel on all questions related to health and safety. The CHSM also provides HAZWOPER training based on his extensive industrial experience and technical background (i.e., CIH). The CHSM for Roux is Mr. Brian Hobbs.

Site Health and Safety Officer

The Site Health and Safety Officer (SHSO) will be present onsite during the conduct of all field operations, will be responsible for all health and safety activities, and has the authority to make all health and safety related decisions. The SHSO ensures that all personnel working onsite are qualified according to applicable Environmental Protection Agency, Occupational Safety and Health Association (OSHA) and state requirements. The determination of hazard concentrations will be made by the SHSO in consultation with the CHSM. The SHSO has stop-work authorization which he or she will execute upon determination of an imminent safety hazard, emergency situations, or other potentially dangerous situation, such as detrimental

weather conditions. Authorization to proceed with work will be issued by the SHSO or CHSM in consultation with the SM after such action. The SHSO or SM will initiate and execute all contact with emergency facilities and personnel when this action is appropriate. The SHSO will also monitor decontamination procedures to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies. The SHSO for this site is yet to be determined. An assistant SHSO may be designated by the SHSO if required but must be pre-qualified and approved by the CHSM.

Office Health and Safety Manager

The New York Office Health and Safety Manager (OHSM) is responsible for providing support, as needed, to the Project and serves as back-up to the Site Health and Safety Officer. The OHSM assures that field personnel assigned to the project receive a health and safety orientation and are provided with the necessary personal protective equipment and clothing. The OHSM may periodically perform field audits, participate in field assessments, and prepare information to be used for safety communication. The OHSM for this project is Mr. Levi Curnutte.

Project Personnel

Project personnel will be responsible for: complying with this HASP; taking all reasonable precautions to prevent injury to themselves and to their fellow employees; performing only those tasks that they believe they can do safely; immediately reporting any accidents and/or unsafe conditions to the SHSO; notifying the SM and the SHSO of any special medical problems (e.g., allergies) and making certain that all on-site personnel are aware of any such problems.

3. Site History and Physical Description

This section provides a brief summary of the history and physical description of the Site.

The Site is located in the Borough of Bronx, City and State of New York and is identified as Tax Lot 35, of Tax Block 2738 on the New York City Tax Map. Figure 1 is a Site Location Map and Figure 2 is a Site Plan. The Site is approximately 165,528-square feet (3.78 acres) and is bordered to the south by mixed use multi-family residential properties and commercial properties. The Corpus Christi Monastery is located to the north of the Site. Multi/single-family residential properties and commercial properties are located west of the Site. Single-family residential properties are located to the east of the Site.

The Site consists of the following buildings and improvements:

Block 2738

Asphalt paved parking, and recreation/playground spaces such as tennis and basketball courts. The former three to six-story building is currently being demolished.

4. Site-Related Incidents, Complaints and Actions

Historical evidence supporting the potential occurrence of releases exists in two forms, those supported by documentation, and those based on the knowledge of Client personnel. These incidents are presented below by geographical area with documented information first, then "knowledge" information procured from Client personnel. Locations of the tanks, buildings, and Site features mentioned in this HASP are shown on maps maintained in on-site files.

A Phase I Environmental Site Assessment completed in 2017 identified the following recognized environmental concerns (RECs):

1. Reported Spill Incidents: New York State Department of Conservation (NYSDEC) Spill Numbers 9610764, 9901578 and 0812579 were assigned the Site (specifically Lot 35). Spill #9610764 was assigned for a release of 40 gallons of #6 fuel oil due a faulty gauge; and was closed on the same day it was assigned. NYSDEC Spill #9901578 was assigned for discovery of contaminated soil during a subsurface investigation; and was closed on April 6, 2017. Spill # 0812579 was assigned for the release of approximately 2,000 gallons of #2 fuel oil from the underground storage tanks (USTs) located in the southeast courtyard of Lot 35. Several investigations have been performed confirming subsurface soil and groundwater impacts. Also, there is the potential for soil vapor migration and intrusion into the Site buildings, due to the extent of the release. A product recovery program consisting of monthly product recovery and quarterly groundwater monitoring was performed until approximately October 2016. However, no additional information regarding remedial activities since that time have been provided. Therefore, it is assumed separate phase petroleum product and extensive soil contamination still exists at the Site. The impacts to soil, groundwater and, potentially soil vapor, beneath the Site is considered a REC in relation to the Site.
2. Petroleum Use and Storage: Two 12,000-gallon #2 fuel oil USTs are registered as in-service at the site under NYSDEC Petroleum Bulk Storage (PBS) #2-604085; and are located in the in the southeast courtyard of Lot 35. In addition, one 5,000-gallon diesel aboveground storage tank (AST), located in a vault adjacent to the 12,000-gallon USTs, was utilized for a back-up generator was closed-in-place. The location of two additional tanks (one 20,000 gallon #6 fuel oil UST; and one 20,000-gallon AST were, reportedly, closed-in-place. However, the actual locations of these two tanks are not known. Petroleum use and storage at the Site, including the unknown locations of two tanks, is considered a REC in relation to the Site.
3. Staining: Staining observed on the concrete basement floor was presumably associated with oil spills and cleanup materials, and other universal wastes (such as batteries or degreasers, electrical equipment, and lubricating oils). Staining on the concrete basement floor; and is considered a REC in relation to the Site given the presence of floor drains and other penetrations in the concrete.
4. Surrounding Property Use: According to the resources utilized in this Phase I ESA, garages utilizing USTs as well as metal works/fabrication and automobile repair facilities were noted in the surrounding area of the Site. USTs have the potential to release petroleum products to the environment and metal works/fabrication and automobile repair facilities have the potential for using solvents and petroleum products. Therefore, these surrounding properties are, collectively, considered a REC in relation to the Site.

5. Hazard Assessment

The potential to encounter chemical hazards is dependent upon the work activity performed (intrusive versus non-intrusive) and the duration and location of the work activity. Such hazards could include inhalation and/or skin contact with chemicals/gases that could cause: dermatitis, skin burns, being overcome by vapors or asphyxiation.

Physical hazards that may be encountered during Site work include heat and cold stress, being crushed, head injuries, punctures, cuts, falls, electrocution, bruises and other physical hazards due to motor vehicle operation, equipment use and power tools.

Biological hazards may exist during Site activities. These hazards include exposure to insect bites/stings, animals and animal wastes, mold and bloodborne pathogens.

Prior to the beginning of each new phase of work, a job safety analysis (JSA) (Appendix A) will be prepared by the SSO with assistance from the OHSM. The analysis will address the hazards for each activity performed in the phase and will present the procedures and safeguards necessary to eliminate the hazards or reduce the risk. JSAs for each task will be reviewed with onsite personnel at each morning tailgate meeting and as tasks change throughout the day.

5.1 Chemical Hazards

The potential for personnel and subcontractors to come in contact with chemical hazards may occur during the following tasks:

- Temporary closure of the USTs;
- Excavation of soil for geotechnical test pits; and
- Waste characterization sampling.

For chronic and acute toxicity data, refer to Summary of Toxicological Data Sheets in Table 1 for further details on compound characteristics.

5.1.1 Carbon Monoxide Hazards

Carbon monoxide (CO) is a colorless, odorless, and toxic gas, which is predominately produced by incomplete combustion of carbon-containing materials. Incomplete combustion occurs when insufficient oxygen is used in the fuel (hydrocarbon) burning process. Common sources of CO may include: motor vehicle exhausts, fuel burning[1], furnaces, coal burning power plants, small gasoline engines including electric generators, demolition equipment, chain saws, lawn mowers and power washers, marine engines, fuel powered forklifts, propane or kerosene-powered heaters, and fuel burning water heaters.

Exposure to CO impedes the blood's ability to carry oxygen to body tissues and vital organs. When CO is inhaled, it combines with hemoglobin (an iron-protein component of red blood cells), producing carboxyhemoglobin, which greatly diminishes hemoglobin's oxygen-carrying capacity. **Hemoglobin's**

1 Fuel burning may include natural gas, propane, fuel oil, kerosene, gasoline, coal, or other carbon-based items.

binding affinity for CO is 300 times greater than its affinity for oxygen. As a result, small amounts of CO can dramatically reduce hemoglobin's ability to transport oxygen.

Common symptoms of CO exposure are headache, nausea, rapid breathing (i.e., shortness of breath), weakness, exhaustion, dizziness, and confusion (i.e., light headedness). Hypoxia (severe oxygen deficiency) due to acute CO poisoning may result in reversible neurological effects, or it may result in long-term (and possibly delayed) irreversible neurological (brain damage) or cardiological (heart damage) effects.

CO exposure can be dangerous during pregnancy for both the mother and the developing fetus. Please contact CDC-INFO (800-232-4636) if you have any questions regarding CO exposure during pregnancy.

At work sites where carbon-containing fuels are used, such as in internal combustion engines and generators, the exhausts from these units can contain significant concentrations of CO. In situations where the exhausts create exposure to CO, the exhausts of these units should be extended via appropriate hoses/piping to well ventilated exterior areas (i.e., outside and downwind of structures). Where the concentrations of CO exceed the following "action levels," notify the Project Manager and immediately implement the corresponding actions to mitigate exposure.

Action Levels Table (CO)

Carbon Monoxide (CO) Action Levels[2]	
Concentration of CO in air	**Action**
< 25 ppm	Inspect exhaust system for leaks or other sources of CO. Monitor initially and every 15 minutes during use of CO-generating equipment.
25 – 50 ppm	Ventilate area. Monitor continuously and record measurements. Contact PM.
> 50 ppm	Stop work activities. Ventilate area.

5.2 Physical Hazards

A variety of physical hazards may be present during Site activities. These hazards are similar to those associated with any construction-type project. These physical hazards are due to motor vehicle and heavy equipment operation and hazardous walking and working surfaces. In particular, when entering or exiting a bermed area surrounding a storage tank, use the stairways provided. Do not enter or exit the bermed area by walking on the bermed surface itself. A hard hat must be worn at all times while working at the base of the cliffs. Additionally, when performing activities at the Site, a hard hat and reflective vest must be worn at all times. Workers must also be aware of electrical hazards, such as overhead power lines, while performing their assigned tasks. These hazards are not unique and are generally familiar to most field personnel. These will be addressed in accordance with Roux's Lock, Tag, and Try Program. Additional task-specific requirements may be covered during safety briefings.

2 Based upon The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) of 25 ppm as an 8-hour time-weighted average (TWA) [ACGIH 2014 TLVs® and BEIs®] and OSHA's Permissible Exposure Limit (PEL) of 50 ppm as an 8-hour TWA concentration [29 CFR Table Z-1].

5.2.1 Flammability/Explosive Hazards

A variety of highly flammable/explosive materials may be stored at the Site. Prior to performing activities near potentially flammable/explosive materials (i.e., within storage tank bermed areas), all applicable sections of this HASP and any Client procedures specific to these areas need to be thoroughly understood and adhered to. Any questions or concerns should be directed to the SHSO or the Client's Project Engineer.

5.3 Biological Hazards

Biological hazards include exposure to poison ivy/oak, the possibility of disease carrying insects (i.e., ticks) and a variety of wild animals (i.e., coyotes, raccoons, etc.).

5.3.1 Insect Stings

Stings from insects are often painful, may cause swelling, and can be fatal if a severe allergic reaction, such as anaphylactic shock, occurs. If a sting occurs, the stinger should be scraped out of the skin, opposite of the sting direction. The area should be washed with soap and water, followed by an ice pack. Personnel allergic to bee and/or wasp stings shall alert their PM, SHSO and coworkers immediately, and provide/self-administer medicine and antidotes to treat allergic reactions immediately as prescribed by their personal physician, or if the victim has a history of allergic reaction, he/she should be taken to the designated hospital.

5.3.2 Tick Injury Prevention Program

Ticks may carry Lyme disease, Rocky Mountain spotted fever or other diseases. As such, Roux has instituted a program to prevent tick bites and to provide prompt, adequate and appropriate notifications and treatment in the event of a work-related tick bite. This SOP applies to all Roux employees and their subcontractors and is additionally addressed by applicable JSAs.

5.3.3 Project Planning

Pre-planning is the first step in tick avoidance. Where possible, plan the work to avoid tick-infested areas.

- Avoid brushy, overgrown grassy and wooded habitats, particularly in spring and early summer when nymphal-stage ticks feed.
- Remove leaves, tall grass and brush from areas surrounding work areas (to include residential Sites), thereby reducing tick, deer, and rodent habitat.
- Consider having a licensed applicator apply tick-toxic chemicals (e.g., Damminix, Dursban, Sevin, etc.) to surrounding work or residential areas to suppress the tick population.
- Consider performing work during dormant (sub-freezing) seasons; or not during maximum season (spring and early summer) unless it is not practical or rescheduling may introduce other hazards.

5.3.4 Tick Injury Prevention Measures

Where avoidance of tick habitat or clearing of the area is not possible, follow Roux' Tick Prevention SOP which includes the use of PPE and other measures to avoid tick bites. These include:

- Using Permethrin on clothes to kill ticks on contact;
- Wearing light-colored clothing so that ticks can be more easily seen and removed before attachment occurs;
- Wearing long-sleeved shirts and tucking in (or taping) pant legs into socks or boots to prevent ticks from reaching the skin;

- Wearing high boots or closed shoes that cover the entire foot;
- Wearing a hat; and
- Spraying insect repellents containing n,n-diethylm-toluamide (DEET) on exposed skin, excluding the face, in accordance with United States Environmental Protection Agency (USEPA) guidelines.

Tick prevention measures as described above must be implemented prior to entering a potentially tick-infested area. This usually means that the PPE needs to be in place and properly worn before stepping off of a paved or concrete area onto a grassy or wooded area. Pant legs need to be tucked into socks. Where Tyvek is used, the pant legs need to be taped at the ankles.

Insect repellent should be applied in accordance with the manufacturer's instructions. In the event of sensitive ecosystems ensure that the application does not need to be applied at a certain distance from the habitat.

The PPE needs to remain on with the tucking or taping of pant legs, all closures fastened, etc., until leaving the potentially tick-infested area. Upon leaving the area, remove the PPE and bag it to prevent ticks from traveling and subsequently attaching themselves to your skin.

Workers are to inspect themselves and co-workers frequently to see if any ticks are on their clothing and remove them as soon as they are identified. If an embedded tick is found, it should be promptly removed with tweezers. This should be done by grasping the tick firmly and as close to the skin as possible. Then, with a steady motion, pull the tick's body away from the skin. Cleanse the area with an antiseptic. DO NOT use petroleum jelly, a hot match, nail polish or other products to remove the tick. **Preserve the tick for analysis (i.e., by placing in a zip lock bag, envelope, or jar). The tick will be analyzed to determine if it contains the bacteria capable of causing Lyme disease.** After returning home, it is also important to do another thorough examination while showering as a further check that no ticks were missed in previous inspections. Also, it is recommended that any work clothes be washed and dried at high temperatures.

5.3.5 Responding to Known or Suspected Tick Bites

Any discovery of a tick embedded in the skin where the tick contact may have occurred at work will require (in addition to project management) immediate contact of the Office Manager, OHSM, and CHSM.

Medical practitioners consulted by Roux recommend not administering an antibiotic until AFTER symptoms such as rash, flu-like symptoms, fever, joint or muscle aches, nausea or vomiting develop which could take a few days. Therefore, for tick bites determined to be work related, **antibiotics should not be prescribed or administered until AFTER the results of the tick testing are reviewed and until after any characteristic symptoms develop.**

5.3.6 Tick Incident Investigation and Reporting

Investigation and reporting of a work-related tick bite will follow established incident investigation and reporting procedures. The Roux Health and Safety Lessons Learned (H&SLL) / Accident Report Forms (ARF) will be used for documenting incidents as appropriate, and are provided in Appendix C.

5.3.7 Animals and Animal Wastes

There is potential for various wildlife to reside within the structures, including, but not limited to pigeons, bats, mice, rats, squirrels, raccoons, stray dogs, and feral cats. Certain animals can represent significant sources

(vectors) of disease transmission. Precautions to avoid or minimize potential contact with (biting) animals (such as some of the above listed) or animal waste and/or dead animals should be considered prior to all field activities. Rats, squirrels, raccoons, feral cats, and other wild animals can inflict painful bites which can also cause disease (as in the case of rabid animals). Site personnel should avoid contact with any of the above.

If contact occurs, be sure to clean the area thoroughly with soap and water as soon as possible. If a bite occurs, the area should be cleaned thoroughly immediately with soap and water and medical attention should be sought.

5.3.8 Blood-Borne Pathogens

The majority of the occupational tasks on-Site will not involve a significant risk of exposure to blood, blood components, or body fluids. The highest risk of acquiring any blood borne pathogen for employees on-Site will be following an injury. When administering first aid care, there are potential hazards associated with blood borne pathogens that cause diseases such as Human Immunodeficiency Virus (HIV), Hepatitis B (HBV), Hepatitis A (HAV), Hepatitis C (HCV), or the Herpes Simplex Virus (HSV). An employee who has not received the appropriate certification and blood borne pathogens training should never perform first aid and/or cardiopulmonary resuscitation (CPR).

In order to minimize any potential pathogen exposure, all employees should use the hand washing facilities on a regular basis. The decontamination area will provide an adequate supply of water, soap, and single use towels for hand washing. Additionally, the following universal precautions should be followed to prevent further potential risk:

- Direct skin or mucous membrane contact with blood should be avoided.
- Open skin cuts or sores should be covered to prevent contamination from infectious agents.
- Body parts should be washed immediately after contact with blood or body fluids that might contain blood, even when gloves or other barriers have been used.
- Gloves and disposable materials used to clean spilled blood shall be properly disposed of in an approved hazardous waste container.
- First aid responders shall wear latex or thin mil nitrile gloves when performing any procedure risking contact with blood or body substances.
- Safety glasses will be worn to protect the eyes from splashing or aerosolization of body fluids.
- A CPR mask will be worn when performing CPR to avoid mouth-to-mouth contact.
- Cut-resistant work gloves will be worn to minimize the risk of injury to the hands and finger when working on all equipment with sharp or rough edges.
- Broken glass or possible contaminated material shall be avoided with unprotected hands.

5.3.9 Mold

A collection of moisture inside on-Site structures may lead to the growth of mold within the structures.

Although mold affects individuals differently and to different degrees, the following are some of the most common adverse health effects:

- Respiratory problems – wheezing, difficulty breathing;
- Nasal and sinus congestion;

- Eyes – burning, watery, reddened, blurry vision, light sensitivity;
- Dry, hacking cough;
- Sore throat;
- Nose and throat irritation;
- Shortness of breath and lung disease;
- Chronic fatigue;
- Skin irritation;
- Central nervous system (headaches, loss of memory, and mood changes);
- Aches and pains;
- Fever;
- Headaches;
- Diarrhea; and
- Immune suppression.

Decisions about removing individuals from an affected area must be based on the results of a medical evaluation, and be made on a case-by-case basis.

Workers that discover the visible presence of mold in excess of ten square feet need to notify the SHSO for consultation. If a worker smells mold and feels that he/she is experiencing symptoms of exposure, he/she should retreat and report the symptoms to the SHSO.

5.3.10 Other Biohazards

Other biological hazards include mosquitoes which generally live in the vicinity of brush, trees, and stagnant water. Some areas have mosquitoes that carry viruses (for example, West Nile virus, or Eastern Equine Encephalitis). Another category of biohazards includes plants such poison ivy, poison oak, and poison sumac. If exposed to these plants, personnel will wash skin thoroughly with soap and water or post-contact cleansers.

5.4 Heat/Cold Stress

Heat and cold stress are potential hazards associated with heavy physical activity and/or the use of personal protective equipment in hot or cold weather environments. Heat and Cold stress are discussed in Sections 9.13 and 9.14. Protection against sun exposure by wearing a sun screen, hat, and long-sleeved shirts must be implemented when warranted in addition to frequent and proactive hydration of workers.

5.5 Noise

Noise is associated with the operation of heavy equipment, power tools, pumps, and generators. Personnel with 8-hour time weighted average (TWA) exposures exceeding 85 decibels (dB) must be included in a hearing conservation program in accordance with 29 CFR 1910.95. High noise operations will be evaluated by the SHSO. Noise exposure will be controlled through the use of hearing protection such as ear plugs or ear muffs or by maintaining set-backs from high-noise equipment as warranted.

5.6 Hazards Caused by Roux's Work

Roux will advise the Client of any unique hazards presented by its work or of any hazards found by Roux during the course of its work for the Client.

- Heavy equipment and motor vehicle traffic- Workers shall wear fluorescent, reflective Class 3 vests or high visibility outerwear in high traffic areas and utilize traffic cones, barricades, and caution tape to protect work areas, as necessary;
- Slip, trip, fall hazards associated with uneven terrain, obstacles, and slippery or icy surfaces- General housekeeping will be performed to reduce slip, trip and fall hazards;
- Sharp edges, broken glass, exposed nails, rusty metal (wear leather or ANSI Level 2 cut-resistant gloves);
- Pinch points (wear leather or ANSI Level 2 cut-resistant gloves);
- Overhead hazards (wear hard hats as applicable); and
- Flying objects and airborne particulate hazards (Wear safety glasses, goggles, or face shields when appropriate).

5.7 Electrical Hazards

Portable pumps, generators, and other power tools require proper grounding and/or a ground fault circuit interrupter (GFCI) before operation. Personnel should never attempt to move an operating pump or generator.

6. Training Requirements

6.1 Basic Training

All 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 onsite per OSHA (29 CFR 1920.120(e)). Initial and annual training will include the locations of and proper use of safety equipment such as portable fire extinguishers. American Red Cross basic first aid and adult CPR will be offered to employees approximately every two years. Training records will be maintained by the SHSO onsite and as described in Section 6.4. OSHA HAZWOPER training will be provided annually and is limited to first responder awareness level only. Where training is required by a specific health or safety standard, this will be conducted initially and annually and will include the information summarized in the Toxicological Table, Table 1 of this HASP.

6.2 Site-Specific Training

Training will be provided by the SHSO and SM that specifically addresses the activities, procedures, monitoring and equipment to be utilized by site personnel and visitors. The training will include site and facility layout, hazards, emergency services at the site, and will detail all provisions contained within this HASP. Site-specific training will be documented and kept as part of the project records.

6.3 Safety Briefings

Project personnel will be given briefings by the SHSO, the PM and/or the Client's Project Engineer on an as-needed basis to further assist them in conducting their activities safely. Safety briefings will be provided each morning and when new operations are to be conducted; changes in work practices must be implemented due to new information made available and before work is begun at each onsite work area. Safety briefings will include a discussion of anticipated hazards, review Job Safety Analyses for tasks to be implemented, pertinent Loss, Lessons Learned, Peer Observation finding, and safety violations. These include not following Client rules or procedures, not following established safe work practices, and lack or improper use of personal protective equipment/clothing, etc. On-site safety briefings will be documented daily on the forms included as Appendix D (Health and Safety Briefing/Meeting Log and Daily Site Safety Checklist), and will be kept by the SHSO as part of the project records. In addition, when activities are to be conducted which are not specifically addressed by this HASP, appropriate JSAs will be reviewed to determine the appropriate levels of health and safety required. If a JSA for the specific activity does not exist, one will be prepared by the field work team, reviewed for completeness by the Project Manager, and implemented as required by the work scope. Copies of the completed JSA forms for various tasks are included in Appendix A. Modifications to JSAs will be documented on these forms and maintained in the project file. Observed safety violations will be addressed by coaching and mentoring of personnel.

6.4 Record Keeping Requirements

All record keeping requirements mandated by OSHA (29 CFR 1910.120) will be strictly followed. Specifically, all current personnel training records, medical fit for duty papers, and respirator fit test forms will be required before work can begin and maintained onsite during the length of the project. These records along with injury/incident reports, medical examination records and exposure monitoring records will become a permanent part of the project records. Each subcontractor will maintain the above-mentioned records for his employees.

Medical and exposure records maintained per 29 CFR 1910.1020 will be maintained for at least the duration of employment plus 30 years. Training records will be maintained for 3 years from the date of training.

Medical and exposure records shall be made available upon request to employees, and to the Assistant Secretary or the Director (OSHA) for examination and copying. Medical records must have written consent of employee before being released. Transfer of records will be in compliance with 29 CFR 1910.1020 (h).

7. Zones, Protection, and Communications

7.1 Site Zones

A three-zone approach to site operations to control the potential spread of contamination will be employed. The three zones are:

- The Exclusion Zone;
- The Contamination Reduction Zone; and
- The Support Zone.

The establishment of work zones will ensure that: personnel are properly protected against the potential hazards in the area where they are working; work activities and potential contamination are limited to the specific areas; and personnel can be easily located and evacuated in an emergency.

The establishment of work zones and the levels of protection required within the zones will be determined on a case-by-case basis. The SHSO, PM and the Client's Project Engineer will determine the need for work zones, and based upon Site-specific knowledge and data, determine the levels of protection within the established zones. The following sections provide general specifications for the three work zones.

7.1.1 Exclusion Zone

The area(s) which contain, or are suspected to contain, hazardous materials or activities will be considered the Exclusion Zone (EZ). The SHSO may establish more than one restricted area within the EZ when different levels of protection may be employed or different hazards exist. Signs will be posted in and around areas required to be posted by a specific health or safety standard. No personnel are allowed in the EZ without:

- The proper personal protective equipment;
- Medical authorization per Section 8.4;
- A need to be in the zone; and
- Training certification.

During excavation, drilling and sampling activities, the Exclusion Zone is defined as the excavation and a 10-foot radius around the excavation boundary, or drilling or sampling locations. For the purposes of this project, the Exclusion Zone(s) will be delineated once the work sites have been determined.

7.1.2 Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) will be established between the Exclusion Zone and the Support Zone. The CRZ will contain the contamination reduction corridor (CRC) and is designed to reduce the probability that the uncontaminated clean areas will become contaminated or affected by other site hazards. It is the area where decontamination of personnel and equipment takes place and serves to limit the physical transfer of hazardous substances into clean areas. Decontamination shall be performed in geographical areas that minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment. The CRZ is to be used for general site entry and egress including access for heavy equipment for investigation activities. The CRZ will also contain safety and emergency equipment (see Section 7.2.3). No personnel are allowed in the CRZ without:

- The proper personal protective equipment;
- Medical authorization per Section 8.4;
- A need to be in the zone; and
- Training certification.

7.1.3 Support Zone

The Support Zone (SZ) is considered the uncontaminated area and will be separated from the CRZ by the "Contamination Control Line". The SZ will contain the support facility that will provide for team communications and emergency response. Appropriate sanitary facilities and safety and support equipment will be located in this zone. The majority of site operations as well as site access of authorized persons will be controlled from this location. The support facility will be located up-wind of site operations, if possible, and may be used as a potential evacuation point. No potentially contaminated personnel or materials are allowed in this zone.

7.1.4 Buddy System

Select field activities conducted in contaminated, hazardous, and remote areas of the Site may require the use of the buddy system. Instances when the buddy system should be employed include, but are not limited to activities performed in wetland areas (i.e., surface-water sampling, etc.), excavation activities, drilling activities and confined space entry (permit required and non-permit required). Prior to commencing with field tasks in a potentially hazardous area, the need for using the buddy system should be evaluated. If required, a buddy should be able to:

- Provide his/her partner with assistance;
- Observe his/her partner for signs of chemical or heat/cold exposure;
- Periodically check the integrity of his/her partner's protective clothing; and
- Notify the SHSO or others if emergency help is needed.

7.2 Personal Protection

This section describes the levels of protection that will be required by on-site personnel during Site activities.

7.2.1 General

The level of protection to be worn by field personnel and visitors will be defined and controlled by the SHSO, the PM and the Client's Project Engineer. Where more than one hazard is indicated, further definition shall be provided by review of Site hazards, conditions, and operational requirements and by monitoring at the particular operation being conducted.

Intrusive activities (i.e., drilling, excavation activities, etc.) include any Site activity which will, or potentially will, result in exposure(s) to hazardous or toxic chemicals or physical agents at or above the permissible exposure limit (PEL), or to flammable or oxygen-deficient atmospheres. Prior to commencing with any field activity, the potential for such conditions should be evaluated to determine air monitoring requirements. General procedures for air monitoring are described below.

During intrusive activities, continuous monitoring will be performed using the photoionization detector (PID). If personal monitoring is needed, it will only be undertaken under the direction and direct supervision of the CHSM.

Based upon the results of air measurements of intrusive activities in these worst case areas, the level of personnel protection will be established for the remainder of the Site. Protection may be upgraded or downgraded by the SHSO in conjunction with the PM based upon the PID instrument.

All non-intrusive activities that preclude contact with contaminated media will be performed in Level D protection without continuous monitoring, unless periodic PID monitoring indicates additional monitoring is warranted. However, initial monitoring may be necessary utilizing the PID.

7.2.2 Respiratory Protection and Clothing

Three levels of protective equipment are discussed below including Level D, Level C, and Level B.

Level D Protection

1. Personal Protective Equipment:
    - High visibility/reflective coveralls/clothing;
    - Cut Resistant gloves (or leather work gloves);
    - Boots/shoes, leather, or chemical-resistant, steel toe and shank;
    - Ice cleats(1);
    - Boots (outer), chemical-resistant (disposable)*;
    - Chemical resistant gloves – nitriles*;
    - Chemical resistant clothing (e.g., Tyveks)*;
    - Fire Retardant Clothing(2)*;
    - Safety glasses or chemical splash goggles(3);
    - Hard hat; and
    - Hearing protection.

    * Optional for activities except when handling petroleum product (i.e., well bailing) and materials (i.e., soil, sorbent products, etc.) exhibiting high degrees of petroleum contamination.

    (1) Ice Cleats to be worn with approved safety shoes when working in areas with snow/ice cover.

    (2) Fire retardant coveralls required in areas of hot work/areas with potential for flash (i.e., truck flammable loading rack, within tank berms).

    (3) Clear lenses to be worn when working in low light areas inside site buildings and outside during overcast days that may limit visibility.

2. Criteria for Selection.
    - Non-intrusive activities and intrusive activities in areas where the potential airborne hazards are substantially characterized and do not pose a threat of exposure in excess of one-half the PEL.
    - PID instrument (such as the MiniRAE 3000 or other comparable instrument) readings in the breathing zone are less than 5 ppm. Work functions preclude splashes, immersion, or potential for unexpected inhalation of any chemicals.

3. Modifications of Level D will be used to increase or decrease the level of skin protection during activities that increase or preclude, respectively, the degree of contact with chemical hazards. Modifications for increased protection may include the use of chemical resistant coveralls (e.g., Tyveks) and chemical resistant gloves. Chemical resistant coveralls, gloves, and boots will be used when the handling of petroleum products is required (i.e., well bailing). Any modifications of Level D will require approval of the SHSO and PM.

Protection may be upgraded or downgraded by the SHSO in conjunction with the Project Principal on the basis of action levels presented below:

Action Levels for Respiratory Protection (Total Organic Vapors)

Total Organic Vapors in Breathing Zone (ppm)[(1)]	Action
≤ 5	No Action
> 5 – < 25	Cease Field Operations
≥ 25	Cease Field Operations

[(1)] Based on relative response (sensitivity of PID to total organic vapors).

PID Action Levels

If photoionization detector measurements are above 5 ppm-v but below 25 ppm-v above background for five minutes in the breathing zone, employee protection will be upgraded to Level C with the use of a full-face respirator.

If PID measurements exceed 25 ppm-v above background for five minutes in the breathing zone, work activities will cease until airborne vapor levels can be reduced to less than 25 ppm-v and are quantified or the SHSO determines alternate methods to be followed in order to proceed.

Most activities are conducted outdoors, where breathing of high vapor levels are not likely in aboveground areas. Excavations which are not to be entered are likely to have higher vapor concentrations. Where a spill occurs in a basement or other indoor area, ventilation will not be as good as outdoors and extra care shall be taken in monitoring vapor levels.

Action Levels for Oxygen Levels and Combustible Gases

COMBUSTIBLE GASES [1]	
0-2.0 – 2.0% LEL	Continue monitoring
2.0 – 5.0% LEL	Notify SHSO
5.0% LEL or greater	Potential explosion hazard Interrupt task / Evacuate Area
OXYGEN [1]	
20.8% O_2	Oxygen level normal
Greater than 22.0% O_2 / Less than 20.0% O_2	Oxygen enriched / deficient – notify SHSO
Greater than 23.5% O_2 / Less than 19.5% O_2	Oxygen enriched / deficient Interrupt task / Evacuate area

[1] Action levels are based on Environmental Protection Agency Standard Operating Safety Guides; Table 5-1, Atmospheric Hazard Action Guidelines may be further restricted based on the CIH's professional judgment and experience.

Level C Protection

1. Personal Protective Equipment:

   - Full-face, air-purifying, cartridge-equipped respirator (MSHA/NIOSH specifically approved for protection from organic vapors per OSHA 1910.1028);
   - Chemical-resistant clothing (coverall; hooded, two-piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls);
   - Gloves (outer), chemical-resistant - nitriles;
   - Gloves (inner), chemical-resistant - latex;
   - Boots (inner), chemical-resistant, steel toe and shank;
   - Boots (outer), chemical-resistant (disposable*);
   - Hard hat;
   - Hearing protection; and
   - Escape mask*.

   * Optional

2. Criteria for Selection.

   Meeting any of these criteria warrants use of Level C protection.

   - Airborne hazards are known to be present but are unlikely to exceed protection factors provided by air-purifying respirators.
   - Continuous total organic vapor readings in the breathing zone register between 5 ppm and 25 ppm on a PID (such as the MiniRAE 3000 or other comparable instrument), benzene and furfural readings utilizing colorimetric indicator tubes (e.g., Dräeger or Sensidyne) are detectable but less than 5 ppm.
   - Measured air concentrations of known organic vapors will be reduced by the respirator to, at, or below one-half the permissible exposure limits, and the individual and combined compound concentrations are within the service limit of the respirator cartridge.
   - Atmospheric contaminant concentrations do not exceed Immediately Dangerous to Life and Health (IDLH) concentrations.
   - Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect the small area of skin left unprotected by chemical-resistant clothing.
   - Job functions have been determined not to require self-contained breathing apparatus.

   Notes: 1. Benzene and furfural may also be monitored initially and periodically in the breathing zone utilizing activated charcoal sampling devices.

   2. Modifications of Level C will be used to increase or decrease the level of skin protection during activities that increase or preclude, respectively, the degree of contact with chemical hazards. Modifications for increased protection may include the use of chemical resistant coveralls (e.g., Tyveks) and chemical resistant gloves. Any modifications to Level C will require approval of the SHSO and PM.

Level B Protection

1. Personal Protection Equipment:

   - Pressure-demand, self-contained breathing apparatus (MSHA/NIOSH approved);
   - Chemical-resistant clothing (overall and long-sleeved jacket; coveralls; hooded, one or two-piece chemical-splash suit; disposable chemical-resistant coveralls);

- Gloves (outer), chemical-resistant;
- Gloves (inner), chemical-resistant;
- Boots (inner), chemical-resistant, steel toe and shank;
- Boots (outer), chemical-resistant, (disposable);
- Hard hat;
- Hearing protection; and
- Two-way radio communications (intrinsically safe).

2. Criteria for Selection

   Meeting any one of these criteria warrants use of Level B protection:

   – PID instrument (such as the MiniRAE 3000 or other comparable instrument) readings in the breathing zone are greater than 25 ppm and less than 500 ppm, benzene and furfural are detectable at concentrations at or above 5 ppm utilizing colorimetric indicator tubes (e.g., Dräeger or Sensidyne).

   – Airborne hazards are known to be present, but are not identified or quantified.

   – The type(s) and atmospheric concentration(s) of toxic substance(s) have been identified and require the highest level of respiratory protection, but a lower level of skin and eye protection. These would be atmospheres:

     ♦ With IDLH concentrations;

     ♦ Exceeding limits of protection afforded by a full-face, air-purifying respirator; or

     ♦ Containing substances requiring air-supplied equipment, but substances and/or concentrations do not represent a serious skin hazard.

   – The atmosphere contains less than 19.5% oxygen.

   – Site operations make it highly unlikely that the small, unprotected arc of the head or neck will be contacted by splashes of extremely hazardous substances.

   – If work is performed in an enclosed space where the exposure to toxics or an oxygen deficient atmosphere may be present.

7.2.3 Safety Equipment

Basic emergency and first aid equipment will be available at the Support Zone and/or the CRZ as appropriate. This shall include first aid kit, emergency eyewash, fire extinguishers, and other safety-related equipment. Basic emergency and first aid equipment is available onsite. Field personnel will be notified of the locations of emergency and first aid equipment prior to commencing with field activities.

Hand Tools

Where hand and power tools are used and employees are potentially exposed to the hazard of falling, flying, abrasive, or splashing objects, or are exposed to harmful dust, fumes, mists, vapors, or gases, the employees shall be provided the appropriate Personal Protective Equipment as necessary to protect them from the hazard.

Communications

Mobile Telephones – for communication with emergency support services/facilities. All Roux site personnel will be equipped with a mobile phone. Mobile communications, however, will be prohibited when the user is within the work area to avoid injuries resulting from distraction.

8. Monitoring Procedures for Site Operations

8.1 Air Quality Monitoring During Site Operations

The SHSO will monitor wind direction and temperature during monitoring and record all data in a log book. All monitoring equipment will be calibrated to the manufacturer's specifications each day prior to use and documented in Site field books.

8.2 Air Quality Monitoring During Intrusive Activities

Intrusive activities include any Site activity which will, or will possibly, result in exposure(s) to hazardous or toxic chemicals or physical agents at or above a permissible exposure limit (PEL), or to flammable or oxygen-deficient atmospheres. Prior to commencing with any field activity, the potential for such conditions should be evaluated to determine air monitoring requirements. General procedures for air monitoring are described below.

Air monitoring will be performed to establish the concentrations of volatile organic compounds during invasive activities using the following instrument(s):

- Photoionization detector;
- Colorimetric indicator tubes (e.g., Dräeger or Sensidyne), if necessary; and
- Activated charcoal sampling devices, if necessary.

The PID will be used to provide direct readings of organic vapor concentrations during intrusive activities to determine that personnel protection is adequate.

A combustible gas LEL/O_2 meter will be used to monitor the potential for oxygen-deficient atmospheres and for explosive concentrations of organic vapors during intrusive operations and any potential confined space work. Monitoring will be performed according to the action levels for oxygen and combustible gases provided in Section 7.2.2.

In accordance with the DER-10 Technical Guidance for Site Investigation and Remediation dated May 2010 (DER-10) issued by the New York State Department of Environmental Conservation (NYSDEC), a community air monitoring plan (CAMP) will be implemented during intrusive Site activities. The site-specific CAMP in accordance with DER-10, Appendix 1A, is included in Appendix I of this HASP.

8.2.1 Level D Intrusive Activities

Level D intrusive activities will initially include all intrusive Site activities. These investigations/activities will begin utilizing Level D protection as described in Section 7.2.2, with upgrading as necessary to assure adequate personnel protection.

The SHSO will monitor the breathing zone with the PID in continuous operating mode and with the alarm activated. The alarm will be set at 5 ppm, which is below the permissible exposure level (PEL) for all constituents of concern, except benzene and furfural. If the PID indicates the 5-ppm concentration has been exceeded, the SHSO will order cessation of the activity and the exclusion zone cleared of all personnel until the PID indicates a reading less than 5 ppm, or until the nature of the hazard has been more thoroughly evaluated.

8.2.2 Level C Intrusive Activities

Level C intrusive activities will initially include only those activities which require upgrading from Level D. Level C protection will be as described in Section 7.2.2, with upgrading, as necessary, to Level B to assure adequate personnel protection. Downgrading to Level D protection will also be possible if monitoring demonstrates no inhalation hazard exists for the activity.

The SHSO will monitor the breathing zone with the PID in continuous operating mode and with the alarm activated. The alarm will be set at 5 ppm, which is below the permissible exposure level (PEL) for all constituents of concern except benzene and furfural. If the PID indicates the 5-ppm concentration has been exceeded, the SHSO will initiate measurements utilizing the colorimetric indicator tubes for benzene and furfural.

If the PID readings exceed 25 ppm total organic vapor, or the benzene and/or furfural colorimetric indicator tube readings exceed 5 ppm, the SHSO will order cessation of the activity until: 1) the PID indicates a reading less than 25 ppm, and the benzene and/or furfural concentrations are below 5 ppm based upon the colorimetric indicator tube readings, 2) all potentially exposed personnel have donned Level B respiratory protection or, 3) the nature of the hazard has been more thoroughly evaluated and it is determined that the measured concentrations do not pose a potential exposure in excess of the PEL utilizing the Level C protection.

To confirm the adequacy of respiratory protection, personnel monitoring utilizing activated charcoal sampling devices may be performed to measure the airborne concentrations of benzene and furfural and possibly other organic compounds (as necessary) at the beginning of new activities and periodically during intrusive activities. These samples would be sent to an AIHA accredited laboratory for analysis using the approved NIOSH analytical methods.

8.2.3 Level B Intrusive Activities

Level B intrusive activities will initially include only those activities that require upgrading from Level C, and only those activities required to bring work to a safe stoppage. No work is currently planned utilizing Level B protection, and this HASP will require amendment at such time as Level B work becomes necessary (except for safe work stoppage activities).

When Level B protection is utilized, the SHSO will monitor the breathing zone with the PID in continuous operating mode and with the alarm activated. The alarm will be set at 100 ppm. If the PID indicates the 100-ppm concentration is exceeded, the SHSO will order cessation of the activity until: 1) the PID readings are below 100 ppm or; 2) until the nature of the hazard has been more thoroughly evaluated and it is determined that the measured concentrations do not pose a potential exposure in excess of a PEL utilizing the Level B protection.

To confirm the adequacy of respiratory protection, personnel monitoring utilizing activated charcoal sampling devices may be performed to measure the airborne concentrations of benzene and furfural and possibly other organic compounds (as necessary) whenever Level B protection is utilized.

8.3 Air Quality Monitoring During Non-Intrusive Activities

Non-intrusive activities include any Site activity which would not reasonably be expected to result in exposure(s) to hazardous or toxic chemicals or physical agents at or above the permissible exposure limit

(PEL), or to flammable or oxygen-deficient atmospheres. Based upon the current understanding of Site conditions no monitoring is required during non-intrusive activities.

8.4 Medical Surveillance Requirements

Medical surveillance specifies any special medical monitoring and examination requirements as well as stipulates that all Roux personnel and subcontractors contracted directly by Roux are required to pass the medical surveillance examination or equivalent for hazardous waste work required by 29 CFR 1910.120.

The examination will be taken annually, at a minimum, and upon termination of employment with the company at no cost to employees. Additional medical testing may be required by the CHSM, or CHSM in consultation with the company physician and the SHSO, if an overt exposure or accident occurs, or if other site conditions warrant further medical surveillance.

Medical examinations and procedures shall be performed by or under the supervision of a licensed physician. Medical surveillance is provided without cost to the employees.

9. Safety Considerations for Site Operations

9.1 General

In this section, non-monitoring, safety-related procedures are described. In general, all site activities should be conducted in accordance with the Client's Safe Work Practices Requirements and Contractor Safety Rules and Work Procedures.

9.2 Site Walk-Throughs

Safety considerations during site walk-throughs are important since this activity will usually precede all other field operations. Air monitoring will be performed as indicated in Section 8.0 and will be used to assist in prescribing levels of protection for future site operations, designating site layout and identifying areas of particular hazard, if any.

9.3 Construction Activities

Activities involved with construction of remedial action treatment systems will initially be considered non-intrusive activities. However, initial and/or periodic monitoring, as described in Section 7.2 may be performed by the SHSO.

A variety of physical hazards may be present during any construction-type project. Personnel should be aware of safety issues associated with; noise, cold, hot work such as welding, cutting and burning, heavy lifting, rough terrain, heavy equipment operation, ladders, scaffolding, excavating and trenching, underground and overhead utilities, electrical hazards, and the hazards associated with hand and power tools. These hazards are not unique and are generally familiar to most construction personnel.

9.4 Heavy Equipment and Traffic Safety

The SHSO will be present onsite during all invasive operations and will provide health and safety monitoring to ensure that appropriate levels of protection and safety procedures are utilized.

This Site utilizes all of the mechanical equipment used on any major construction site. Typical machinery to be found includes pumps, compressors, generators, portable lighting systems, pneumatic tools (drum openers), hydraulic drum crushers, pug mills, forklifts, trucks, dozers, and backhoes, drill rigs. It poses a serious hazard if not operated properly, or if personnel near machinery cannot be seen by equipment operators.

Roux SOP 1.13R1 outlines Roux policies and procedures regarding Heavy Equipment Exclusion Zone (HEEZ) set up and use. The objective of the Exclusion Zone Policy 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 other equipment entering the HEEZ while the equipment is in operation/moving, to ensure that Roux and Subcontractor employees are not unnecessarily exposed to the hazards of the equipment. Appendix E provides Roux' Heavy Equipment Exclusion Zone SOP.

In addition, safety procedures relating to traffic safety must be followed while performing on-site and off-site activities.

On-Site Traffic Safety Procedures

When performing activities on, or adjacent to on-site roads, the following traffic safety procedures must be followed.

- High-visibility coveralls must be worn during Site activities as described in Section 7.2 of this HASP. If possible, the coveralls being worn should be modified via wearing of a reflective vest or with a reflective, reflective stripe(s) when working on, or adjacent to all paved and unpaved roads at the Site.
- When performing activities on, or on the shoulder of any paved roads (e.g., Site entrance and exit roads, the primary roads leading to a truck loading rack, paved areas at a truck loading rack), a minimum of two people must be present. One person will serve as a "traffic watchman" whose sole responsibility is to monitor traffic conditions and alert worker(s) of potential traffic hazards. The "traffic watchman" must be alert at all times and focused on traffic conditions. At no time should the "traffic watchman" engage in activities other than monitoring traffic conditions.
- When performing activities at wells, well vaults, manholes, etc., on, or adjacent to all paved and unpaved roads at the Site, the work vehicle should be positioned, to the fullest extent possible, to form a barrier between the worker(s) and oncoming traffic. In addition, each work vehicle will be equipped with a minimum of four high visibility traffic cones. All traffic cones will be placed as necessary to alert traffic of ongoing activities.
- All Client and Roux subcontractors performing work at the Site must also adhere to the above safety procedures.

Off-Site Traffic Safety Procedures

When performing activities on or adjacent to off-site roads, the following traffic safety procedures must be followed.

- When performing activities on, or adjacent to off-site roads (paved and unpaved), a reflective vest or high visibility outerwear will be worn at all times.
- As described in on-site procedures, when performing activities on, or adjacent to off-site paved roads, a "traffic watchman" must be used at all times.
- As described in on-site procedures, when performing activities on, or adjacent to off-site roads, the work vehicle should be positioned, to the fullest extent possible, to form a barrier between the worker(s) and oncoming traffic. In addition, a minimum of four 42" high traffic cones will be placed as necessary to alert traffic of ongoing activities.

9.4.1 Inspection

Each piece of potentially hazardous equipment (i.e., power tools) will be inspected for proper and safe operation prior to its use.

- All mechanical and rigging equipment will be inspected by the operators prior to beginning this work effort, and at least daily thereafter, to ensure proper operating capability and that all guards are adequate and in place. Defective equipment must be repaired or replaced prior to continued use/operation.
- Inspect all cables, sheaves, slings, chains, hooks, and eyes prior to use.
- Secure equipment firmly or make sure it is supported.
- Be sure all power lines are inactivated, removed, or at a safe distance.
- Always use proper loading for capacity at lifting radius.
- Keep all equipment lubricated and maintained.

- Employ signal persons whenever needed.
- Make certain that signals are understood and observed.

9.5 Drilling Operations

The SHSO will be present onsite during all Roux contracted, and when requested, Client contracted, drilling operations. The SHSO will provide health and safety monitoring to ensure that appropriate levels of protection and safety procedures are utilized. The proximity of chemical, water, sewer, and electrical lines will be identified by the Client's Project Engineer before any subsurface activity or sampling is attempted. Refer to Appendix F for the Roux' Subsurface Utility Clearance Procedure, which provides guidance regarding the identification of subsurface structures through exploratory test-hole advancement to target depths in order to be protective of underground utilities potentially in the borehole location and the health and safety of both onsite personnel and the public.

Proper stockpiling, containment, and disposal practices will be utilized in regard to the potential amount of waste generated during operations. The location of safety equipment and evacuation procedures will be established prior to initiation of operations according to this HASP. The use of hard hats, eye protection, ear protection, hand protection, and steel-toed boots will be required during all drilling operations.

9.6 Excavation and Backfill Operations

The SHSO will be present onsite during all Roux contracted excavation and backfill operations and will provide health and safety monitoring to ensure that appropriate levels of protection and safety procedures are utilized. The proximity of chemical, water, sewer, and electrical lines will be identified by the Client's Project Engineer before any subsurface activity or sampling is attempted.

The following safe work practices will be followed during this task:

- The proximity of chemical, water, sewer and electrical lines will be identified by a facility representative prior to any subsurface activity beginning.
- Roux's subsurface protocol or the Client's protocol will be used, whichever is more stringent.
- While excavating, stay out of the reach of the backhoe arm's swing by standing at the end of the excavation, not near the sides (sides have the potential to cave in).

Maximum Allowable Slopes

Soil or Rock Type	Maximum Allowable Slopes (H:V)[1] for Excavations less than 20 Feet Deep[3]
Stable Rock	Vertical (90°)
Type A[2]	¾ : 1 (53°)
Type B	1 : 1 (45°)
Type C	1½ : 1 (34°)

Maximum Allowable Slopes

Soil or Rock Type	Maximum Allowable Slopes (H:V)[1] for Excavations less than 20 Feet Deep[3]

OSHA (29 CFR 1926.652, Subpart P, Appendices A and B)

Notes:

1 Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

2 A short term maximum allowable slope of 1/2H : 1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H : 1V (53°).

3 Sloping or benching for excavations greater than 20 feet deep shall be designed by a Registered Professional Engineer.

Proper stockpiling, containment, and disposal practices will be utilized in regard to the potential amount of waste generated during operations. The location of safety equipment and evacuation procedures will be established prior to initiation of operations according to this HASP. The use of hard hats, eye protection, ear protection, hand protection and steel-toed boots will be required during excavation or other heavy equipment operations.

9.7 Overhead/Underground Power Lines

The positioning or operation of heavy equipment in the vicinity of utility services will not be initiated until the activities have been coordinated with the Client's Project Engineer and SM. Operation of equipment adjacent to or under overhead power lines, in such a manner that encroaches on authorized clearances, will not take place unless one of the following are satisfied:

- Power has been shut off and positive steps are taken to prevent the lines from being energized;
- The equipment does not have the ability to move laterally or horizontally within the minimum clearance specified in the table below, from energized power lines;
- The equipment has been positioned and blocked to allow no part, including cables, to come within the minimum clearance specified in the table below; or
- Excavation operations are not initiated within 25 feet of the verified position of underground power lines.

Minimum Required Clearances for Energized Overhead Power Lines

Nominal System Voltage of Power Line (K V)	Minimum Required Clearance (feet)
0-50	10
51-100	12
101-200	15
201-300	20
301-500	25
501-750	35
751-1000	45

1 kilovolt (KV) = 1,000 volts

9.8 Heavy Equipment Decontamination

If a steam cleaner will be utilized to decontaminate equipment, personnel should exercise caution as the high pressure steam can cause severe burns. Protective gloves, face shields, hard hats, steel-toed boots, and Tyvek suits or rain gear will be worn when using steam cleaners.

9.9 Hot/Cold Work

Roux shall not perform welding unless specific clearance and a hot work permit have been obtained from the Client's Project Engineer, PM or SM. Any contractors or Roux personnel performing welding must adhere to the Client's Hot Work Procedures and the procedures outlined below.

Welding equipment shall be chosen for safe application to the work and shall be installed properly. Employees designated to operate welding equipment shall be properly instructed and qualified to operate it. Mechanical ventilation shall be provided when welding or cutting:

- Where there is less than 10,000 cubic feet of air per welder;
- Where the overhead height is less than 16 feet; and
- Where required by Client practices and procedures (e.g., Confined Space Permitting).

Proper shielding and eye protection shall be used to prevent exposure of personnel to welding hazards. Proper precautions (isolating welding and cutting, removing fire hazards from vicinity, etc.) for fire prevention shall be taken in areas where welding or other "hot work" is being done. All welding operations and other "hot work" shall be scheduled and performed in accordance with the Client's permitting system. The SHSO will be responsible for securing these permits.

9.9.1 Welding in Confined Spaces

All welding and cutting operations carried out in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency and shall be performed in compliance with the Client's and Roux' Confined Space Entry Procedures. In general, oxygen shall never be used for ventilation. In such circumstances where it is impossible to provide ventilation, OSHA requires airline respirators or hose masks approved by the National Institute for Occupational Safety and Health (NIOSH) for this purpose to be utilized. In areas immediately dangerous to life, NIOSH approved powered air purifying respirators (PAPR) or self-contained breathing apparatus (SCBA) shall be used. These exposures and tasks are not to be performed by Roux employees. If the work requires welding in confined spaces, this will only be performed by a qualified welder who is Confined Space Entry Trained (for permit-required entries) and provided with procedures and PPE that satisfy OSHA 29 CFR 1910.134.

9.10 Asbestos

Asbestos may be present at the site as pipe wrap, as part of the pipe material itself (asbestos-cement pipe), or as part of other building materials (e.g., in floor tiles and roofing). Asbestos shall be abated by a licensed abatement contractor according to all applicable laws and standards. Personnel should be aware of the presence of asbestos and avoid contact with friable material. Asbestos-cement pipe can emit airborne fibers if the materials are cut or sawed, or if they are damaged during demolition operations. Handling of these non-friable materials shall be limited to activities that will not generate airborne fibers.

9.11 Heat Stress

Heat stress is a significant potential hazard and can be associated with heavy physical activity and/or the use of personal protective equipment/clothing in hot weather environments.

Heat cramps are brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body resulting in painful muscle cramps. The signs and symptoms of heat stress are as follows:

- Severe muscle cramps, usually in the legs and abdomen;
- Exhaustion, often to the point of collapse; and
- Dizziness or periods of faintness.

First aid treatment includes shade, rest, and fluid replacement. Normally, the individual should recover within one-half hour. If the individual is not better within 30 minutes and the body temperature has not decreased, the individual should be transported to an occupational health clinic or hospital for medical attention.

Heat exhaustion may occur in a healthy individual who has been exposed to excessive heat while working or exercising. The circulatory system of the individual fails as blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms of heat exhaustion are as follows:

- Rapid and shallow breathing;
- Weak pulse;
- Cold and clammy skin with heavy perspiration;
- Skin appears pale;
- Fatigue and weakness;
- Dizziness; and
- Elevated body temperature.

First aid treatment includes cooling the victim, elevating the feet, and replacing fluids. If the individual is not better within 30 minutes and the body temperature has not decreased, the individual should be transported to an occupational health clinic or hospital for medical attention. A New York vicinity city map with the location of Lincoln Hospital Center and City MD and Urgent Care Facility is included as Figure 3 and 4 (see colored tabs).

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a **MEDICAL EMERGENCY** requiring immediate cooling of the victim and transport to an emergency medical facility. The signs and symptoms of heat stroke are as follows:

- Dry, hot red skin;
- Body temperature approaching or above 105 degrees F;
- Large (dilated) pupils; and
- Loss of consciousness - the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to an emergency medical facility.

Heat stress is a significant hazard if any type of protective equipment (semipermeable or impermeable) which prevents evaporative cooling is worn in hot weather environments.

9.12 Cold Stress

Cold stress is a danger at low temperatures and when the wind-chill factor is low. Prevention of cold-related illnesses is a function of whole body protection. Adequate insulating clothing must be used when the air temperature is below 40°F. A work/rest regimen will be initiated when ambient temperatures and protective clothing cause a stressful situation. In addition, reduced work periods followed by rest in a warm area may be necessary in extreme conditions. The signs and symptoms of cold stress include the following:

- Severe shivering;
- Abnormal behavior;
- Slowing;
- Weakness;
- Stumbling or repeated falling;
- Inability to walk;
- Collapse; and/or
- Unconsciousness.

First aid requires removing the victim from the cold environment, and preventing further body heat loss by covering the victim lightly with blankets. Do not cover the victim's face. If the victim is still conscious, administer hot drinks and encourage activity such as walking, wrapped in a blanket. If the victim's conditions do not improve, seek further medical attention.

9.13 Communications

Telephones

- Telephones will be available for communication with emergency support services/ facilities. Telephones are located in the kiosk and are available for communication with emergency support services. In addition, Site personnel are equipped with cellular telephones. Applicable telephone and cellular phone numbers are provided in Section 1.0 (page 3) and in the colored tab section located in the back of this HASP.

Hand Signals

- To be employed by personnel required to use Level C respiratory protection. They shall be known by the entire field team before operations commence and covered during Site-specific training.

Hand Signals

SIGNAL	MEANING
Hand gripping throat	Out of air, can't breathe
Grip partner's wrist	Leave area immediately
Hands on top of head	Need assistance
Thumbs up	I'm alright, okay
Thumbs down	No, negative

9.14 Additional Safe Work Practices

Refer to the SHSO for specific concerns on each individual site task. The safety rules listed below, as well as in the Client's Safe Work Practices Requirements, must be strictly followed:

- Inform SM of planned activities and evaluate the degree of health and safety protection required for each task;
- Practice contamination avoidance, avoid any skin contact with potentially contaminated materials (i.e., surface or ground water, soil, etc.);
- Hard hat and safety eye protection will be worn when inside the exclusion zone;
- Do not carry gum, cigarettes, food drink or cosmetics of any kind into contaminated areas;
- Wash hands before handling food and drink and other activities that could cause hand-to-mouth transfer of contaminants;
- Appropriate foot, hearing, eye, head, and hand protection will be worn by those directly involved in the work efforts when warranted;
- No facial hair that interferes with the face to face piece seal of respirators will be allowed;
- Personnel not involved in the operations, excavating, or monitoring activities will remain a safe distance from the equipment;
- Do not climb over/under obstacles or barricades;
- Be alert to your own physical condition;
- Watch your buddy for signs of fatigue, exposure, heat, or cold stress, etc.;
- No work will be conducted without adequate light;
- Report all accidents, no matter how minor, immediately to the SHSO and the Project Engineer; and

KNOW YOUR HEALTH AND SAFETY PLAN.

10. Decontamination Procedures

10.1 Contamination Prevention

One of the most important aspects of decontamination is the prevention of contamination. Good contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel

- Do not walk through areas of obvious or known contamination;
- Do not handle or touch contaminated materials directly;
- Make sure all personal protective equipment (PPE) has no cuts, tears, or other signs of deterioration prior to donning;
- Fasten all closures on suits, covering with tape, if necessary;
- Take particular care to protect any skin injuries;
- Stay upwind of airborne contaminants; and
- Do not carry cigarettes, gum, etc., into contaminated areas.

Sampling/Monitoring

- When required by the SHSO, cover instruments with clear plastic, leaving opening for sampling and exhaust ports; and
- Bag sample containers prior to the placement of sample material.

Heavy Equipment

- Care should be taken to limit the amount of contamination that comes in contact with heavy equipment;
- Excavated soils should be contained and kept away from workers; and
- Decontaminate equipment prior to moving to another work area.

10.2 Decontamination

The SHSO shall be responsible for determining appropriate decontamination methods for all Site activities. Decontamination water should be collected, handled, drummed, and/or containerized prior to determination of classification and appropriate disposal method (see Section 11.0).

Equipment Decontamination

Sampling equipment will be decontaminated through the following steps, if necessary:

- fresh water rinse;
- non-phosphate detergent wash;
- fresh water rinse; and
- distilled water rinse.

11. Disposal Procedures

All discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left onsite. All potentially contaminated materials should be bagged, drummed, or placed in waste wranglers, as necessary, and placed in a designated area determined by the Client.

All personal protective clothing and sorbent products contaminated with petroleum product will be stored in waste storage containers (i.e., waste wranglers). Additionally, all petroleum products generated from product recovery activities (i.e., well bailing, etc.) will be drummed and stored within the hazardous waste storage area or placed in drums/storage tanks positioned in an area to be determined. All hazardous waste storage containers, tanks, and drums will be labeled with the appropriate hazardous waste labels and/or placards. All contaminated materials will be disposed of in accordance with appropriate regulations. All non-contaminated materials shall be collected and bagged for appropriate disposal as normal domestic waste.

PPE & equipment shall be decontaminated, cleaned, laundered, maintained, or replaced as needed to maintain their effectiveness. Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove the clothing.

12. Emergency Plan

As a result of the hazards onsite and the conditions under which operations are conducted, the possibility of an emergency exists. An emergency plan is required by OSHA (29 CFR 1910.120) to be available for use and is included below. A copy of this plan shall be available in the Support zone at each work site.

In the event of an emergency situation, such as fire, explosion, significant release of particulates, etc., all persons in both the restricted and non-restricted areas will evacuate and assemble near the Support Zone or other safe area as identified by the Site Emergency Coordinator(s). The Site Emergency Coordinator(s) will have authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SHSO or SM must see that access for emergency equipment is provided and that all spark-producing apparatus has been shut down once the alarm has been sounded. Once the safety of all personnel is established, the fire department and other emergency response groups will be notified by telephone of the emergency. Then, other personnel listed in Section 12.4 shall be notified.

12.1 Site Emergency Coordinator(s)

The Site Emergency Coordinator(s) are:

- Site Manager;
- Site Health and Safety Officer;
- Project Engineer; and
- Facility Manager.

The Site Emergency Coordinator(s) shall implement this emergency plan whenever conditions at the site warrant such action. The coordinator(s) will be responsible for assuring the evacuation, emergency treatment, emergency transport of site personnel as necessary, and notification of emergency response units and the appropriate management staff.

12.2 Evacuation

Withdrawal Upwind

The work party will continually note general wind directions while onsite. Upon noting the conditions warranting movement away from the work site, the crew will move upwind a distance of approximately 100 feet or farther, as indicated by the site monitoring instruments. Donning SCBA and a lifeline, SHSO will return to the work site to determine if the condition noted was transient or persistent. If persistent, on-site personnel will be notified of the situation and the need to leave the site or don SCBA. When access to the site is restricted and escape possibly hindered, the crew may be instructed to evacuate the site rather than move upwind, especially if withdrawal upwind moves the crew away from escape routes.

Site Evacuation

Upon determination of conditions warranting site evacuation, the work party will proceed upwind of the work site and notify the SHSO and the Client's Project Engineer of site conditions. If the hazard is toxic gas, respirators will be donned. The crew will proceed to the field office to assess the situation. The advisability and type of further response action will be coordinated and carried out by the SHSO, the PM and the Client's Project Engineer. Site evacuation routes are illustrated in Figure 7.

12.3 Potential or Actual Fire or Explosion

If the potential for a fire exists or if an actual fire or explosion occurs, the following procedure will be implemented:

- Immediately evacuate the site as described above (Section 12.2);
- Notify Client's Project Engineer, SHSO and PM; and
- Notify fire and security. Call **911**

  Fire Department – 911

  Police Department – 911

12.4 Environmental Incident (Release or Spread of Contamination)

If possible, the spread of contamination should be controlled or stopped. The Facility Manager must be informed of the need to contact police and fire authorities to inform them of the possible or immediate need for nearby evacuation. If a significant release has occurred, the National Response Center and other appropriate groups should be contacted by the Facility Manager or his designee. Those groups will alert National or Regional Response Teams as necessary. Following these emergency calls, the remaining personnel listed in the table below shall be notified:

Emergency Telephone Numbers

Type	Name	Telephone #
Fire Department	FDNY	911
HazMat Emergency Response		911
Law Enforcement	NYPD	911
Hospital	Bronx Lebanon Hospital	(718) 860-6169
Ambulance	FDNY	911
Urgent Care Center	City MD	(212) 913-0820
National Response Center (Release or Spill)		(800) 424-8802
Client Contact	Arianna Sacks Rosenberg	
Site Health and Safety Officer	TBD	
Project Manager	Jeffrey Wills	(516) 637-0213
Corporate H&S Manager	Brian Hobbs	(631) 232-2600 (Office) (631) 807-0193 (Cell)

These contacts and phone numbers will be posted in the SZ.

12.5 Personal Injury

If on-site personnel require emergency medical treatment, the following steps will be taken:

1. Notify the Project Manager, Principal, and/or other Roux Senior Management for Illness or Injury Case Management protocol to be initiated.

2. Notify the Fire Department or Ambulance service and request an ambulance or transport the victim to the hospital, as appropriate.
3. Decontaminate to the extent possible prior to administration of first aid or movement to emergency facilities.
4. First aid will be provided by emergency medical services (EMS) or by on-site personnel trained in first aid, CPR, and blood borne pathogens, if available.
5. The OHSM will supply medical data sheets on the victim (if a Roux employee) to appropriate medical personnel.

Accident Report Forms and Medical Services Form are provided in Appendix C.

12.6 Overt Personnel Exposure

If an overt exposure to toxic materials should occur, the exposed person shall be treated onsite as follows:

Skin Contact:	Wash/rinse affected area thoroughly with copious amounts of soap and water, then provide appropriate medical attention. An emergency shower or drench system shall be accessible at the Site at all times. Utilizing eyewash, eyes should be rinsed for at least fifteen (15) minutes upon chemical contamination.
Inhalation:	Move to fresh air and/or, if necessary, decontaminate, and transport to the hospital.
Ingestion:	Decontaminate and transport to emergency medical facility.
Puncture Wound or Laceration:	Decontaminate and transport to emergency medical facility. SHSO will coordinate with the CHSM and the HR Director to obtain medical information on the injured if necessary.

12.7 Adverse Weather Conditions

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

- Heavy rainfall;
- High wind;
- Potential for heat stress;
- Potential for cold stress and cold-related injuries;
- Limited visibility;
- Potential for electrical storms – stop work for a minimum of 15 minutes after observing a lightning strike and for at least 15 minutes after the storm has passed;
- Potential for malfunction of H&S monitoring equipment or gear; and
- Potential for accidents.

12.8 Reportable Incidents at the Site

Since submission of the revised HASP, there has been zero reportable incident(s) at the Site. Any incident where Roux' or Roux employees' vehicles are involved in a collision with structures, equipment, other vehicles, or pedestrians will result in the notification of Roux personnel and Client Managers and completion of an *ACORD*® Automobile Loss Notice Form (attached as Appendix G).

13. 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: The Peninsula Redevelopment Project

Name Printed	Signature	Date

14. Approvals

By their signature, the undersigned certify that this HASP is approved and will be utilized at The Peninsula Redevelopment Project.

Site Health and Safety Officer	Date
Brian Hobbs – Corporate Health and Safety Manager	Date
Jeffrey Wills – Project Manager	Date
Frank Cherena – Project Principal	Date

TABLES

1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at the Site

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 430 Westchester Avenue, Bronx, New York

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 430 Westchester Avenue, Bronx, New York

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 430 Westchester Avenue, Bronx, New York

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, d	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 430 Westchester Avenue, Bronx, New York

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 430 Westchester Avenue, Bronx, New York

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 430 Westchester Avenue, Bronx, New York

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% Classs 1B Flammable Liquid

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 430 Westchester Avenue, Bronx, New York

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 430 Westchester Avenue, Bronx, New York

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

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 430 Westchester Avenue, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
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%
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, blured vision, drowsiness, confusion, disorientation	Eyes, skin,repiratory 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

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 430 Westchester Avenue, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
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
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 %

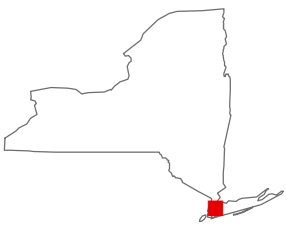
Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 430 Westchester Avenue, Bronx, New York

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
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%
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% Classs 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
2. Site Plan
3. Route to Hospital
4. Route to Urgent Care Center

QUADRANGLE LOCATION



N

1,000 0 1,000 2,000

Feet

Title:

SITE LOCATION MAP

1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For:

THE PENINSULA JV, LLC

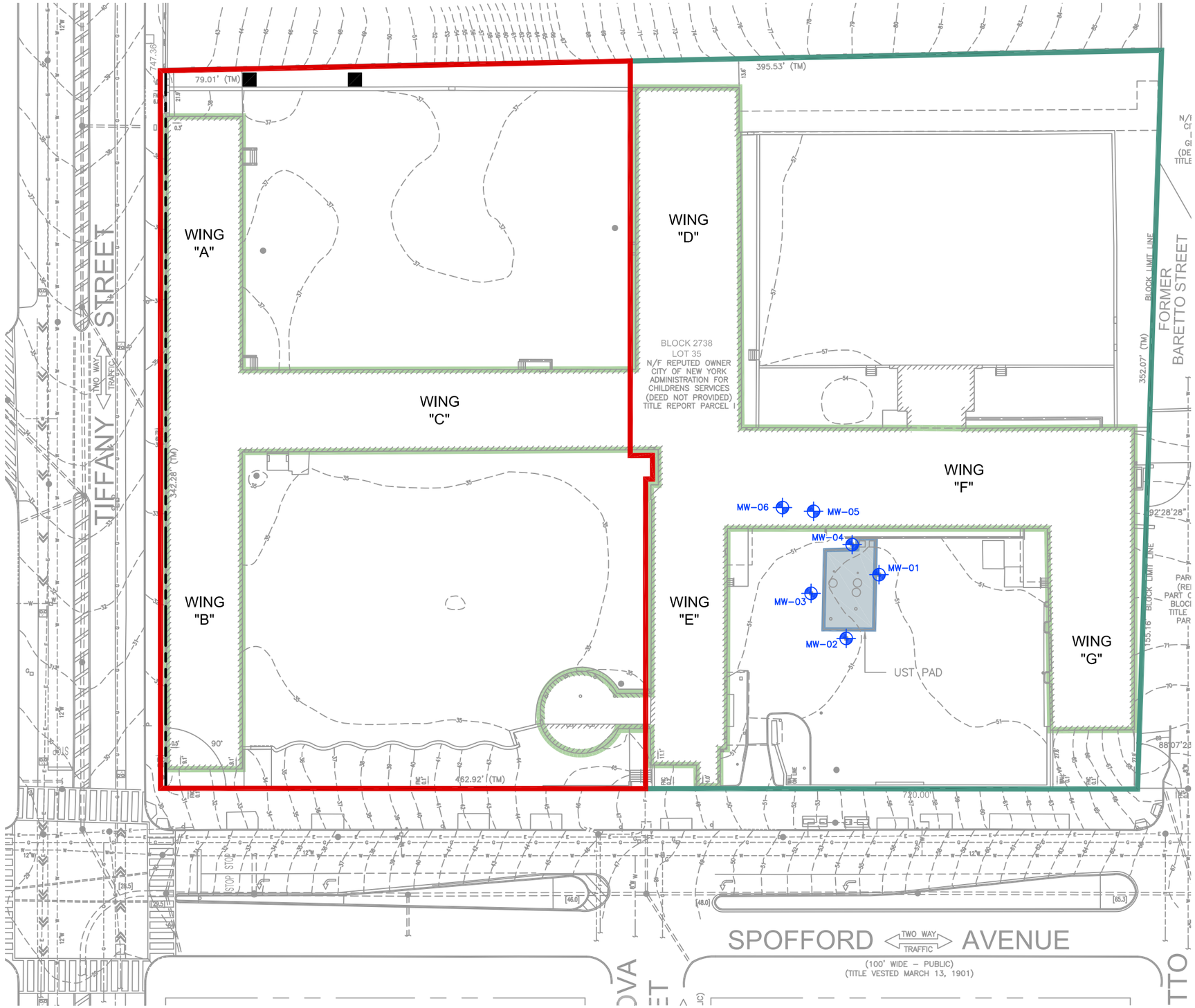
ROUX

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: J.P.G.	Date: 16JUN17
Prepared by: M.R.	Scale: AS SHOWN
Project Mgr: J.P.G.	Project: 2611.0002Y000
File: 2611.0002Y104.1.mxd	

FIGURE 1

V:\GIS\Projects\2611\0002Y\104\2611.0002Y104.1.mxd



LEGEND

- SITE BOUNDARY
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS 2014
- APPROXIMATE TEST PIT LOCATION
- BUILDINGS TO BE DEMOLISHED
- UST PAD LOCATION, 002 AND 003 (TWO 12,000 GALLON USTs)
- BUILDING DEMOLITION PHASE I
- BUILDING DEMOLITION PHASE II

50' 0 50'

Title:

SITE PLAN

1221 SPOFFORD AVENUE
BRONX, NEW YORK

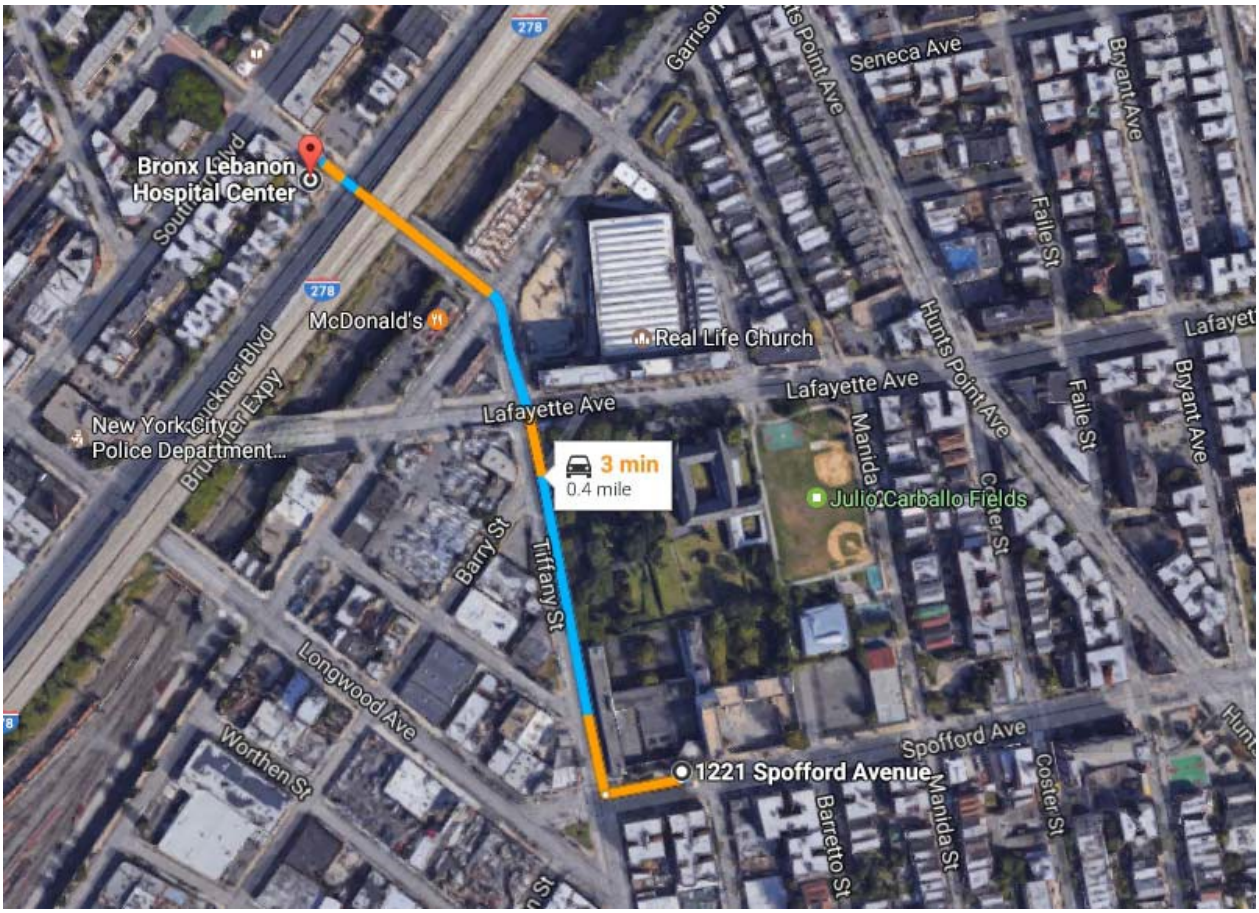
Prepared For:
THE PENINSULA JV, LLC

ROUX

Compiled by: D.H.	Date: 30MAY18	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	2
Project Mgr: D.H.	Project: 2611.0002Y000	
File: 2611.0002Y108R.01.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\108R\2611.0002Y108R.01.DWG

Figure 3. Directions to Bronx Lebanon Hospital Center



Bronx Lebanon Hospital Center
853 Tiffany Street
Bronx, New York, 10459

- Head west on Spofford Avenue toward Tiffany Street (187 feet)
- Turn right onto Tiffany Street (0.3 mi)
- Slight left near Garrison Avenue
- Destination will be on the left

Figure 4. Directions to City MD

City MD
80 West 125th Street
New York, New York

- 1221 Spofford Avenue, Bronx, New York
- Head west on Spofford Avenue toward Tiffany Street (413 feet)
- Turn Right onto Longwood Avenue (0.2 mi)
- Turn left at the 3rd cross street onto Bruckner Blvd (1.0 mi)
- Keep left to stay on Bruckner Blvd (1.2 mi)
- Use middle lane to continue on Third Avenue Bridge (0.3 mi)
- Keep right to stay on Third Avenue Bridge (243 ft)
- Continue straight on E 129th Street (0.3 mi)
- Turn left onto 5th Avenue. (0.2 mi)
- Turn right onto West 125th Street, destination will be on the left (0.2 mi)

APPENDICES

A. Job Safety Analysis Forms
B. Hazard Communication MSDS/SDS for Chemicals Used
C. Roux Health and Safety Lessons Learned/Accident Report Forms
D. Health and Safety Briefing/Meeting Log and Daily Site Safety Checklist
E. Roux Heavy Equipment Exclusion Zone Policy
F. Roux Subsurface Utility Clearance Procedure
G. *ACORD*® Automobile Loss Notice Form
H. Job Safety and Health Protection Poster
I. Community Air Monitoring Plan (CAMP)

APPENDIX A

Job Safety Analysis Forms

List Job Safety Analyses Forms which are required for the project and are included in Appendix A below:

1. Job Safety Analysis Form
2. Site Walk and Inspection
3. Mobilization and Demobilization
4. Excavation and Trenching
5. Soil Sampling
6. Backfilling Excavation and Compaction
7. Trucking

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		☐ OTHER
☐ LIFELINE / BODY HARNESS	☐ HEARING PROTECTION	☐ SUPPLIED RESPIRATOR	
☐ SAFETY GLASSES	☐ SAFETY SHOES	☐ PPE CLOTHING:	

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	Cntrl. No. GEN-011	DATE: 1/18/2015	☐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
Anthony Giannetti	Staff Geologist	Daniel Abberton	SHSM
		Mike Ritorto	Project Hydrogeologist
		Joe Gentile	CHSM

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, sleeved shirt	☒ 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 and/or guide familiar with Site, operating cell phone or walkie-talkie if Site allows.

Commitment to LPS – 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.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Check in with Site manager.	**1a. CONTACT/EXPOSURE/FALL:** Lack of communication could result in H&S incident.	1a. Inform Site personnel of work scope, timeline and location(s). 1a. Inquire about hazards and other activities taking place at the Site. 1a. Discuss emergency evacuation procedures and muster points with Site manager..
2. Traversing the Site and setting up at work locations.	**2a. CONTACT:** Property damage and personal injury caused by obstructions/vehicles or unauthorized personnel at remote Sites.	2a. Maintain speed limit of 5 mph on-site. 2a. All equipment must be stowed and secured prior to moving. Use wheel chocks on all construction vehicles when not in motion. 2a. Drive on established roadways. 2a. Yield to all pedestrians. 2a. Do not back up vehicle without spotter where visibility is limited; use pull-through spots or back into parking spots; use an audible signal (horn/back-up alarm) when backing up vehicles. 2a. Wear 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. 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. 2c. Two people or a mechanical lifting device are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift.
	2d. EXPOSURE: Biological hazards - ticks, bees/wasps, poison ivy, insects, etc. (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 use 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 to remove nests. Protect exposed skin with insect repellent. 2d. Poison Ivy: • Identify areas of poison ivy and spray with weed killer. Don Tyvek and rubber boots while traversing poison ivy areas. • If skin comes in contact with poison ivy, wash skin thoroughly with soap and water.

[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; 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."

	2e. EXPOSURE: Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	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. Define and secure the work area.	**3a. CONTACT:** Personal injury or property damage from other vehicles on-site.	3a. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route. 3a. Look both ways in high traffic areas. 3a. Position vehicle to protect against oncoming traffic. 3a. Use 42” traffic cone and caution tape to delineate work area. Use a spotter in high traffic areas. 3a. Wear high visibility clothing/safety vest.
4. Walking near heavy equipment and machinery.	**4a. CONTACT:** Personal injury from Site and roadway traffic. Personal injury from flying debris.	4a. See 3a. 4a. Place traffic cones to re-direct traffic flow around work area and to alert others as to activity taking place. Evaluate possible need for police detail and request as needed. 4a. Maintain a minimum exclusion zone of 10 feet from all equipment. Task specific JSAs should be referenced to determine the actual exclusion zone for the piece of equipment being used. 4a. Keep body parts out of the line of fire of pinch points. 4a. Routinely inspect work area and be aware of location of all Site personnel. Make eye contact with spotter, if provided, or operator prior to entering the work area. 4a. Wear safety glasses at all times.
	4b. OVEREXERTION: Personal injury from lifting/moving/rotating equipment.	4b. See 2c.
	4c. EXPOSURE: Hearing damage from excavation activities. Inhalation/exposure to hazardous vapors and or dust.	4c. Monitor air quality with multi-gas meter and dust meter, if necessary. Use water to suppress dust, if necessary. Wear dust mask, if necessary. 4c. Wear hearing protection if >85 dBA. 4c. Always wear leather gloves when handling any tools or equipment. Wear cut-resistant gloves (Kevlar or similar) when handling sharp objects, glassware or cutting tools.
	4d. EXPOSURE: Working in a remote area.	4d. Use the "buddy system" whenever possible. If working alone, contact PM upon arrival/departure, as well as during work activities prior to commencing work. 4d. Always carry a communication (i.e., cell phone, walkie-talkie) or directional (i.e., map, compass, etc.) device when traversing remote areas.
5. Working in adverse weather conditions.	**5a. EXPOSURE:** Heat Stress & Cold Stress. Personal injury from working in inclement weather conditions.	5a. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 5a. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks as needed. 5a. Wear appropriate rain gear as needed. 5a. Take frequent breaks if tired, wet, or cold/hot. Drink water. 5a. If lightning is observed, wait 30 minutes after last thunder boom/lightning bolt in a sheltered location (car acceptable) before starting work again.
6. Departing Site.	**6a. EXPOSURE:** Exposure to unnecessary hazards should personnel believe Roux is on-Site during an emergency and conduct a search.	6a. Sign out or notify Site personnel of your departure.

[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; 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".

JOB SAFETY ANALYSIS	Cntrl. No. GEN-010	DATE: 1/15/2014	☐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
Jared Lefkowitz	Staff Assistant Scientist	Daniel Abberton	SHSM
John Williams	OHSM	Mike Ritorto	Project Hydrogeologist
		Joe Gentile	CHSM

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

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

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: None

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

EXCLUSION ZONE: A minimum exclusion zone of 10' will be maintained around moving equipment (if heavy equipment is utilized)

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. 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 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. 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 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 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.

[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; 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."

		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, 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: Heat and cold related injuries.	1f. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). Take breaks as needed. 1f. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks 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).

[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; 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".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-011	DATE: 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**Construction - Excavation**	**Excavation / Trenching**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
David Kaiser	Project Engineer	Brian Hobbs	Senior Health & Safety Manager
Ian Holst	Project Engineer	Joseph Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather or cut resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☒ LONG SLEEVED SHIRT	☒ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility long sleeved clothing	
☐ LIFELINE / BODY HARNESS	☒ SAFETY SHOES: Steel-toe boots		
☒ SAFETY GLASSES			

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Jackhammer, Excavator, Backhoe, Hand Tools, Photoionization Detector, barrels, 42" traffic cones, snow fencing, telescoping poles, temporary chain link fence, ladders, shovels, digging bars, power tools (cut-off saw), Two-way radios, Sheeting, Trench box, Retractable lanyard, Harness

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 motion and outside the swing/tip radius.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Pre-Clearance Protocol.	**1a. CONTACT:** Damage to underground utility.	1a. Confirm that (if applicable) "Call Before You Dig" and local utility companies were contacted prior to trenching in order to confirm utility mark outs. Must have a case # before digging.
	1b. ENERGY SOURCE/CONTACT: Property damage; Pressurized water mains may cause lacerations or broken bones. Pressurized gas mains may explode causing serious injury, or death. Underground electric may cause severe burns, shock, or death.	1b. Pre-clearing of the trenching location must be conducted to a minimum of 5 vertical feet below the ground surface (10 feet minimum for Critical Zone) using hand tools (shovel and non-metallic dig bar) prior to trenching. Supervisor should be contacted to discuss appropriate pre-clearing depth. Complete subsurface clearance checklist.
	1c. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions, lacerations, or broken bones.	1c. Be aware of the conditions when walking or loading equipment and working. Walk within established pathway avoiding uneven surfaces. Remove potential slip/trip/fall hazards.
2. Set up work zone.	**2a. CONTACT/CAUGHT:** Cuts/lacerations from equipment. Broken bones from contact by vehicle.	2a. Isolate work area from hazards with cones, barricades, and snow fencing, telescoping poles or temporary chain link fence. Utilize a flag person when necessary (i.e., third party traffic in area). Install traffic signs in roadways and for detours. Spotters will maintain and enforce exclusion zone.
	2b. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions, lacerations, or broken bones.	2b. See 1c.

[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, 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".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Trenching Activity.	**3a. CONTACT:** Serious injury including broken bones, muscle strains or tears, and possibly death due to contact with machine.	3a. Spotter(s) required for all heavy equipment operation. No worker shall be allowed inside the exclusion zone or along the trench/excavation area while any equipment is in operation. A minimum exclusion zone greater than the length of the equipment boom must be established. Workers only allowed in exclusion zone if the operator is in "Hands Off "mode. Operator will not operate equipment until worker is out of exclusion zone. Spotters and operators will have radios for communication, when either loses sight of one another, and/or in case of emergency.
	3b. FALL: Slip, Trip or Fall may cause muscle strains or tears, abrasions, lacerations, or broken bones	3b. Any trench/excavation deeper than 3' must have a ladder within 25' of any worker in the excavation. At least 3'(rungs) of the ladder shall be above the top of the excavation. All spoil piles shall be maintained 2' minimum from edge of excavation. 3b. Any trench/excavation deeper than 6' must have fall protection, retractable lanyard for ladder use, and 42" high guardrails along the edge of the trench/excavation.
	3c. EXPOSURE: Noise, Dust, Concrete- Asphalt, petroleum hydrocarbon vapors may cause damage to ears and lungs	3c. Air monitoring using a calibrated photoionization detector (PID) will be used to monitor the breathing zone of the work area. If a reading of >5ppm is recorded, the oversight personnel must temporarily cease work and instruct all Site personnel to step away from the area of elevated readings.
4. Setting Trench protections if necessary.	**4a. CAUGHT:** Injury due to contact with failed trench, may include muscle strains or tears, abrasions or lacerations, broken bones and possibly death.	4a. To prevent cave-ins and avoid caught by/between, excavations over 4' in depth, unless working in stable rock, shall have engineer approved shoring, sheeting or trench box. Top of protection shall be at least 2' above top of excavation.
	4b. CONTACT/CAUGHT: Injury due to rigging activities and entering exclusion zone during lifting and/or transport of shoring/trench box/material may include muscle strains or tears, abrasions or lacerations, broken bones and possibly death.	4b. Use only inspected rigging with 2, 3 or 4 lift points; wear cut-resistant gloves. Rigging to be hooked up to factory installed hook up points on equipment. Control load with non-conductive tag lines with workers out of exclusion zone. Don't stand underneath suspended load; wear steel toed boots and hard hat.
	4c. FALL: Possible injury due to fall into excavation may include muscle strains or tears, abrasions or lacerations, or broken bones.	4c. Shoring to be set and sides will be backfilled to avoid fall hazards before workers are allowed to enter area. Operator will be in "HANDS OFF" mode before workers enter work area to unhook rigging. An inspected ladder extending 3' above top of the shoring will be used to enter and exit the shoring. Workers will use three points of contact when using the ladder.
5. Secure/Leave Site. If backfilling, see excavation backfilling and compaction JSA for potential hazards and critical actions.	**5a. FALL:** Potential Slip, Trip or Fall - may cause muscle strains or tears, abrasions or lacerations, or broken bones.	5a. See 1c. 5a. All open excavations must be backfilled or secured prior to departure with steel plates, orange construction fence or temporary chain link fencing.

[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; 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".

JOB SAFETY ANALYSIS Cntrl. No. GEN-012	DATE: 2/3/2015	☐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**
Michael Hodess	Staff Environmental Scientist	Mike Ritorto	Senior Hydrogeologist
		Leo Kurylo	IL-OHSM

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

EXCLUSION ZONE: A minimum 10' 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 orderlymanner. 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 appropriate (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, 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 resistant 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/repel 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. 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 and the CHSM for possible consultation with a physician at an approved Occupational Health Clinic.

[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; 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
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.	2a. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant 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 disposable gloves over cut resistant gloves to protect hands when handling samples; use containment material or plastic sheeting to protect surrounding areas. 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.
3. Decontaminate equipment	3a. **EXPOSURE/CONTACT:** Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated vapors and/or soil).	3a. Wear chemical-resistant 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. **EXPOSURE:** Chemicals in cleaning solution including ammonia.	3b. Wear chemical-resistant disposable gloves and safety glasses. 3b. Work on the upwind side of decon. area. 3b. Use an absorbent pad to clean spills. 3b. Properly dispose of used materials/PPE in provided drums in designated drum storage area.

[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; 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".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-003	DATE 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
GENERIC	**Construction - Excavation**	**Backfilling Excavation & Compaction**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
David Kaiser	Project Engineer	Brian Hobbs	Senior Health & Safety Manager
Edward Lacina	Senior Construction Manager	Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST	☐ GOGGLES	☐ AIR PURIFYING RESPIRATOR	☒ GLOVES: Leather/ cut-resistant level 2
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	
☐ LIFELINE / BODY HARNESS	☒ HEARING PROTECTION	☒ PPE CLOTHING: reflective DOT approved safety	☐ OTHER _____
☒ SAFETY GLASSES	☒ SAFETY TOE BOOTS		

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Payloader, Backhoe, Dump Trucks, Mechanical gas powered tampers, Excavator with hydraulic tamper. APR when tamping if dust present. Two-way radios.

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

EXCLUSION ZONE: A 10' minimum exclusion zone will be maintained around excavator, backhoe, tampers, and dump trucks.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Pre-construction meeting: Review proposed excavation locations	**1a. CONTACT:** Potential for contact with subsurface utilities and above ground utilities	1a. Call state 811 for mark out service and one call ticket. 1a. Obtain private utility mark out service as necessary. 1a. Review and mark proposed excavations w/white paint. 1a. Identify all "Critical" zones. A Critical zone is any area within 10 feet of any operating utility. 1a. **Complete subsurface clearance checklist.** 1a. Soft dig must be conducted within 2 lateral feet of any suspected underground utility. 1a. Protection of aboveground utilities identified as being located within the work zone must be coordinated w/ client and utility owner.
2. Secure Work Area	**2a. CONTACT:** Potential for personnel to enter the work area. Potential for equipment to contact, or crush personnel. **2b. EXERTION:** Potential for muscle strain or tear while installing traffic cones and barrel	2a. Ensure work area is secure and inform others of work activity. Establish a heavy equipment exclusion zone (HEEZ) using 42" traffic cones, barrels & snow fencing or telescoping poles. Use of flag persons to maintain clear traffic and to minimize motorist confusion during set-up of new traffic pattern. HEEZ to include tip/swing radius of equipment. 2a. Dump Truck/Excavator/Payloader/Backhoe equipment to be set-up by personnel who are familiar with machinery. Spotters shall be in place for all equipment. and to control access to the HEEZ 2a. Truck wheels are chocked when driver is not in truck and engine shut off. 2a. Personnel shall stay out of the exclusion zone (10' minimum or greater than the equipment boom) while equipment is maneuvering. 2b. Keep back straight, keep load close to the body and bend knees while lifting and working. If over 50 lbs., use 2 or more laborers for lifting or use of 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 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; 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. Backfilling excavation, and compaction	**3a. CONTACT:** Traffic and live equipment.	3a. Equipment and trucks shall be isolated from other workers, subcontractors and third party traffic with 42" traffic cones, barricades, snow fencing or telescoping poles, and/or Jersey barriers. Spotters shall direct dump truck for placement of fill near excavation. Pay loader/ Excavator, as directed by spotter, shall move fill into trench where it shall be placed in layers and compacted by mechanical means. 3a. Spotters will wear florescent vests at all times. 3a. Spotters will remain out of the exclusion zone, line of fire from equipment and third-party vehicles. 3a. Spotters and operators will have radios for communication, when other visual and/or hand signals are insufficient. 3a. Locate all overhead utilities. All personnel and machinery should maintain a 10' distance from overhead electric lines. Refer to OSHA chart for distances and voltage. 3a. For excavations engineered (shored, sloped, benched} all personnel, equipment, and materials must remain a minimum of 2 feet from edge of excavation.
	. **3b. EXPOSURE:** Fumes from gas powered tamper	3b. Fueling of all equipment will be done outside of work area in a well-ventilated area. Refueling will be done only after a 2-5-minute cool down.
	3c. FALL: Slips, trips, fall hazards.	3c. Work area will be clean and free of any debris to remove slip, trip and fall hazards. All tools will be kept in designated areas. Insure work area is well illuminated. 3c. Workers should only be working in areas that have been leveled with a machine. 3c. All persons working at elevations over 6' shall use a guardrail system or personal fall arrest system while around excavation.
	3d. OVEREXERTION: Muscle strain, or tear.	3d. Keep knees bent and back straight while transferring/ lifting/lowering tamper from elevated areas. Utilize a co-worker to avoid staining muscles. 3d. Keep knees bent and back straight while maneuvering tamper. Utilize a co-worker to avoid staining muscles.
	3e. EXPOSURE: Noise from tamper. Dust inhalation.	3e. Workers will wear hearing protection during compaction tamper activities. 3e. Wear NIOSH approved dust mask for personal comfort. If dust is visible for extended time, limit by wetting down area. 3e. If dust continues stop work and evaluate if APR is needed with approval and clearance.
4. Secure/leave site.	**4a. FALL:** Slip, trip, fall	4a. Clear work area of all debris and store all equipment in designated areas/containers before opening to traffic. 4a. Replace fencing and barricades as needed to secure path before opening roadway or area up to traffic(vehicle, pedestrian and/or bicycle).

[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; 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".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-025	DATE: 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 1

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)
Generic	**General**	**Trucking**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Lauren Dolginko	Project Geologist	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: Leather or cut resistant
☒ HARD HAT	☐ FACE SHIELD	☐ SUPPLIED RESPIRATOR	☐ OTHER
☐ LONG SLEEVED SHIRT	☐ HEARING PROTECTION	☒ PPE CLOTHING: Fluorescent reflective vest or high visibility long sleeved clothing	
☐ LIFELINE / BODY HARNESS	☒ SAFETY SHOES: Steel-toe boots		
☒ SAFETY GLASSES			

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Heavy equipment (i.e. trucks)

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

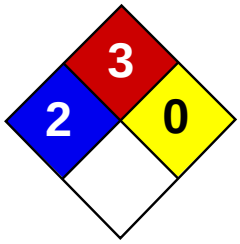
EXCLUSION ZONE: A 10' minimum exclusion zone will be maintained around excavator, backhoe, dump trucks and other heavy equipment.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Set up work zone.	**1a. CONTACT:** Personal injury/property damage caused by obstruction/vehicle.	1a. Establish work zone for manifesting/paperwork by communicating with workers before task begins. Maintain a **10 ft Exclusion Zone (EZ)** around all heavy equipment.
2. Loading of truck.	**2a. CONTACT:** Rolling Vehicle could cause bodily harm. **2b. CONTACT:** Machine or load may crush personnel, property or machinery. **2c. CONTACT:** Load shifting during travel.	2a. All commercial vehicles without an operator must have their engines off and wheels chocked. Truck and loading area should be on level ground. 2b. All machines (Excavator, Lull, Backhoe) must have a spotter. Spotter must communicate contact hazards such as other personnel in the work area, objects in the machine's blind spot, and overhead lines to the operator. Spotter and operator should have 2-way radios or established hand signals to communicate when needed. 2b. Loads must not be swung over other vehicles or personnel. 2b. Maintain **10ft EZ** around all equipment. 2c. Secure all loads prior to moving the truck with chains or straps or cribbing. 2c. Any loose soil or debris should be cleaned off truck sides prior to truck mobilization. 2c. All truck beds must be secured prior to traveling.
3. Dumping loads.	**3a. CONTACT:** Truck may flip sideways or backwards.	3a. All workers must stay behind and away from the side of trucks that are dumping to avoid contact with the truck potentially tipping sideways or backwards. EZ must be maintained equal to the height of bed while lifted.
4. Exchanging paperwork with truck driver.	**4a. CONTACT/CAUGHT:** Broken bones from contact by vehicle. **4b. FALL:** Slip, Trip or Fall may cause muscle strains or tears, abrasions or lacerations, or broken bones.	4a. Truck driver should exit truck with proper PPE and enter the established work zone to complete paperwork. If Site-specific safety prohibits drivers from exiting the truck, wait until truck is finished loading, with engine turned off, before approaching truck. 4a. Always establish eye contact with driver prior to approaching truck. 4a. Confirm sides of truck have been cleaned/brushed off prior to approaching truck. 4b. Survey walking route to identify slip/trip/fall hazards. Avoid icy/wet surfaces. Remove slip/trip/fall hazards if present. 4b. Communicate with driver and spotter prior to approaching truck. Maintain a **10 ft EZ** around all heavy 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 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, 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".

APPENDIX B

Hazard Communication MSDS /
SDS for Chemicals Used



Material Safety Data Sheet
Benzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Benzene

Catalog Codes: SLB1564, SLB3055, SLB2881

CAS#: 71-43-2

RTECS: CY1400000

TSCA: TSCA 8(b) inventory: Benzene

CI#: Not available.

Synonym: Benzol; Benzine

Chemical Name: Benzene

Chemical Formula: C6-H6

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
Benzene	71-43-2	100

Toxicological Data on Ingredients: Benzene: ORAL (LD50): Acute: 930 mg/kg [Rat]. 4700 mg/kg [Mouse]. DERMAL (LD50): Acute: >9400 mg/kg [Rabbit]. VAPOR (LC50): Acute: 10000 ppm 7 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of eye contact (irritant), of inhalation. Hazardous in case of skin contact (irritant, permeator), of ingestion. Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC. MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE]. The substance is toxic to blood, bone marrow, central nervous system (CNS). The substance may be toxic to liver, Urinary System. Repeated or prolonged exposure to the substance can produce target organs damage.

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. WARM water MUST be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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 if symptoms appear.

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. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 497.78°C (928°F)

Flash Points: CLOSED CUP: -11.1°C (12°F). (Setaflash)

Flammable Limits: LOWER: 1.2% UPPER: 7.8%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials, of acids.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Extremely flammable liquid and vapor. Vapor may cause flash fire. Reacts on contact with iodine heptafluoride gas. Dioxygenyl tetrafluoroborate is as very powferful oxidant. The addition of a small particle to small samples of benzene, at ambient temperature, causes ignition. Contact with sodium peroxide with benzene causes ignition. Benzene ignites in contact with powdered chromic anhydride. Virgorous or incandescent reaction with hydrogen + Raney nickel (above 210 C) and bromine trifluoride.

Special Remarks on Explosion Hazards:
Benzene vapors + chlorine and light causes explosion. Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate. Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion. Interaction

of nitryl perchlorate with benzene gave a slight explosion and flash. The solution of permanganic acid (or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene. Peroxodisulfuric acid is a very powferful oxidant. Uncontrolled contact with benzene may cause explosion. Mixtures of peroxomonsulfuric acid with benzene explodes.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. 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 away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. 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, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

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:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

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:
TWA: 0.5 STEL: 2.5 (ppm) from ACGIH (TLV) [United States] TWA: 1.6 STEL: 8 (mg/m3) from ACGIH (TLV) [United States] TWA: 0.1 STEL: 1 from NIOSH TWA: 1 STEL: 5 (ppm) from OSHA (PEL) [United States] TWA: 10 (ppm) from OSHA (PEL) [United States] TWA: 3 (ppm) [United Kingdom (UK)] TWA: 1.6 (mg/m3) [United Kingdom (UK)] TWA: 1 (ppm) [Canada] TWA: 3.2 (mg/m3) [Canada] TWA: 0.5 (ppm) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor:
Aromatic. Gasoline-like, rather pleasant. (Strong.)

Taste: Not available.

Molecular Weight: 78.11 g/mole

Color: Clear Colorless. Colorless to light yellow.

pH (1% soln/water): Not available.

Boiling Point: 80.1 (176.2°F)

Melting Point: 5.5°C (41.9°F)

Critical Temperature: 288.9°C (552°F)

Specific Gravity: 0.8787 @ 15 C (Water = 1)

Vapor Pressure: 10 kPa (@ 20°C)

Vapor Density: 2.8 (Air = 1)

Volatility: Not available.

Odor Threshold: 4.68 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Miscible in alcohol, chloroform, carbon disulfide oils, carbon tetrachloride, glacial acetic acid, diethyl ether, acetone. Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles.

Incompatibility with various substances: Highly reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Benzene vapors + chlorine and light causes explosion. Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate. Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion. Interaction of nitryl perchlorate with benzene gave a slight explosion and flash. The solution of permanganic acid (or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene. Peroxodisulfuric acid is a very powferful oxidant. Uncontrolled contact with benzene may cause explosion. Mixtures of peroxomonsulfuric acid with benzene explodes.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 930 mg/kg [Rat]. Acute dermal toxicity (LD50): >9400 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 10000 7 hours [Rat].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC. MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE]. Causes damage to the following organs: blood, bone marrow, central nervous system (CNS). May cause damage to the following organs: liver, Urinary System.

Other Toxic Effects on Humans:
Very hazardous in case of inhalation. Hazardous in case of skin contact (irritant, permeator), of ingestion.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (female fertility, Embryotoxic and/or foetotoxic in animal) and birth defects. May affect genetic material (mutagenic). May cause cancer (tumorigenic, leukemia)) Human: passes the placental barrier, detected in maternal milk.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. It can be absorbed through intact skin and affect the liver, blood, metabolism,and urinary system. Eyes: Causes eye irritation. Inhalation: Causes respiratory tract and mucous membrane irritation. Can be absorbed through the lungs. May affect behavior/Central and Peripheral nervous systems (somnolence, muscle weakness, general anesthetic, and other symptoms similar to ingestion), gastrointestinal tract (nausea), blood metabolism, urinary system. Ingestion: May be harmful if swallowed. May cause gastrointestinal tract irritation including vomiting. May affect behavior/Central and Peripheral nervous systems (convulsions, seizures, tremor, irritability, initial CNS stimulation followed by depression, loss of coordination, dizziness, headache, weakness, pallor, flushing), respiration (breathlessness and chest constriction), cardiovascular system, (shallow/rapid pulse), and blood.

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 3: Flammable liquid.

Identification: : Benzene UNNA: 1114 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Benzene California prop. 65 (no significant risk level): Benzene: 0.007 mg/day (value) California prop. 65: This product contains the following ingredients

for which the State of California has found to cause cancer which would require a warning under the statute: Benzene Connecticut carcinogen reporting list.: Benzene Connecticut hazardous material survey.: Benzene Illinois toxic substances disclosure to employee act: Benzene Illinois chemical safety act: Benzene New York release reporting list: Benzene Rhode Island RTK hazardous substances: Benzene Pennsylvania RTK: Benzene Minnesota: Benzene Michigan critical material: Benzene Massachusetts RTK: Benzene Massachusetts spill list: Benzene New Jersey: Benzene New Jersey spill list: Benzene Louisiana spill reporting: Benzene California Director's list of Hazardous Substances: Benzene TSCA 8(b) inventory: Benzene SARA 313 toxic chemical notification and release reporting: Benzene CERCLA: Hazardous substances.: Benzene: 10 lbs. (4.536 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 B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R11- Highly flammable. R22- Harmful if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes. R45- May cause cancer. R62- Possible risk of impaired fertility. S2- Keep out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection. S46- If swallowed, seek medical advice immediately and show this container or label. S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

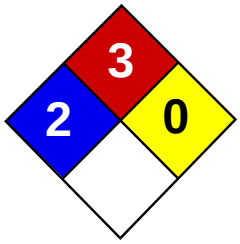
References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:35 PM

Last Updated: 11/06/2008 12:00 PM

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



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Toluene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Toluene

Catalog Codes: SLT2857, SLT3277

CAS#: 108-88-3

RTECS: XS5250000

TSCA: TSCA 8(b) inventory: Toluene

CI#: Not available.

Synonym: Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol

Chemical Name: Toluene

Chemical Formula: C6-H5-CH3 or C7-H8

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
Toluene	108-88-3	100

Toxicological Data on Ingredients: Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

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. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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.

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 medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).

Flammable Limits: LOWER: 1.1% UPPER: 7.1%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:
Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide; concentrated nitric acid, sulfuric acid + nitric acid; N2O4; AgClO4; BrF3; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. 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. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. 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 away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. 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.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

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:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

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:
TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States] TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 100 STEL: 150 from NIOSH [United States] TWA: 375 STEL: 560 (mg/m3) from NIOSH [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweet, pungent, Benzene-like.

Taste: Not available.

Molecular Weight: 92.14 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 110.6°C (231.1°F)

Melting Point: -95°C (-139°F)

Critical Temperature: 318.6°C (605.5°F)

Specific Gravity: 0.8636 (Water = 1)

Vapor Pressure: 3.8 kPa (@ 25°C)

Vapor Density: 3.1 (Air = 1)

Volatility: Not available.

Odor Threshold: 1.6 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.7

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Soluble in diethyl ether, acetone. Practically insoluble in cold water. Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide. Solubility in water: 0.561 g/l @ 25 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources (flames, sparks, static), incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride. Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C. Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 636 mg/kg [Rat]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin. Eyes: Cauess mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abraisons. This usually resolves in 2 days. Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia,), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite. Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation. Chronic Potential Health Effects: Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophostatemia), severe, muscle weakness and Rhabdomyolysis. Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

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 3: Flammable liquid.

Identification: : Toluene UNNA: 1294 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene California prop. 65 (no significant risk level): Toluene: 7 mg/day (value) California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene Connecticut hazardous material survey.: Toluene Illinois

toxic substances disclosure to employee act: Toluene Illinois chemical safety act: Toluene New York release reporting list: Toluene Rhode Island RTK hazardous substances: Toluene Pennsylvania RTK: Toluene Florida: Toluene Minnesota: Toluene Michigan critical material: Toluene Massachusetts RTK: Toluene Massachusetts spill list: Toluene New Jersey: Toluene New Jersey spill list: Toluene Louisiana spill reporting: Toluene California Director's List of Hazardous Substances.: Toluene TSCA 8(b) inventory: Toluene TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/0/92 SARA 313 toxic chemical notification and release reporting: Toluene CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 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 B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S25- Avoid contact with eyes. S29- Do not empty into drains. S33- Take precautionary measures against static discharges.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

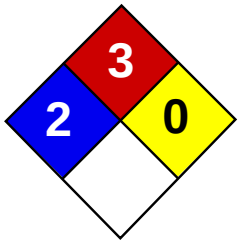
Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:30 PM

Last Updated: 11/06/2008 12:00 PM



Material Safety Data Sheet
Ethylbenzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylbenzene

Catalog Codes: SLE2044

CAS#: 100-41-4

RTECS: DA0700000

TSCA: TSCA 8(b) inventory: Ethylbenzene

CI#: Not available.

Synonym: Ethyl Benzene; Ethylbenzol; Phenylethane

Chemical Name: Ethylbenzene

Chemical Formula: C8H10

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
Ethylbenzene	100-41-4	100

Toxicological Data on Ingredients: Ethylbenzene: ORAL (LD50): Acute: 3500 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant, sensitizer). CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

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. WARM water MUST be used. Get medical attention.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

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 medical attention.

Ingestion:
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 if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 432°C (809.6°F)

Flash Points:
CLOSED CUP: 15°C (59°F). (Tagliabue.) OPEN CUP: 26.667°C (80°F) (Cleveland) (CHRIS, 2001) CLOSED CUP: 12.8 C (55 F) (Bingham et al, 2001; NIOSH, 2001) CLOSED CUP: 21 C (70 F) (NFPA)

Flammable Limits: LOWER: 0.8% - 1.6%UPPER: 6.7% - 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Vapors may form explosive mixtures in air.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. 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 away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Sensitive to light. Store in light-resistant containers.

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:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

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:
TWA: 100 STEL: 125 (ppm) from OSHA (PEL) [United States] TWA: 435 STEL: 545 from OSHA (PEL) [United States] TWA: 435 STEL: 545 (mg/m3) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from ACGIH (TLV) [United States] TWA: 100 STEL: 125 (ppm) [United Kingdom (UK)] TWA: 100 STEL: 125 (ppm) [Belgium] TWA: 100 STEL: 125 (ppm) [Finland] TWA: 50 (ppm) [Norway] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish. Gasoline-like. Aromatic.

Taste: Not available.

Molecular Weight: 106.16 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 136°C (276.8°F)

Melting Point: -94.9 (-138.8°F)

Critical Temperature: 617.15°C (1142.9°F)

Specific Gravity: 0.867 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.66 (Air = 1)

Volatility: 100% (v/v).

Odor Threshold: 140 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in diethyl ether. Very slightly soluble in cold water or practically insoluble in water. Soluble in all proportions in Ethyl alcohol. Soluble in Carbon tetrachloride, Benzene. Insoluble in Ammonia. Slightly soluble in Chloroform. Solubility in Water: 169 mg/l @ 25 deg. C.; 0.014 g/100 ml @ 15 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources (flames, sparks, static), incompatible materials, light

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation.

Toxicity to Animals: Acute oral toxicity (LD50): 3500 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc 50% Kill: LD50 [Rabbit] - Route: Skin; Dose: 17800 ul/kg Lowest Published Lethal Dose/Conc: LDL[Rat] - Route: Inhalation (vapor); Dose: 4000 ppm/4 H

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data. May cause cancer based on animals data. IARC evidence for carcinogenicity in animals is sufficient. IARC evidence of carcinogenicity in humans inadequate. May affect genetic material (mutagenic).

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Can cause mild skin irritation. It can be absorbed through intact skin. Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS) Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include

headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987). Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

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 3: Flammable liquid.

Identification: : Ethylbenzene UNNA: 1175 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ethylbenzene Illinois toxic substances disclosure to employee act: Ethylbenzene Illinois chemical safety act: Ethylbenzene New York release reporting list: Ethylbenzene Rhode Island RTK hazardous substances: Ethylbenzene Pennsylvania RTK: Ethylbenzene Minnesota: Ethylbenzene Massachusetts RTK: Ethylbenzene Massachusetts spill list: Ethylbenzene New Jersey: Ethylbenzene New Jersey spill list: Ethylbenzene Louisiana spill reporting: Ethylbenzene California Director's List of Hazardous Substances: Ethylbenzene TSCA 8(b) inventory: Ethylbenzene TSCA 4(a) proposed test rules: Ethylbenzene TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97 SARA 313 toxic chemical notification and release reporting: Ethylbenzene

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 B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASSE D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S29- Do not empty into drains.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

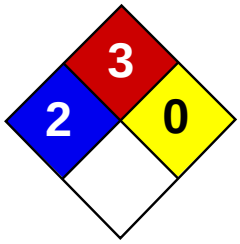
Section 16: Other Information

References:
-Manufacturer's Material Safety Data Sheet. -Fire Protection Guide to Hazardous Materials, 13th ed., National Fire Protection Association (NFPA) -Registry of Toxic Effects of Chemical Substances (RTECS) -Chemical Hazard Response Information System (CHRIS) -Hazardous Substance Data Bank (HSDB) -New Jersey Hazardous Substance Fact Sheet -Ariel Global View -Reprotext System

Other Special Considerations: Not available.

Created: 10/09/2005 05:28 PM

Last Updated: 11/06/2008 12:00 PM



Material Safety Data Sheet
Xylenes MSDS

Section 1: Chemical Product and Company Identification

Product Name: Xylenes

Catalog Codes: SLX1075, SLX1129, SLX1042, SLX1096

CAS#: 1330-20-7

RTECS: ZE2100000

TSCA: TSCA 8(b) inventory: Xylenes

CI#: Not available.

Synonym: Xylenes; Dimethylbenzene; xylol; methyltoluene

Chemical Name: Xylenes (o-, m-, p- isomers)

Chemical Formula: C6H4(CH3)2

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
Xylenes	1330-20-7	100

Toxicological Data on Ingredients: Xylenes: ORAL (LD50): Acute: 4300 mg/kg [Rat]. 2119 mg/kg [Mouse]. DERMAL (LD50): Acute: >1700 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

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. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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 if symptoms appear.

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. Seek medical attention.

Ingestion:
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 if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 464°C (867.2°F)

Flash Points: CLOSED CUP: 24°C (75.2°F). (Tagliabue.) OPEN CUP: 37.8°C (100°F).

Flammable Limits: LOWER: 1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Vapors may travel to source of ignition and flash back.

Special Remarks on Explosion Hazards:
Vapors may form explosive mixtures with air. Containers may explode when heated. May polymerize explosively when heated. An attempt to chlorinate xylene with 1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione (dichlorohydrantoin) caused a violent explosion

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined

areas; dike if needed. 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 away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. 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, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

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:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

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:
TWA: 100 (ppm) [Canada] TWA: 435 (mg/m3) [Canada] TWA: 434 STEL: 651 (mg/m3) from ACGIH (TLV) [United States] TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless. Clear

pH (1% soln/water): Not available.

Boiling Point: 138.5°C (281.3°F)

Melting Point: -47.4°C (-53.3°F)

Critical Temperature: Not available.

Specific Gravity: 0.864 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 1 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water. Miscible with absolute alcohol, ether, and many other organic liquids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Store away from acetic acid, nitric acid, chlorine, bromine, and fluorine.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2119 mg/kg [Mouse]. Acute dermal toxicity (LD50): >1700 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5000 4 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Man] - Route: Oral; Dose: 10000 ppm/6H

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in animal. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects (male and femael fertility (spontaneous abortion and fetotoxicity)) and birth defects based animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. Can be absorbed through skin. Eyes: Causes eye irritation. Inhalation: Vapor causes respiratory tract and mucous membrane irritation. May affect central nervous system and behavior (General anesthetic/CNS depressant with effects including headache, weakness, memory loss, irritability, dizziness, giddiness, loss of coordination and judgement, respiratory depression/arrest or difficulty breathing, loss of appetite, nausea, vomiting, shivering, and possible coma and death). May also affects blood, sense organs, liver, and peripheral nerves. Ingestion: May cause gastrointestinal irritation including abdominal pain, vomiting, and nausea. May also affect liver and urinary system/ kidneys. May cause effects similar to those of acute inhalation. Chronic Potential Health Effects: Chronic inhalation may affect the urinary system (kidneys) blood (anemia), bone marrow (hyperplasia of bone marrow) brain/behavior/Central Nervous system. Chronic inhalation may alsocause mucosal bleeding. Chronic ingestion may affect the liver and metabolism (loss of appetite) and may affect urinary system (kidney damage)

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 3: Flammable liquid.

Identification: : Xylenes UNNA: 1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Xylenes Illinois chemical safety act: Xylenes New York acutely hazardous substances: Xylenes Rhode Island RTK hazardous substances: Xylenes Pennsylvania RTK: Xylenes Minnesota: Xylenes Michigan critical material: Xylenes Massachusetts RTK: Xylenes Massachusetts spill list: Xylenes New Jersey: Xylenes New Jersey spill list: Xylenes Louisiana spill reporting: Xylenes California Director's List of Hazardous Substances: Xylenes TSCA 8(b) inventory: Xylenes SARA 302/304/311/312 hazardous chemicals: Xylenes SARA 313 toxic chemical notification and release reporting: Xylenes CERCLA: Hazardous substances.: Xylenes: 100 lbs. (45.36 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 B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R10- Flammable. R21- Harmful in contact with skin. R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S36/37- Wear suitable protective clothing and gloves. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 12:54 PM

Last Updated: 11/06/2008 12:00 PM

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

MATERIAL SAFETY DATA SHEET

SECTION 1 ◆ PRODUCT AND COMPANY IDENTIFICATION

Explorer Pipeline Company 6846 South Canton P.O. Box 2650 Tulsa, Oklahoma 74101	**FOR EMERGENCY SOURCE INFORMATION CONTACT:** ➢ (918) 493 - 5100 ➢ CHEMTREC: (800) 424-9300 (24 hour contact) ➢ CANUTEC: (613) 996-6666 ➢ SETIQ: 91-800-00214

TRADE NAMES/SYNONYMS: Methyl Tertiary Butyl Ether, Methyl Ether, Butyl Ether, or MTBE	**CHEMICAL FAMILY:** Alkyl Ethyl	**EPL Code:** 17

This material safety data sheet represents the composite characteristics and properties of fungible petroleum hydrocarbons and other related substances transported by explorer pipeline company. The information presented was compiled from one or more product shipper sources and is intended to provide health and safety guidance for these fungible products. Individual shipper and manufacturer MSDSs are available at Explorer Pipeline Company's, Tulsa, Oklahoma, offices.

SECTION 2 ✱ HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! EXTREMELY FLAMMABLE LIQUID

- Clear, colorless liquid with ether-like odor;
- Eye and mucous membrane irritant - effects central Nervous system - harmful or fatal if swallowed - aspiration hazard;
- High fire hazard. Keep away from heat, spark, open flame, and other ignition sources;
- Contact may cause eye, skin and mucous membrane irritation. Avoid prolonged breathing of vapors or mists;
- Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects;
- If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs); and
- Obtain prompt medical attention. Keep Out of Reach of Children!

SECTION 3 ▼ COMPOSITION/INFORMATION OF INGREDIENTS

INGREDIENT	CAS NUMBER	PERCENTAGE (%)
Methyl Tertiary Butyl Ether	1634-04-4	97+%

ACUTE

GETTING IT IN YOUR EYE...

- May cause minor eye irritation.

GETTING IT ON YOUR SKIN...

- No significant signs or symptoms indicative of any health hazard are expected to occur as a result of skin absorption exposure.
- May produce skin irritation.

SWALLOWING IT...

- The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

BREATHING IT...

- Excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

CHRONIC

- Medical information regarding special health effects is not conclusive.

CANCER, REPRODUCTIVE AND GENETIC EFFECTS

- This product has produced cancer, developmental and systemic toxicity in laboratory animals following repeated exposure. The significance of these results to human exposures has not been determined.

See Toxicological Information (Section 11) For More Information

SECTION 4 ✣ FIRST AID MEASURES

EYES: In case of eye contact, immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain emergency medical attention if pain, blinking, tears or redness persist.

SKIN: Immediately remove contaminated clothing. Wash skin thoroughly with mild soap/water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first.

INGESTION: If large quantity swallowed, give lukewarm water (pint) if victim completely conscious/alert. Do not induce vomiting/risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

INHALATION: If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.

NOTE TO PHYSICIAN: TREAT SYMPTOMATICALLY AND SUPPORTIVELY

SECTION 5 ⌘ FIRE FIGHTING MEASURES

Releases flammable vapors below normal ambient temperatures. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Flammable vapors may be heavier than air. May travel long distances along ground before igniting/flashing back to vapor source.

FLASH POINT:(Method Used) -30°F	**FLAMMABLE LIMITS:** LEL: 1.0% UEL: 8.0%

AUTOIGNITION TEMPERATURE: 797°F

EXTINGUISHING MEDIA: Dry Chemical, CO_2, Foam for Alcohols, Water spray, and fog to cool exposures

HAZARDOUS REACTIONS/DECOMPOSITION: Combustion may produce carbon monoxide, carbon dioxide, and acrid fumes. Incomplete combustion generates highly poisonous carbon monoxide and perhaps other toxic gases.

SPECIAL INSTRUCTIONS: Do not enter fire area without proper protection. Decomposition products possible. Fight fires from safe distance/protected location. Heat may build pressure/rupture closed containers, spreading fire, increasing risk of burns/injuries. Water may be ineffective due to low flash point. Even if material is water soluble, may not be practicable to extinguish fire by water dilution. Apply water spray/fog for cooling. Notify authorities if liquid enters sewer/public waters.

SECTION 6 ❖ ACCIDENTAL RELEASE MEASURES

- Flammable liquid. Release can cause fire/explosion. Liquids/vapors may ignite. Evacuate/limit access. Equip responders with proper protection. Kill all ignition sources. Stop release. Prevent flow to sewers/public waters. Notify fire/environmental authorities. Blanket with firefighting foam. Restrict water use for cleanup. Impound/recover large land spill. Soak up small spill with inert solids. Use suitable disposal containers. On water material partially soluble/may float or sink. Contain/minimize dispersion/collect. Disperse residue to reduce aquatic harm.

SECTION 7 ⚹ HANDLING AND STORAGE

Prior to working with this product workers should be trained on its proper handling and storage

- Store in tightly closed/properly vented containers away from heat/sparks/open flame/strong oxidizers. Use only non-sparking tools. Store drums with bung in up position. Carefully vent internal pressure before removing closure. Containers must be grounded before transfer. Electrical equipment should conform to National Electric Code. Handle used containers with care; residue may be flammable/explosive, unless blanketed with inert gas.
- Isolate, vent, drain, wash, and purge equipment before maintenance. Remove all ignition sources, check atmosphere for explosiveness and oxygen deficiencies. Use adequate personal protective equipment. Observe precautions pertaining to confined space entry.

SECTION 8 ⊕ EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: No special ventilation is usually required beyond that needed for normal comfort control.

OTHER HYGIENIC AND WORK PRACTICES: Emergency eye wash fountains and safety showers should be available in the immediate vicinity or any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse. Shower after work using plenty of soap and water.

EXPOSURE LIMITS

OSHA PEL		ACGIH TLV (2005)	
METHYL TERT BUTYL ETHER			
TWA	STEL	TWA	STEL
Not Applicable (N.A.)	N.A.	50 ppm	N.A.

PERSONAL PROTECTIVE EQUIPMENT

- **EYES:** Eye protection such as chemical splash goggles and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor. Contact lenses should not be worn.
- **SKIN:** Depending on the conditions of use, protective gloves, apron, boots, head and face protection should be worn. This equipment should be cleaned thoroughly after each use.
- **RESPIRATORY PROTECTION:** No occupational exposure standards have been developed for this material. Where exposure through inhalation may occur from use, NIOSH/MSHA approved respiratory protection is recommended.

SECTION 9 ϟ PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT (760 MM HG): 131°F	**PERCENT VOLATILE BY VOLUME:** 100%
SPECIFIC GRAVITY (H_2O = 1): 0.74 @ 68°F	**VISCOSITY UNITS, TEMP:** No Data
FREEZING POINT: -164°F	**VAPOR DENSITY (AIR =1):** 3.1
VAPOR PRESSURE AT 68°F: 75 mm Hg	**SOLUBILITY IN WATER:** Approximately 4% to 5%
APPEARANCE AND ODOR: Clear, colorless liquid with ether-like odor.	

SECTION 10 ¤ STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: High temperature, open flame or spark.

OTHER PHYSICAL AND CHEMICAL PROPERTIES: No Data

MATERIALS TO AVOID: Strong oxidizing agents, ungrounded electrical equipment, open flames and spark.

HAZARDOUS POLYMERIZATION: Not Expected to Occur

SECTION 11 ֍ TOXICOLOGICAL INFORMATION

METHYL TERT BUTYL ETHER (MTBE)

Acute symptoms associated with human exposure to MTBE appear to be mild and transient. Breathing small amounts of MTBE for short periods may cause nose and throat irritation. In laboratory studies, rodents exposed to high doses of MTBE exhibited blood chemistry changes and liver and kidney abnormalities.

TOXICITY

Type Of Dose	Specie	Result	Type Of Dose	Specie	Result	Type Of Dose	Specie	Result
$LD_{50(oral)}$	Mouse	3,500 mg/kg	$LC_{50(inh)}$	Mouse	35,000 ppm	$LD_{LO(oral)}$	Human	No Data Available

CARCINOGENICITY

IARC	Sufficient evidence in animals	Inadequate evidence in humans	Group 3: Possible human carcinogen
NTP	Not identified as a Know Carcinogen or Anticipated Human Carcinogen		

California (Prop 65): Listed as carcinogen	NIOSH: Not Listed	ACGIH: A3 – Confirmed Animal	OSHA: not classifiable as a human carcinogen

MUTAGENICITY, TERATOGENICITY AND REPRODUCTIVE EFFECTS

In laboratory studies, MTBE vapor exposure at the high dose concentration was associated with an increased incidence of liver tumors in female mice. Also, at high dose concentration exposures, MTBE was associated with an increased incidence of kidney and testicular (Leydig cell) tumors in male rats. There is no evidence that MTBE causes cancer in humans.

SECTION 12 ❋ ECOLOGICAL INFORMATION

ACUTE EFFECTS: MTBE is considered moderately toxicity to aquatic life. Insufficient data are available to evaluate or predict the short-term effects to birds or land animals.

CHRONIC EFFECTS: MTBE is considered moderately toxicity to aquatic life. Insufficient data are available to evaluate or predict the long-term effects to birds or land animals.

DISTRIBUTION AND PERSISTENCE IN THE ENVIRONMENT: MTBE evaporates when exposed to air. It dissolves when mixed with water. Most direct releases of MTBE to the environment are to air. MTBE also evaporates from water and soil exposed to air. Once in air, it is expected to break down to other chemicals. Because it is a liquid that does not bind well to soil, MTBE that makes its way into the ground can move through the ground and enter groundwater. Plants and animals are not likely to store methyl tertiary-butyl ether..

SECTION 13 ✣ DISPOSAL CONSIDERATIONS

Contaminated product/soil/water may be RCRA/OSHA hazardous waste due to low flash point. Use registered transporters. Dilute aqueous waste may biodegrade.

SECTION 14 ★ TRANSPORTATION INFORMATION

Not Meant To Be All Inclusive - Check Local, State, And Federal Laws And Regulations

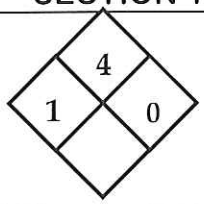
Agency	Shipping Name	Packing Group	Hazard Class	UN/NA #
U.S. DOT	Methyl tert-butyl ether	II	Flammable Liquid	UN 2398

SECTION 15 ☽ REGULATORY INFORMATION

CERCLA RQ's (40 CFR Part 302)	MTBE - 1,000 pounds
RCRA	Not Listed
SARA (40 CFR Part 355) TPQ's	None of the ingredients are listed
SARA Title III Section 313	All ingredients listed
California's Prop 65	All ingredients listed
OSHA	All ingredients are listed as hazardous under 29 CFR 1910.1200

SECTION 16 ❁ OTHER INFORMATION

NFPA 704 LABEL:



HMIS LABEL

1-4-0

MSDS REVISIONS: Change in Format and update of Information

MSDS CREATION DATE: July 1997 | **REVISION #1:** 01/03/06

DISCLAIMER

The information in this MSDS was obtained from sources which we believe are reliable. **HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS ACCURACY.** Some conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. **FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.** All product measurements such as flash point, *etc.* are considered approximate values. All data provided by Explorer Pipeline Company.

This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, such as refined petroleum hydrocarbon mixtures, this MSDS information may not be applicable.

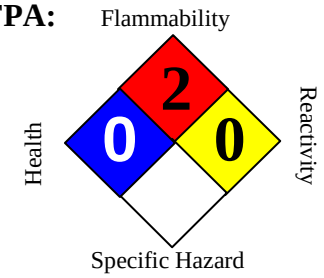
MSDS DEVELOPER: Cass Willard

Cass Willard, CIH

DATE: 01/03/06

Material Safety Data Sheet
Fuel Oil

NFPA:



SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Fuel Oil
Synonyms	:	Bunkers, Black Fuel Oil, MFO, Industrial Fuel Oil, 6 Oil, Slurry Fuel Oil, RFO, Refinery Fuel Oil, High Sulfur Fuel Oil, HSFO, IFO-30, IFO-180, IFO-380, IFO-510, IFO-700, Bunker C, Bunker Fuel Oil, Marine Fuel Oil, Decant Oil, Utility Fuel Oil, LSFO, Six Oil, 888100008793
SDS Number	:	888100008793 **Version** : 1.20
Product Use Description	:	Fuel, Intermediate Stream
Company	:	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259
Tesoro Call Center	:	(877) 783-7676 **Chemtrec (Emergency Contact)** : (800) 424-9300

SECTION 2. HAZARDS IDENTIFICATION

Classifications

Flammable Liquid – Category 4
Carcinogenicity – Category 1B
Toxic to Reproduction – Category 1B
Specific Target Organ Toxicity (Repeated Exposure) – Category 2
Acute Toxicity – Inhalation – Category 4
Acute Aquatic Toxicity– Category 3

Pictograms

Signal Word

DANGER

Hazard Statements

Combustible liquid.
May cause cancer from prolonged and repeated skin contact.
May damage fertility or the unborn child.
May cause damage to liver, kidney and nervous system through prolonged or repeated exposure.
Harmful if inhaled.
Harmful to aquatic life
Skin and eye irritant.
May contain and release toxic hydrogen sulfide (H2S) gas.

Precautionary Statements

Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from flames and hot surfaces. No smoking. Wear gloves, eye protection and face protection as needed to prevent skin and eye contact with liquid. Wash hands or liquid-contacted skin thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe vapors or mists. Use only outdoors or in a well-ventilated area
Response	In case of fire: Use dry chemical, CO2, water spray or fire fighting foam to extinguish. Get medical advice or attention if you feel unwell, are exposed, or become concerned. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin or eye irritation persists, get medical attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call or doctor or emergency medical provider
Storage	Store in a well ventilated place. Keep cool. Store locked up. Keep container tightly closed . Use only approved containers.
Disposal	Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	100%
Polycyclic aromatic compounds (PACs or PNAs)		Typically 1.5%
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8	Trace to 0.2%
Hydrogen Sulfide	7783-06-4	Trace to 0.2%
Sulfur (for waters within 25 miles of California shores)	17704-34-9	Trace to 0.1%
Sulfur (for waters within 200 miles of American shores)	17704-34-9	Trace to 1.0%
Sulfur (for International waters)	17704-34-9	Trace to 3.5%

SECTION 4. FIRST AID MEASURES

Inhalation : Move to fresh air. Give oxygen. If breathing is irregular or stopped, administer artificial respiration. Seek medical attention immediately.

Skin contact : Take off all contaminated clothing immediately. Wash off immediately with soap

		and plenty of water. Wash contaminated clothing before re-use. If skin irritation persists, call a physician.
Eye contact	:	Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, consult a specialist.
Ingestion	:	Do NOT induce vomiting. Do not give liquids. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.
Notes to physician	:	Symptoms: Dizziness, Discomfort, Headache, Nausea, Disorder, Vomiting, Liver disorders, Kidney disorders, Aspiration may cause pulmonary edema and pneumonitis.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Carbon dioxide (CO2), Water spray, Dry chemical, Foam, Keep containers and surroundings cool with water spray.
Specific hazards during fire fighting	:	Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.
Special protective equipment for fire-fighters	:	Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.
Further information	:	Flammable vapor production at ambient temperature in the open is expected to be minimal, as the material is generally wet. However, depending on oil content and conditions, it is possible flammable vapors could accumulate in the headspace of storage containers, presenting a flammability and explosion hazard. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.
Environmental precautions	:	Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material.
Methods for cleaning up	:	Take up with sand or oil absorbing materials. Carefully vacuum, shovel, scoop or sweep up into a waste container for reclamation or disposal.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling	:	Keep away from fire, sparks and heated surfaces. No smoking near areas where

material is stored or handled. The product should only be stored and handled in areas with intrinsically safe electrical classification.

Hydrocarbon liquids including this product can act as a non-conductive flammable liquid (or static accumulators), and may form ignitable vapor-air mixtures in storage tanks or other containers. Precautions to prevent static-initated fire or explosion during transfer, storage or handling, include but are not limited to these examples:

(1) Ground and bond containers during product transfers. Grounding and bonding may not be adequate protection to prevent ignition or explosion of hydrocarbon liquids and vapors that are static accumulators.
(2) Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such gasoline or naphtha).
(3) Storage tank level floats must be effectively bonded.

For more information on precautions to prevent static-initated fire or explosion, see NFPA 77, Recommended Practice on Static Electricity (2007), and API Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents (2008).

Conditions for storage, including any incompatabilities : Keep away from flame, sparks, excessive temperatures and open flame. Use approved containers. Keep containers closed and clearly labeled. Empty or partially full product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. The storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Hydrogen sulfide may accumulate in tanks and bulk transport compartments. Consider appropriate respiratory protection (see Section 8). Stand upwind. Avoid vapors when opening hatches and dome covers. Confined spaces should be ventilated and gas tested prior to entry.

Keep away from food, drink and animal feed. Incompatible with oxidizing agents. Incompatible with acids.

No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA	Polycyclic aromatic compounds (or coal tar pitch volatiles – benzene soluble)		PEL	0.2 mg/m3
	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	PEL	5 mg/m3 (as mineral oil mist)
	Hydrogen Sulfide	7783-06-4	STEL	20 ppm
ACGIH	Hydrogen Sulfide	7783-06-4	TWA	1 ppm
		7783-06-4	STEL	5 ppm

	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	TWA	0.2 mg/m3 (as mineral oil) Sum of 15 NTP-listed polynuclear aromatic hydrocarbons 0.005 mg/m3
	Polycyclic aromatic compounds (or coal tar pitch volatiles – benzene soluble)		TWA	0.2 mg/m3

Engineering measures : Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Eye protection : Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Hand protection : Gloves constructed of nitrile, neoprene, or PVC are recommended.

Skin and body protection : Chemical protective clothing such as DuPont Tyvek QC, TyChem® or equivalent, recommended based on degree of exposure. The resistance of specific material may vary from product to product as well as with degree of exposure.

Respiratory protection : If hydrogen sulfide concentration may exceed permissible exposure limit, a positive-pressure SCBA or Type C supplied air respirator with escape bottle is required as respiratory protection. If hydrogen sulfide concentration is below H2S permissible exposure limit a NIOSH/ MSHA-approved air-purifying respirator with acid gas cartridges may be acceptable for odor control, but continuous air monitoring for H2S is recommended. Protection provided by air-purifying respirators is limited. Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Work / Hygiene practices : Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Dark green to brown or black liquid

Odor Petroleum asphalt odor

Odor threshold	No data available
pH	Not applicable
Melting point/freezing point	32° - 80°C (89.6° - 176°F)
Initial boiling point & range	154 - 372 °C (310° - 702 °F)
Flash point	60°C (140°F) minimum
Evaporation rate	Higher initially and declining as lighter components evaporate
Flammability (solid, gas)	Flammable vapor released by heated liquid
Upper explosive limit	No data available
Lower explosive limit	No data available
Vapor pressure	210 Pa at 25°C
Vapor density (air = 1)	>5
Relative density (water = 1)	>0.9 to 1.2 g/mL
Solubility (in water)	6 to 1400 mg/L at 25°C
Partition coefficient (n-octanol/water)	3.4 to 5 as log Pow at 25°C
Auto-ignition temperature	>176°C (>350 °F)
Decomposition temperature	Will evaporate or boil and possibly ignite before decomposition occurs.
Kinematic viscosity	>300 cST typical at 40°C

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Vapors may form explosive mixtures with air. Hazardous polymerization does not occur.
Chemical Stability		Stable under normal conditions.
Possibility of hazardous reactions		Can react with strong oxidizing agents and peroxides. Keep away from strong acids and bases.
Conditions to avoid		Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers.
Hazardous decomposition products		Carbon monoxide, carbon dioxide and noncombusted hydrocarbons (smoke).

SECTION 11. TOXICOLOGICAL INFORMATION

Inhalation	:	Because of its low vapor pressure, this product presents a minimal inhalation hazard at ambient temperature. Upon heating, fumes may be evolved. Inhalation of fumes or mist may result in respiratory tract irritation and central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract

irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5 minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.

Skin irritation

May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. Exposure may cause a phototoxicity reaction: liquid or mist on the skin may produce a painful sunburn reaction when exposed to sunlight. Product may be hot which could cause 1st, 2nd, or 3rd degree thermal burns.

Eye irritation

May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Ingestion

This material has a low order of acute toxicity. If large quantities are ingested, nausea, vomiting and diarrhea may result. Ingestion may also cause effects similar to inhalation of the product. Could present an aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death.

Further information

This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation. The presence of carcinogenic PNAs indicates that precautions should be taken to minimize repeated and prolonged inhalation of fumes or mists. Dermal application of gas oil to rats resulted in limited evidence of liver damage (i.e., increased liver weight and changes in hepatic serum enzyme activity) and bone marrow toxicity (hypoplasia and decreased hemoglobin.) Petroleum industry experience indicates that a program providing for good personal hygiene, proper use of personal protective equipment, and minimizing the repeated and prolonged exposure to liquids and fumes, is effective in reducing or eliminating the carcinogenic risk of high boiling aromatic oils (polynuclear aromatic hydrocarbons) to humans.
Liver and kidney injuries may occur.
Components of the product may affect the nervous system.

Component:

Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	Acute oral toxicity: LD50 rat Dose: 4,320 mg/kg Acute dermal toxicity: LD50 rabbit Dose: 2,001 mg/kg Skin irritation: Classification: Irritating to skin. Result: Mild skin irritation Eye irritation: Classification: Irritating to eyes. Result: Mild eye irritation

Carcinogenicity: Animal experiments showed a statistically significant number of tumors.

Carcinogenicity

NTP	Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)
IARC	Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
CA Prop 65	WARNING! This product contains a chemical known to the State of California to cause cancer. Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)

SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

SECTION 14. TRANSPORT INFORMATION

CFR

Proper shipping name	:	Not regulated if shipped below 140°F (60°C) Elevated temperature liquid, flammable (if shipped above 140°F (60°C)).
UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	9
Packing group	:	III
Hazard inducer	:	(Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)

TDG

Proper shipping name	:	Not regulated if shipped below 140°F (60°C) Elevated temperature liquid, flammable (if shipped above 140°F (60°C)).
UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	9
Packing group	:	III
Hazard inducer	:	(Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)

IATA Cargo Transport

UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	Not regulated if shipped below 140°F (60°c) Not permitted for transport (at 140°F (60°C) or higher temperature) 9

IATA Passenger Transport

UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	Not regulated if shipped below 140°F (60°c) Not permitted for transport (at 140°F (60°C) or higher temperature) 9

IMDG-Code

UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Description of the goods	:	Elevated temperature liquid, n.o.s. (Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)
Class	:	Not regulated if shipped below 140°F (60°c) Not permitted for transport (at 140°F (60°C) or higher temperature) 9
Packaging group	:	III
IMDG-Labels	:	9
EmS Number	:	F-A S-P
Marine pollutant	:	No

SECTION 15. REGULATORY INFORMATION

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIROMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil. Fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

TSCA Status	:	On TSCA Inventory
DSL Status	:	All components of this product are on the Canadian DSL list.
SARA 311/312 Hazards	:	Fire Hazard Acute Health Hazard Chronic Health Hazard

SARA III — US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

Components	CAS-No.
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

SARA III — US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR355, Appendix A)

Components	CAS-No.

PENN RTK — US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Components	CAS-No.
Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

MASS RTK — US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Components	CAS-No.
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Components	CAS-No.
Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

California Prop. 65 : WARNING! This product contains a chemical known in the State of California to cause cancer.

Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

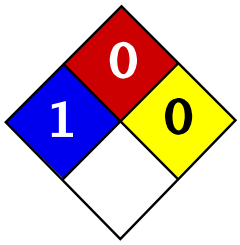
SECTION 16. OTHER INFORMATION

Further information

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.

Revision Date : 07/26/2012

65, 66, 121, 295, 296, 347, 1003, 1006, 1007, 1009, 1010, 1022, 1054, 1083, 1084, 1085, 1089, 1586, 1886



Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

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
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator).
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage.

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. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. 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 away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust 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:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States]
TWA: 0.05 (mg/m3) from OSHA (PEL) [United States]
TWA: 0.03 (mg/m3) from NIOSH [United States]
TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials.
Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential:
Skin:
Lead metal granules or dust: May cause skin irritation by mechanical action.
Lead metal foil, shot or sheets: Not likely to cause skin irritation
Eyes:
Lead metal granules or dust: Can irritate eyes by mechanical action.

Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation.
Inhalation:
In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes.
Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death.
Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count.
Ingestion:
Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases.
Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

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: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to

cause reproductive harm (male) which would require a warning under the statute: Lead
California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead
Connecticut hazardous material survey.: Lead
Illinois toxic substances disclosure to employee act: Lead
Illinois chemical safety act: Lead
New York release reporting list: Lead
Rhode Island RTK hazardous substances: Lead
Pennsylvania RTK: Lead

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).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed.
R33- Danger of cumulative effects.
R61- May cause harm to the unborn child.
R62- Possible risk of impaired fertility.
S36/37- Wear suitable protective clothing and gloves.
S44- If you feel unwell, seek medical advice (show the label when possible).
S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Safety glasses.

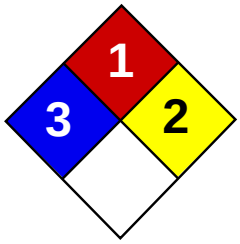
Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 11/06/2008 12:00 PM



Health	3
Fire	1
Reactivity	2
Personal Protection	E

Material Safety Data Sheet
Arsenic MSDS

Section 1: Chemical Product and Company Identification

Product Name: Arsenic

Catalog Codes: SLA1006

CAS#: 7440-38-2

RTECS: CG0525000

TSCA: TSCA 8(b) inventory: Arsenic

CI#: Not applicable.

Synonym:

Chemical Name: Arsenic

Chemical Formula: As

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
Arsenic	7440-38-2	100

Toxicological Data on Ingredients: Arsenic: ORAL (LD50): Acute: 763 mg/kg [Rat]. 145 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, lungs, the nervous system, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

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. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

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. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. 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 away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust 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:
TWA: 0.01 from ACGIH (TLV) [United States] [1995] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 74.92 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: Not available.

Melting Point: Sublimation temperature: 615°C (1139°F)

Critical Temperature: Not available.

Specific Gravity: 5.72 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 145 mg/kg [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. Causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

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 as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Arsenic UNNA: UN1558 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Arsenic California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Arsenic Pennsylvania RTK: Arsenic Massachusetts RTK: Arsenic TSCA 8(b) inventory: Arsenic

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R22- Harmful if swallowed. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

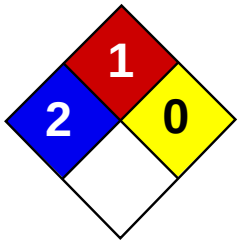
Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -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.

Created: 10/09/2005 04:16 PM

Last Updated: 11/06/2008 12:00 PM



Material Safety Data Sheet
Copper MSDS

Section 1: Chemical Product and Company Identification

Product Name: Copper

Catalog Codes: SLC4939, SLC2152, SLC3943, SLC1150, SLC2941, SLC4729, SLC1936, SLC3727, SLC5515

CAS#: 7440-50-8

RTECS: GL5325000

TSCA: TSCA 8(b) inventory: Copper

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Cu

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
Copper	7440-50-8	100

Toxicological Data on Ingredients: Copper LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. 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 away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust 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:
TWA: 1 (mg/m3) from ACGIH [1990] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 63.54 g/mole

Color: Not available.

pH (1% soln/water): Not applicable.

Boiling Point: 2595°C (4703°F)

Melting Point: 1083°C (1981.4°F)

Critical Temperature: Not available.

Specific Gravity: 8.94 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Human: passes through the placenta, excreted in maternal milk.

Special Remarks on other Toxic Effects on Humans: Not available.

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 as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Copper Massachusetts RTK: Copper TSCA 8(b) inventory: Copper CERCLA: Hazardous substances.: Copper

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC): R36- Irritating to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 04:58 PM

Last Updated: 11/06/2008 12:00 PM

MATERIAL SAFETY DATA SHEET

Date Printed: 05/17/2006
Date Updated: 01/28/2006
Version 1.4

Section 1 - Product and Company Information

Product Name	10.00 G ZINC FIXANAL AS ZINC SULFATE
Product Number	38950
Brand	RIEDEL
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ZINC STANDARD CONCENTRATE	None	No

Ingredient Name	CAS #	Percent	SARA 313
WATER	7732-18-5	84	No
ZINC SULFATE HEPTAHYDRATE	7446-20-0	16	Yes

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Dangerous for the environment. Harmful.
Harmful if swallowed. Irritating to eyes and skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Target organ(s): Liver. Kidneys.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult,

call a physician.

DERMAL EXPOSURE
In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

METHODS FOR CLEANING UP
Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Respiratory protection is not required. Where protection is desired, use multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges.
Hand: Protective gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance Physical State: Liquid

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Zinc/zinc oxides, Sulfur oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Kidneys. Pancreas. Liver. Lungs.

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s.
UN#: 3082
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA
Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
IATA UN Number: 3082
Hazard Class: 9
Packing Group: III

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: Xi-N
Indication of Danger: Irritant. Dangerous for the environment.
R: 41-50/53
Risk Statements: Risk of serious damage to eyes. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S: 26-39-61
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear eye/face protection. Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Dangerous for the environment. Harmful.
Risk Statements: Harmful if swallowed. Irritating to eyes and skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Statements: Avoid contact with eyes. Wear suitable protective clothing. Avoid release to the environment. Refer to special instructions/safety data sheets.
US Statements: Target organ(s): Liver. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: No
NDSL: No

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

APPENDIX C

Roux Health and Safety Lessons Learned /
Accident Report Forms

☐ **Roux Environmental Engineering and Geology, D.P.C.**
☐ **Roux Associates, Inc.** ☐ **Remedial Engineering, P.C.**
(Check applicable company name)

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) ☐ Final (5-10 days)
Date: _____ 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
☐Restricted Work ☐Lost Time Treatment

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.)

☐Decommissioning	☐Geoprobe	☐Sampling
☐Demolition	☐Motor Vehicle	☐System Start-up
☐Dewatering	☐Operations/	☐Trenching
☐Drilling	Maintenance	☐AST/UST Removal
☐Excavation	☐Pump/Pilot Test	☐Other_____
☐Gauging	☐Rigging/Lifting	

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)				

No One Gets Hurt!

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

CONCLUSION: WHY IT HAPPENED (LIST CAUSAL FACTORS AND CORRESPONDING ROOT CAUSES)

(Root Causes: Lack of knowledge or skill, Doing the task according to procedures or acceptable practices takes more time or effort, Short-cuts or not following acceptable practices is reinforced or tolerated, Not following procedures or acceptable practices did not result in an accident, Lack of or inadequate procedures, Inadequate communications of expectations regarding procedures or acceptable practices, Inadequate tools or equipment, External Factors)

ROOT CAUSE(S) AND SOLUTION(S): HOW TO PREVENT INCIDENT FROM RECURRING

PERSONAL FACTORS:

A. LACK OF SKILL OR KNOWLEDGE

B. DOING THE JOB ACCORDING TO PROCEDURES OR ACCEPTABLE PRACTICES TAKES MORE TIME OR EFFORT

C. SHORT-CUTTING PROCEDURES OR ACCEPTABLE PRACTICES IS POSITIVELY REINFORCED OR TOLERATED

D. IN PAST, DID NOT FOLLOW PROCEDURES OR ACCEPTABLE PRACTICES AND NO INCIDENT OCCURRED

JOB FACTORS:

E. LACK OF OR INADEQUATE PROCEDURES

F. INADEQUATE COMMUNICATION OF EXPECTATIONS REGARDING PROCEDURES OR ACCEPTABLE STANDARDS

G. INADEQUATE TOOLS OR EQUIPMENT (available, maintained, etc.)

CAUSAL FACTOR / BEHAVIOR / CONDITION	ROOT CAUSE	SOLUTION(S) [Must Match Root Cause(s)]		PERSON RESPONSIBLE	AGREED DUE DATE	ACTUAL COMPLETION DATE
		#	Solution(s)			

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 D

Health and Safety Briefing /
Meeting Log and Daily Site Safety Checklist

HEALTH AND SAFETY BRIEFING / TAILGATE MEETING FORM

Site Name / Location _____

Date: _____ Weather Forecast: _____

Names of Personnel Attending Briefing

_____ _____ _____

_____ _____ _____

_____ _____ _____

Planned Work

_____

_____

_____

Instrument Calibration: Instrument/Time/Cal. Gas/Cal. Concentration/Actual Concentration

_____

_____

_____

Items Discussed

_____

_____

_____

_____

_____

Work Permit Type and Applicable Restrictions

_____

_____

_____

Signatures of Attending Personnel

_____ _____ _____

_____ _____ _____

_____ _____ _____

APPENDIX E

Roux 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. (Roux Associates) 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 F

Roux Subsurface Utility Clearance Procedure

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. (Roux Associates) 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 Associates employees, its contractors and subcontractors. Employees are expected to follow this program for all intrusive work involving Roux Associates or other personnel (e.g., contractors/subcontractors) working for Roux Associates 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 Associates 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 Associates personnel shall notify the facility owner/operator and the one call center. All incidents such as this will be reported as per Roux Associates' 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 Associates 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.				

Key reminders for execution:

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: _____

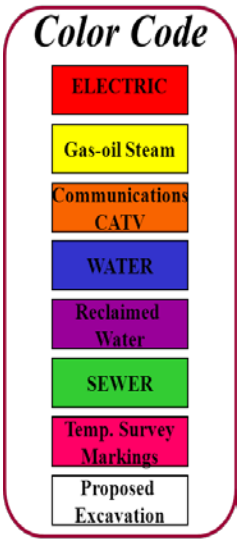
Date: _____

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 G

ACORD® Automobile Loss Notice Form

AUTOMOBILE LOSS NOTICE

DATE (MM/DD/YYYY)

AGENCY	INSURED LOCATION CODE	DATE OF LOSS AND TIME	AM / PM
AJ Gallagher Risk Management Services 377 Oak Street Garden City, NY 11530			
CONTACT NAME: Teresa Garzia	CARRIER: Great Divide Insurance Company		NAIC CODE: 25224
PHONE (A/C, No, Ext): 516.622.2418	POLICY NUMBER: BAP154979912		
FAX (A/C, No):	POLICY TYPE: Commercial Automobile		
E-MAIL ADDRESS:			
CODE:	SUBCODE:		
AGENCY CUSTOMER ID: ROUXASS-01			

INSURED

NAME OF INSURED (First, Middle, Last)			INSURED'S MAILING ADDRESS
Roux Assiciates, Inc.			209 Shafter Street Islandia, NY 11749
DATE OF BIRTH	FEIN (if applicable): 11-2579482	MARITAL STATUS / CIVIL UNION (if applicable)	
PRIMARY PHONE #: ☐ HOME ☒ BUS ☐ CELL 631.232.2600	SECONDARY PHONE #: ☐ HOME ☐ BUS ☐ CELL		PRIMARY E-MAIL ADDRESS: legaldept@rouxinc.com SECONDARY E-MAIL ADDRESS: Fax Notice of Loss to: 631.232.1525

CONTACT ☐ CONTACT INSURED

NAME OF CONTACT (First, Middle, Last)		CONTACT'S MAILING ADDRESS
Cindy Albanese		Cindy Albanese 209 Shafter Street Islandia, NY 11749
PRIMARY PHONE #: ☐ HOME ☐ BUS ☐ CELL	SECONDARY PHONE #: ☐ HOME ☐ BUS ☐ CELL	
WHEN TO CONTACT		PRIMARY E-MAIL ADDRESS: legaldept@rouxinc.com SECONDARY E-MAIL ADDRESS: Fax Notice of Loss to 631.232.1525

LOSS

LOCATION OF LOSS	POLICE OR FIRE DEPARTMENT CONTACTED
STREET:	
CITY, STATE, ZIP:	REPORT NUMBER
COUNTRY:	

DESCRIBE LOCATION OF LOSS IF NOT AT SPECIFIC STREET ADDRESS:

DESCRIPTION OF ACCIDENT (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

INSURED VEHICLE

VEH #	YEAR	MAKE	BODY TYPE	PLATE NUMBER	STATE
		MODEL:	V.I.N.:		

OWNER'S NAME AND ADDRESS ☐ (Check if same as insured)	PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL	SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL
	PRIMARY E-MAIL ADDRESS:	
	SECONDARY E-MAIL ADDRESS:	
DRIVER'S NAME AND ADDRESS ☐ (Check if same as owner)	PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL	SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL
	PRIMARY E-MAIL ADDRESS:	
	SECONDARY E-MAIL ADDRESS:	

RELATION TO INSURED (Employee, family, etc.)	DATE OF BIRTH	DRIVER'S LICENSE NUMBER	STATE	PURPOSE OF USE	USED WITH PERMISSION? (Y/N)

DESCRIBE DAMAGE

1. WAS A STANDARD CHILD PASSENGER RESTRAINT SYSTEM (CHILD SEAT) INSTALLED IN THE VEHICLE AT THE TIME OF THE ACCIDENT?	Y/N
2. WAS THE CHILD PASSENGER RESTRAINT SYSTEM (CHILD SEAT) IN USE BY A CHILD DURING THE TIME OF THE ACCIDENT?	Y/N
3. DID THE CHILD PASSENGER RESTRAINT SYSTEM (CHILD SEAT) SUSTAIN A LOSS AT THE TIME OF THE ACCIDENT?	Y/N

ESTIMATE AMOUNT:	WHERE CAN VEHICLE BE SEEN?:	WHEN CAN VEHICLE BE SEEN?:
OTHER INSURANCE ON VEHICLE - CARRIER:		POLICY NUMBER:

OTHER VEHICLE / PROPERTY DAMAGED

NON - VEHICLE? ☐ AGENCY CUSTOMER ID: _____

VEH #	YEAR	MAKE:	BODY TYPE:	PLATE NUMBER	STATE
		MODEL:	V.I.N.:		

DESCRIBE PROPERTY (Other Than Vehicle) | OTHER VEH/PROP INS? (Y/N) ☐

CARRIER OR AGENCY NAME | NAIC CODE | POLICY NUMBER

OWNER'S NAME AND ADDRESS

PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL | SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL

PRIMARY E-MAIL ADDRESS:

SECONDARY E-MAIL ADDRESS:

DRIVER'S NAME AND ADDRESS ☐ (Check if same as owner)

PRIMARY PHONE # ☐ HOME ☐ BUS ☐ CELL | SECONDARY PHONE # ☐ HOME ☐ BUS ☐ CELL

PRIMARY E-MAIL ADDRESS:

SECONDARY E-MAIL ADDRESS:

DESCRIBE DAMAGE

ESTIMATE AMOUNT | WHERE CAN DAMAGE BE SEEN?

INJURED

NAME & ADDRESS	PHONE (A/C, No)	PED	INS VEH	OTH VEH	AGE	EXTENT OF INJURY
		☐	☐	☐		
		☐	☐	☐		
		☐	☐	☐		
		☐	☐	☐		

WITNESSES OR PASSENGERS

NAME & ADDRESS	PHONE (A/C, No)	INS VEH	OTH VEH	OTHER (Specify)
		☐	☐	
		☐	☐	
		☐	☐	

REPORTED BY | REPORTED TO

REMARKS (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

APPLICABLE IN ALABAMA

Any person who knowingly presents a false or fraudulent claim for payment of a loss or benefit or who knowingly presents false information in an application for insurance is guilty of a crime and may be subject to restitution fines or confinement in prison, or any combination thereof.

APPLICABLE IN ALASKA

A person who knowingly and with intent to injure, defraud, or deceive an insurance company files a claim containing false, incomplete, or misleading information may be prosecuted under state law.

APPLICABLE IN ARIZONA

For your protection, Arizona law requires the following statement to appear on this form. Any person who knowingly presents a false or fraudulent claim for payment of a loss is subject to criminal and civil penalties.

APPLICABLE IN ARKANSAS, DELAWARE, KENTUCKY, LOUISIANA, MAINE, MICHIGAN, NEW JERSEY, NEW MEXICO, NORTH DAKOTA, PENNSYLVANIA, RHODE ISLAND, SOUTH DAKOTA, TENNESSEE, TEXAS, VIRGINIA, AND WEST VIRGINIA

Any person who knowingly and with intent to defraud any insurance company or another person, files a statement of claim containing any materially false information, or conceals for the purpose of misleading, information concerning any fact, material thereto, commits a fraudulent insurance act, which is a crime, subject to criminal prosecution and civil penalties. In LA, ME, TN, and VA, insurance benefits may also be denied.

APPLICABLE IN CALIFORNIA

For your protection, California law requires the following to appear on this form: Any person who knowingly presents a false or fraudulent claim for payment of a loss is guilty of a crime and may be subject to fines and confinement in state prison.

APPLICABLE IN COLORADO

It is unlawful to knowingly provide false, incomplete, or misleading facts or information to an insurance company for the purpose of defrauding or attempting to defraud the company. Penalties may include imprisonment, fines, denial of insurance, and civil damages. Any insurance company or agent of an insurance company who knowingly provides false, incomplete, or misleading facts or information to a policy holder or claimant for the purpose of defrauding or attempting to defraud the policy holder or claimant with regard to a settlement or award payable from insurance proceeds shall be reported to the Colorado Division of Insurance within the Department of Regulatory Agencies.

APPLICABLE IN THE DISTRICT OF COLUMBIA

Warning: It is a crime to provide false or misleading information to an insurer for the purpose of defrauding the insurer or any other person. Penalties include imprisonment and/or fines. In addition, an insurer may deny insurance benefits, if false information materially related to a claim was provided by the applicant.

APPLICABLE IN FLORIDA

Pursuant to S. 817.234, Florida Statutes, any person who, with the intent to injure, defraud, or deceive any insurer or insured, prepares, presents, or causes to be presented a proof of loss or estimate of cost or repair of damaged property in support of a claim under an insurance policy knowing that the proof of loss or estimate of claim or repairs contains any false, incomplete, or misleading information concerning any fact or thing material to the claim commits a felony of the third degree, punishable as provided in S. 775.082, S. 775.083, or S. 775.084, Florida Statutes.

APPLICABLE IN HAWAII

For your protection, Hawaii law requires you to be informed that presenting a fraudulent claim for payment of a loss or benefit is a crime punishable by fines or imprisonment, or both.

APPLICABLE IN IDAHO

Any person who knowingly and with the intent to injure, defraud, or deceive any insurance company files a statement of claim containing any false, incomplete or misleading information is guilty of a felony.

APPLICABLE IN INDIANA

A person who knowingly and with intent to defraud an insurer files a statement of claim containing any false, incomplete, or misleading information commits a felony.

APPLICABLE IN KANSAS

Any person who, knowingly and with intent to defraud, presents, causes to be presented or prepares with knowledge or belief that it will be presented to or by an insurer, purported insurer, broker or any agent thereof, any written statement as part of, or in support of, an application for the issuance of, or the rating of an insurance policy for personal or commercial insurance, or a claim for payment or other benefit pursuant to an insurance policy for commercial or personal insurance which such person knows to contain materially false information concerning any fact material thereto; or conceals, for the purpose of misleading, information concerning any fact material thereto commits a fraudulent insurance act.

APPLICABLE IN MARYLAND

Any person who knowingly or willfully presents a false or fraudulent claim for payment of a loss or benefit or who knowingly or willfully presents false information in an application for insurance is guilty of a crime and may be subject to fines and confinement in prison.

APPLICABLE IN MINNESOTA

A person who files a claim with intent to defraud or helps commit a fraud against an insurer is guilty of a crime.

APPLICABLE IN NEVADA

Pursuant to NRS 686A.291, any person who knowingly and willfully files a statement of claim that contains any false, incomplete or misleading information concerning a material fact is guilty of a felony.

APPLICABLE IN NEW HAMPSHIRE

Any person who, with purpose to injure, defraud or deceive any insurance company, files a statement of claim containing any false, incomplete or misleading information is subject to prosecution and punishment for insurance fraud, as provided in RSA 638:20.

APPLICABLE IN NEW YORK

Any person who knowingly and with intent to defraud any insurance company or other person files an application for commercial insurance or a statement of claim for any commercial or personal insurance benefits containing any materially false information, or conceals for the purpose of misleading, information concerning any fact material thereto, and any person who in connection with such application or claim knowingly makes or knowingly assists, abets, solicits or conspires with another to make a false report of the theft, destruction, damage or conversion of any motor vehicle to a law enforcement agency, the Department of Motor Vehicles or an insurance company, commits a fraudulent insurance act, which is a crime, and shall also be subject to a civil penalty not to exceed five thousand dollars and the value of the subject motor vehicle or stated claim for each violation.

APPLICABLE IN OHIO

Any person who, with intent to defraud or knowing that he/she is facilitating a fraud against an insurer, submits an application or files a claim containing a false or deceptive statement is guilty of insurance fraud.

APPLICABLE IN OKLAHOMA

WARNING: Any person who knowingly and with intent to injure, defraud or deceive any insurer, makes any claim for the proceeds of an insurance policy containing any false, incomplete or misleading information is guilty of a felony.

APPLICABLE IN WASHINGTON

It is a crime to knowingly provide false, incomplete, or misleading information to an insurance company for the purpose of defrauding the company. Penalties include imprisonment, fines and denial of insurance benefits.

APPENDIX H

Job Safety and Health Protection Poster

U.S. Department of Labor

OSHA®
Occupational Safety and Health Administration

Job Safety and Health
IT'S THE LAW!

All workers have the right to:

- A safe workplace.
- Raise a safety or health concern with your employer or OSHA, or report a work-related injury or illness, without being retaliated against.
- Receive information and training on job hazards, including all hazardous substances in your workplace.
- Request an OSHA inspection of your workplace if you believe there are unsafe or unhealthy conditions. OSHA will keep your name confidential. You have the right to have a representative contact OSHA on your behalf.
- Participate (or have your representative participate) in an OSHA inspection and speak in private to the inspector.
- File a complaint with OSHA within 30 days (by phone, online or by mail) if you have been retaliated against for using your rights.
- See any OSHA citations issued to your employer.
- Request copies of your medical records, tests that measure hazards in the workplace, and the workplace injury and illness log.

This poster is available free from OSHA.

Employers must:

- Provide employees a workplace free from recognized hazards. It is illegal to retaliate against an employee for using any of their rights under the law, including raising a health and safety concern with you or with OSHA, or reporting a work-related injury or illness.
- Comply with all applicable OSHA standards.
- Report to OSHA all work-related fatalities within 8 hours, and all inpatient hospitalizations, amputations and losses of an eye within 24 hours.
- Provide required training to all workers in a language and vocabulary they can understand.
- Prominently display this poster in the workplace.
- Post OSHA citations at or near the place of the alleged violations.

FREE ASSISTANCE to identify and correct hazards is available to small and medium-sized employers, without citation or penalty, through OSHA-supported consultation programs in every state.

Contact OSHA. We can help.

1-800-321-OSHA (6742) • TTY 1-877-889-5627 • www.osha.gov

OSHA 3165-04R 2015

APPENDIX I

Community Air Monitoring Plan (CAMP)

Community Air Monitoring Plan

1221 Spofford Avenue
Tax Lot 35 of Tax Block 2738
Bronx, New York

September 17, 2018

Prepared for:

THE PENINSULA JV, LLC
111 8th Avenue
New York, New York 10011

Prepared by:

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

2611.0002Y.121/CAMPCV

Table of Contents

Table

Appendix

1. INTRODUCTION

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of Peninsula JV, LLC, (the "Volunteer"), have developed a project specific Community Air Monitoring Plan (CAMP) to implement real time monitoring at 1221 Spofford Avenue (Site) during remedial construction activities.

The monitoring program will be implemented at all times during which earth disturbance activities are occurring. The CAMP is designed to provide a measure of protection for the downwind community and onsite workers not directly involved with the subject work activities from potential airborne contaminant releases as a direct result of remedial and construction activities. This plan is consistent with the New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan guidance document.

The specifics of the CAMP are presented in the following four (4) sections:

- 1.1 VOC Monitoring Approach
- 1.2 Particulate Monitoring Approach
- 1.3 Meteorological Monitoring Approach
- 1.4 Available Suppression Techniques

1.1 VOC Monitoring Approach

Total VOC concentrations in air will be monitored continuously at a location downwind of the excavation activities during all ground intrusive activities. An upwind monitoring station will be set up adjacent to where the excavation is occurring. The VOC monitoring equipment will be located at temporary monitoring stations that will be established daily based on Site logistics and weather conditions. The monitoring work will be conducted using MiniRAE 3000 (or equivalent) portable VOC monitors, or similar type monitors, for all VOC monitoring. The equipment will be calibrated at least once daily using isobutylene as the calibration gas. One (1) upwind and one (1) downwind monitor will be deployed each day. Each monitoring unit is equipped with an audible alarm to indicate exceedance of the action levels (as defined below and summarized in Table 1).

The equipment is capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total VOCs at the downwind perimeter of the Site exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If the ambient air concentration of total VOCs at the downwind perimeter of the Site persists at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of VOCs identified, suppression techniques employed to abate emissions, and monitoring continued. After these steps, work activities can resume if the total organic vapor level at the Site perimeter is below 5 ppm over the background concentration for the 15-minute average. If levels are in excess of 25 ppm above background, identified contributing ground-intrusive activities will be halted and vapor suppression techniques will be evaluated and modified until monitoring indicates VOC levels at the Site perimeter are below 5 ppm over background. Once VOC levels are below 5 ppm at the Site perimeter, work will resume with continued monitoring.

All 15-minute readings will be recorded and be available for State Regulator (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will be recorded. If an exceedance of the action level occurs, an Action Limit Report (ALR) will be completed, identifying the monitoring device location, the measured VOC level, the activity causing the exceedance, meteorological conditions, and the corrective actions taken, as provided in Appendix A. Additionally, the NYSDEC and NYSDOH will be notified within 24 hours of the VOC ALR generation. Daily monitoring equipment locations and meteorological conditions will also be documented on the daily CAMP Monitoring Location Plan. All documentation will be kept on file at the Site.

1.2 Particulate Monitoring, Response Levels and Actions

Particulate concentrations will be monitored continuously at temporary particulate monitoring stations set up at the sidewalk at upwind and downwind locations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action levels (as defined below and summarized in Table 1). Monitoring equipment will be MIE Data Ram monitors or equivalent. A minimum of one (1) upwind and one (1) downwind monitor will be deployed each day, equipped with an omni-directional sampling inlet and a PM-10 sample head. The data logging averaging period will be set to 15-minutes with time and date stamp recording. Alarm averaging will be set at 90 micrograms per cubic meter (µg/m^3) per 15-minute period. This setting will allow proactive evaluation of Site conditions prior to reaching Action Levels of 100 µg/m^3 above background. The equipment will be outfitted with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. The monitoring will be used to compare values to the following:

- If the downwind PM-10 particulate level is 100 µg/m^3 greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the Site, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 µg/m^3 above the upwind level and provided that no visible dust is migrating from the Site.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 µg/m^3 above the upwind level, work must be stopped, a re-evaluation of activities initiated, and dust suppression techniques modified. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m^3 of the upwind level and in preventing visible dust migration.

All 15-minute readings will be recorded and will be available for State Regulator (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will be recorded. If an exceedance of the action level occurs, an ALR will be completed, identifying the monitoring device location, the measured particulate concentration, the activity causing the exceedance, meteorological conditions, and the corrective actions taken, as provided in Appendix A. Daily monitoring equipment locations will also be documented on the daily CAMP Monitoring Location Plan. All documentation will be kept on file at the Site.

1.3 Meteorological Monitoring

Wind speed (estimated) and wind direction, will be approximated based on field observations of onsite personnel. Meteorological data consisting of temperature, barometric pressure, and relative humidity will be recorded in the field book based upon publicly available information from local weather stations.

1.4 Available Suppression Techniques

Odor Control

Due to the nature of the project, with excavation occurring, the potential for generation of nuisance odors and the need for odor control may be necessary. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project.

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

Dust Control

Due to the nature of the project, the potential for generation of nuisance dust and the need for dust control may be necessary. Dust suppression will be achieved through the use of water for wetting excavation areas, if required. Water will be available on-site at suitable supply and pressure for use in dust control.

1.5 Reporting

All recorded monitoring data will be downloaded and field logged periodically, including action limit reports (if any) and daily CAMP monitoring location plans. All records will be maintained onsite and available for NYSDEC/NYSDOH review. A summary of CAMP findings, including excursions, will be provided in the Daily and Monthly Reports. All CAMP monitoring records will be included in the overall Final Engineering Report that will be submitted to the NYSDEC and NYSDOH and will include all of the CAMP data collected, daily monitoring station location maps, and copies of the ALRs (if any). If an ALR is generated due to VOC exceedances, the NYSDEC and NYSDOH will be notified within 24 hours of the exceedance.

TABLE

1. Action Limit Summary for VOCs and Particulates

Table 1. Action Limit Summary for VOCs and Particulates, Peninsula Redevelopment Project, 1221 Spofford Avenue, Bronx, NY

Contaminant	Downwind Action Levels*	Action/Response
Volatile Organic Compounds (VOCs) (Monitoring Via Photoionization Detector and Odor Observation)	< 5 ppm	1. Resume work with continuing monitoring.
	5 ppm < level < 25 ppm	1. Work activities must be temporarily halted, source vapors must be identified, suppression techniques employed to abate emissions and monitoring continued. 2. After these steps, if VOC levels (200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or structure, whichever is less) is below 5 ppm over background, resume work.
	> 25 ppm	1. Identified contributing ground intrusive activities must be halted and vapor suppression techniques must be evaluated and modified until monitoring indicates VOC levels below the action level. 2. After these steps, if VOC levels (half the distance to the nearest potential receptor or structure) are below 5 ppm over background, resume work.
Particulates (Monitoring Via Particulate Meter and Observation)	< 100 ug/m^3	1. If dust is observed leaving the work area, then dust control techniques must be implemented or additional controls used.
	100 ug/m3 < level < 150 ug/m^3	1. Employ dust suppression techniques. 2. Work may continue with dust suppression techniques provided that downwind PM-10 particulate concentration do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
	> 150 ug/m^3	1. STOP work 2. Re-evaluate activities, modify dust suppression techniques. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m^3 of the upwind level and in preventing visible dust migration.

* Instantaneous readings above background. Particulate readings are based on the respirable (PM-10) fraction. Background readings are taken at upwind locations relative to Work Areas or Exclusion Zones.

APPENDIX

A. Action Limit Report

ACTION LIMIT REPORT

Project Location: Peninsula Redevelopment Project, 1221 Spofford Avenue, Bronx, NY

Date: _____ Time: _____

Name: _____

Contaminant: PM-10: _____ VOC: _____

Wind Speed: _____ Wind Direction: _____

Temperature: _____ Barometric Pressure: _____

DOWNWIND DATA

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

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

UPWIND DATA

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

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

BACKGROUND CORRECTED LEVELS

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

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

ACTIVITY DESCRIPTION

CORRECTIVE ACTION TAKEN

APPENDIX D

Quality Assurance Project Plan

Quality Assurance Project Plan

The Peninsula
NYSDEC BCP Site No. C203097
1221 Spofford Avenue
Tax Lot 35 of Tax Block 2738
Bronx, New York

September 17, 2018

Prepared for:

The Peninsula JV, LLC
111 8th Avenue
New York, New York 10011

Prepared by:

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

2611.0002Y121.QAPP/CV

Table of Contents

Tables

Appendices

1. INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared to describe the measures that will be taken to ensure that the data generated during performance of the Remedial Action (RA) at the Peninsula Redevelopment Project site, located at 1221 Spofford Avenue, Bronx, New York (Site) are of quality sufficient to meet project-specific data quality objectives (DQOs).

The Peninsula Redevelopment Project (Project) consists of the demolition of the former Spofford Juvenile Detention Center and ACS Child Care Center. These facilities will be replaced with a vibrant live-work campus known as The Peninsula. The Peninsula includes the construction of a vibrant live-work campus featuring affordable housing, community space, open/recreational space, industrial space, and retail space. The entire Site encompasses an area of approximately 3.78 acres, which has been investigated, and will be remediated and redeveloped under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP).

Peninsula JV, LLC is a Volunteer in the BCP. RA activities will be conducted under the New York State Department of Environmental Conservation (NYSDEC) BCP and in accordance with the NYSDEC-approved Remedial Action Work Plan (RAWP). The QAPP was prepared in accordance with the guidance provided in NYSDEC Technical Guidance DER-10 (Technical Guidance for Site Investigation and Remediation), the BCP Guide and the United States Environmental Protection Agency's (USEPA's) Guidance for the Data Quality Objectives Process (EPA QA/G-4). This QAPP provides guidelines and procedures to be followed by field personnel during performance of the endpoint/sidewall sampling. Information contained in this QAPP relates to:

- Sampling objectives (Section 2);
- Project organization (Section 3);
- Sample media, sampling locations, analytical suites, sampling frequencies, and analytical laboratory (Section 4);
- Field sampling procedures (Section 5);
- Sample handling, sample analysis, and quality assurance/quality control (Section 6); and
- Site control procedures and decontamination (Section 7).

2. SAMPLING OBJECTIVES

The proposed RA includes excavations for removal of petroleum-contaminated soil and historical fill that exceeds the site-specific cleanup criteria. The proposed excavation area are provided on Plate 4 of the RAWP. If, and to the extent that, grossly contaminated soil is encountered during the RA activities, excavations will continue to remove the grossly contaminated soil to the extent it is technically and practically feasible.

Roux Environmental Engineering and Geology, D.P.C (Roux) has developed a scope of work for this RA that includes post-excavation soil endpoint and sidewall sampling during completion for the RA. The post-excavation sampling program is designed to meet the data quality objectives (DQOs) set forth in the DER-10. Specifically, sampling frequency and analytical parameters selected for each sample, as described in Section 4, are comprehensive and are intended to demonstrate that the contamination has been removed, to the extent technically and practically feasible.

Sampling procedures are discussed in Section 5 of this QAPP. A discussion of the DQOs and quality assurance/quality control (QA/QC) for the project is provided in Section 6.

3. PROJECT ORGANIZATION

A general and generic summary of the overall management structure and responsibilities of project team members are presented below. Professional profiles are presented in Appendix A.

Project Principal

Frank Cherena 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 RA.

Project Manager

Jeffrey Wills 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.

Quality Assurance Officer (QAO)

Dana Hignell of Roux will serve as QAO. The QAO will review sampling procedures and certify that the data was collected and analyzed using the appropriate procedures. This individual will provide coordination with the analytical laboratory and the data validator to resolve any problems.

Field Analyst

The Field Analyst will be determined prior to the start of the Work. The Field Analyst bears the responsibility for the successful execution of the field program. The Field Analyst will direct the activities of the technical staff in the field, as well as all subcontractors. The Field Analyst also assists in the interpretation of data and in report preparation. The Field Analyst reports to the Project Manager.

Laboratory Project Manager

The Laboratory Project Manager will be determined prior to the start of the Work. 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 that an acceptable laboratory report is prepared and submitted. The Laboratory Project Manager reports to the Field Analyst. The laboratory selected for the RA activities is TestAmerica Laboratories, Inc. of Edison, New Jersey (TestAmerica).

Data Validator

Judy Harry of Data Validation Services will serve as the Data Validator. The Data Validator is responsible for validation of any sampling data as required by the NYSDEC and preparation of the Data Usability Summary Report (DUSR) in accordance with Appendix 2B of DER-10.

4. SAMPLE MEDIA, LOCATIONS, ANALYTICAL SUITES, AND FREQUENCY

The media to be sampled during the implementation of the RA is soil. Analytical suites and frequency for soil sampling (endpoint and sidewall samples) are provided below and summarized in Table 1. Specifics regarding the collection of soil samples are provided in Sections 5 and 6 of this QAPP.

In accordance with DER 10, endpoint samples will be collected at a frequency of one sample per 900 feet squared (ft^2) of excavate area and sidewall samples will be collected at a frequency of one sample per 30 linear feet of sidewall occurrence for excavations with perimeters between 20 and 300 feet (minimum of one sample per sidewall), and one sidewall sample per 100 linear feet of sidewall occurrence for excavations with perimeters greater than 300 feet. All soil samples will be analyzed for the following:

- Target compound list (TCL) volatile organic compounds (VOCs) by the United Stated Environmental Protection Agency (USEPA) Method 8260;
- TCL Semivolatile organic compounds (SVOCs) by USEPA Method 8270;
- TCL pesticides by USEPA Method 8081A;
- Polychlorinated Biphenyls (PCBs) by USEPA Method 8082A; and
- Target analyte list (TAL) metals, including mercury, by USEPA Method 6010/7471.

QA/QC samples, including field duplicate, matric spike/matrix spike duplicate (MS/MSD) and field blank samples, will be collected at a frequency of one QA/QC sample per 20 endpoint/sidewall samples. Trip blank samples will be submitted for analysis each day VOC are to be analyzed for soil samples.

Laboratory analyses will be performed by a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory in accordance with the NYSDEC Analytical Services Protocol (ASP) using USEPA SW-846 Methods. The ELAP-certified laboratory for the RA activities is TestAmerica.

5. FIELD SAMPLING PROCEDURES

This section provides a discussion of the field procedures to be used for sampling of soil during implementation of the RA.

The post-excavation soil samples will be collected as discrete soil samples using pre-cleaned stainless-steel sampling tools (i.e., trowels, spatulas, etc.) or the excavator bucket at all proposed endpoint/sidewall sample locations. Areas that appear more heavily impacted, if any, will be given sampling preference. Samples will be labeled based on each area's designation.

Additional details regarding soil-sampling protocols are described in Roux's Standard Operating Procedures (SOP), which are provided in Appendix B.

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 quality assurance/quality control.

6.1 Field Sample Handling

A detailed 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 4.0 and in Table 1 of this QAPP. The types of containers, volumes, holding times, and preservation techniques for the aforementioned testing parameters are presented in Table 2.

6.2 Sample Custody Documentation

The purpose of documenting sample custody is to ensure that 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 portion, if applicable). Specific procedures regarding sample tracking from the field to the laboratory are described in Roux's SOP for Sample Handling (Attachment 1).

Each individual collecting a sample 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 field work and to decide if additional samples are required.

All samples being shipped off-Site for analysis must be accompanied by a properly completed laboratory 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 and/or to/from a secure storage area and/or to the shipper, and/or 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

Sample packaging and shipping procedures are based upon USEPA specifications, as well as U.S. Department of Transportation (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. Additional information regarding sample handling is provided in Roux's SOP for Sample Handling (Attachment 1).

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 that 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 approximately at the bottom of the cooler to act as a cushion for the sample containers.
6. Arrange containers in the cooler so that 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 Zip-lock™ 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 Zip-lock™ 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

The primary intended use for the RA data is to demonstrate that the soil cleanup objectives for the Site have been met. The primary DQO of the soil sampling, therefore, is that data be accurate and precise, and hence 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 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 RA field and quality control sampling summary. Table 3 lists the preservation, holding times and sample container information. Table 4 shows the reporting limits and minimum detection limits achievable by the laboratory.

All soil sample analyses will be performed in accordance with the NYSDEC ASP, using USEPA SW-846 methods.

All endpoint/sidewall soil data are to be reported in NYSDEC ASP Category B deliverables. All endpoint/sidewall soil data will be validated by a third-party validator and a Data Usability Summary Report (DUSR) will be prepared.

A QA glossary is presented in Appendix C.

7. SITE CONTROL PROCEDURES

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. In order to accomplish this objective, the QAPP addresses three main considerations:

- The establishment of discrete work zones in the RA area;
- The decontamination of field equipment; and
- The disposal of all RA-derived waste.

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 the consultant's and/or contractor's Site-Specific Health and Safety Plan (HASP), which is included as Appendix 2 of the RAWP.

7.1 Field Work Zones

Field work zones will be limited to areas where excavation, stockpiling, and soil sampling is being conducted. Access to these areas will be limited in accordance with the HASP. Control of work zone access will be the responsibility of the individual(s) designated as a Site Health and Safety Manager. At the completion of each working day, all loose equipment (e.g., sampling equipment, coolers, etc.) will be secured. Heavy equipment, such as the excavator, will remain on-Site within an established, secured zone.

7.2 Decontamination

In an attempt to avoid the spread of contamination, all excavation and sampling equipment must be decontaminated at a reasonable frequency. Sampling equipment will be decontaminated prior to use, following collection at each sample location and upon completion of the sampling activities. Temporary decontamination pads will be set up by the contractor as deemed necessary. Detailed procedures for the decontamination of field and sampling equipment are included in the attached Roux's SOPs (Appendix B). The location of the decontamination area(s) will be determined as necessary during the field operations. The decontamination area will be constructed to ensure that any wash water generated during decontamination can be collected. Decontamination water (if any) will be disposed of along with additional construction wastewaters, in accordance with the RAWP.

7.3 Waste Handling and Disposal

All impacted soil excavated from the Site and other RA-derived waste will be transported and disposed of off-Site, in accordance with all applicable federal, state, and local regulations. The RA-derived waste that will be generated during the construction activities include:

- Impacted soil from the Site (non-hazardous);
- Personal Protective Equipment (PPE); and
- Construction wastewater from decontamination, if any is generated.

Haul vehicles for bulk soil will be secured with appropriate covers prior to exiting the construction area to prevent release of waste.

PPE generated during the implementation of the RA will be consolidated and stored in appropriate bulk containers (drums, etc.), and temporarily staged at a designated waste storage area. Any full or partially filled containers will be appropriately labeled after the completion of the work.

Construction and decontamination water, if any, will be collected and disposed of along with all other wastewater generated.

TABLES

Table 1. Field and Laboratory QC Summary

QC Check Type	Minimum Frequency	Use
Field QC		
Duplicate	1 per matrix per 20 samples or SD	Precision
Trip Blank	1 per VOC cooler	Sensitivity
Field Blank	1 per matrix per 20 samples	Sensitivity
Laboratory QC		
Laboratory Control Sample	1 per matrix per SDG	Accuracy
Matrix Spike/Matrix Spike Duplicate/Matrix Duplica	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. Remedial Action Field and Quality Control 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
Soil , Post Excavation	TCL VOCs	100	5	20	5	5	5	140
	TCL SVOCs	100	5	NA	5	5	5	120
	TCL Pesticides	100	5	NA	5	5	5	120
	TCL PCBs	100	5	NA	5	5	5	120
	TAL Metals	100	5	NA	5	5	5	120

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 or 1 per Sample Delivery Group (3 days max)

[2] Based on 1 cooler per day

NA - Not Applicable

PCBs - Polychlorinated Biphenols

SVOCs - Semivolatile Organic Compounds

TAL - USEPA Contract Laboratory Program Target Analyte List

TCL - USEPA Contract Laboratory Program Target Compound List

VOCs - Volatile Organic Compounds

Table 3. Preservation, Holding Times and Sample Containers

Analysis	Method	Matrix	Bottle Type	Preservation(a)	Holding Time(b)
TCL Volatile Organic Compounds (VOCs)	SW-846 8260C	Soil	1 - 1 Vial MeOH/2 Vial Water (via Encore)	Cool to 4°C Hydrochloric Acid to a ph<2	14 days from sample collection
TCL Semivolatile Organic Compounds (SVOCs)	SW-846 8270D	Soil	8 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis
TAL Metals	SW-846 6010/7471	Soil	8 oz wide mouth glass	Cool to 4°C	6 months, except mercury (28 days)
Pesticide and Polychlorinated Biphenols (PCB)	SW-846 8081A/8082	Soil	4 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days for analysis

(a) All soil and groundwater samples to be preserved in ice during collection and transport

(b) Days from date of sample collection.

TAL - Target Analyte List

TCL - USEPA Contract Laboratory Program Target Compound List

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 1

Roux Associates, Inc.
TCL-SOIL
METALS by 6010C (SOIL)

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria	Holding Time	Container
Aluminum, Total	7429-90-5	4	1.08	mg/kg	48-151		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Antimony, Total	7440-36-0	2	0.152	mg/kg	1-208		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Arsenic, Total	7440-38-2	0.4	0.0832	mg/kg	79-121		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Barium, Total	7440-39-3	0.4	0.0696	mg/kg	83-117		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Beryllium, Total	7440-41-7	0.2	0.0132	mg/kg	83-117		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Cadmium, Total	7440-43-9	0.4	0.0392	mg/kg	83-117		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Calcium, Total	7440-70-2	4	1.4	mg/kg	81-119		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Chromium, Total	7440-47-3	0.4	0.0384	mg/kg	80-120		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Cobalt, Total	7440-48-4	0.8	0.0664	mg/kg	84-115		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Copper, Total	7440-50-8	0.4	0.1032	mg/kg	81-118		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Iron, Total	7439-89-6	2	0.3612	mg/kg	45-155		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Lead, Total	7439-92-1	2	0.1072	mg/kg	81-117		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Magnesium, Total	7439-95-4	4	0.616	mg/kg	76-124		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Manganese, Total	7439-96-5	0.4	0.0636	mg/kg	81-117		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Nickel, Total	7440-02-0	1	0.0968	mg/kg	83-117		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Potassium, Total	7440-09-7	100	5.76	mg/kg	71-129		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Selenium, Total	7782-49-2	0.8	0.1032	mg/kg	78-122		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Silver, Total	7440-22-4	0.4	0.1132	mg/kg	75-124		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Sodium, Total	7440-23-5	80	1.26	mg/kg	72-127		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Thallium, Total	7440-28-0	0.8	0.126	mg/kg	80-120		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Vanadium, Total	7440-62-2	0.4	0.0812	mg/kg	78-122		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved
Zinc, Total	7440-66-6	2	0.1172	mg/kg	82-118		75-125	20	20		180 days	1 - Metals Only-Glass 60mL/2oz unpreserved

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 1

Roux Associates, Inc.
TCL-SOIL
METALS by 7471B (SOIL)

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria	Holding Time	Container
Mercury, Total	7439-97-6	0.08	0.016896	mg/kg	72-128		80-120	20	20		28 days	1 - Metals Only-Glass 60mL/2oz unpreserved

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 1

Roux Associates, Inc.
TCL-SOIL
TCL Pesticides - EPA 8081B (SOIL)

Holding Time: 14 days
Container / Sample Preservation: 1 - Glass 250ml/8oz unpreserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Delta-BHC	319-86-8	7.9992	1.56651	ug/kg	30-150	30	30-150	50	50			
Lindane	58-89-9	3.333	1.489851	ug/kg	30-150	30	30-150	50	50			
Alpha-BHC	319-84-6	3.333	0.946572	ug/kg	30-150	30	30-150	50	50			
Beta-BHC	319-85-7	7.9992	3.03303	ug/kg	30-150	30	30-150	50	50			
Heptachlor	76-44-8	3.9996	1.793154	ug/kg	30-150	30	30-150	50	50			
Aldrin	309-00-2	7.9992	2.816385	ug/kg	30-150	30	30-150	50	50			
Heptachlor epoxide	1024-57-3	14.9985	4.49955	ug/kg	30-150	30	30-150	50	50			
Endrin	72-20-8	3.333	1.36653	ug/kg	30-150	30	30-150	50	50			
Endrin aldehyde	7421-93-4	9.999	3.49965	ug/kg	30-150	30	30-150	50	50			
Endrin ketone	53494-70-5	7.9992	2.059794	ug/kg	30-150	30	30-150	50	50			
Dieldrin	60-57-1	4.9995	2.49975	ug/kg	30-150	30	30-150	50	50			
4,4'-DDE	72-55-9	7.9992	1.849815	ug/kg	30-150	30	30-150	50	50			
4,4'-DDD	72-54-8	7.9992	2.853048	ug/kg	30-150	30	30-150	50	50			
4,4'-DDT	50-29-3	14.9985	6.43269	ug/kg	30-150	30	30-150	50	50			
Endosulfan I	959-98-8	7.9992	1.889811	ug/kg	30-150	30	30-150	50	50			
Endosulfan II	33213-65-9	7.9992	2.673066	ug/kg	30-150	30	30-150	50	50			
Endosulfan sulfate	1031-07-8	3.333	1.523181	ug/kg	30-150	30	30-150	50	50			
Methoxychlor	72-43-5	14.9985	4.6662	ug/kg	30-150	30	30-150	50	50			
Toxaphene	8001-35-2	149.985	41.9958	ug/kg	30-150	30	30-150	50	50			
cis-Chlordane	5103-71-9	9.999	2.786388	ug/kg	30-150	30	30-150	50	50			
trans-Chlordane	5103-74-2	9.999	2.639736	ug/kg	30-150	30	30-150	50	50			
Chlordane	57-74-9	64.9935	26.49735	ug/kg	30-150	30	30-150	50	50			
2,4,5,6-Tetrachloro-m-xylene	*877-09-8*									*30-150*		
Decachlorobiphenyl	*2051-24-3*									*30-150*		

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 1

Roux Associates, Inc.
TCL-SOIL
TCL Volatiles - EPA 8260C/5035 High&Low (SOIL)

Holding Time: 14 days
Container/Sample Preservation: 1 - 1 Vial MeOH/2 Vial Water

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Methylene chloride	75-09-2	10	1.65	ug/kg	70-130	30	70-130	30	30			
1,1-Dichloroethane	75-34-3	1.5	0.27	ug/kg	70-130	30	70-130	30	30			
Chloroform	67-66-3	1.5	0.37	ug/kg	70-130	30	70-130	30	30			
Carbon tetrachloride	56-23-5	1	0.345	ug/kg	70-130	30	70-130	30	30			
1,2-Dichloropropane	78-87-5	3.5	0.228	ug/kg	70-130	30	70-130	30	30			
Dibromochloromethane	124-48-1	1	0.176	ug/kg	70-130	30	70-130	30	30			
1,1,2-Trichloroethane	79-00-5	1.5	0.313	ug/kg	70-130	30	70-130	30	30			
Tetrachloroethene	127-18-4	1	0.302	ug/kg	70-130	30	70-130	30	30			
Chlorobenzene	108-90-7	1	0.348	ug/kg	70-130	30	70-130	30	30			
Trichlorofluoromethane	75-69-4	5	0.417	ug/kg	70-139	30	70-139	30	30			
1,2-Dichloroethane	107-06-2	1	0.246	ug/kg	70-130	30	70-130	30	30			
1,1,1-Trichloroethane	71-55-6	1	0.35	ug/kg	70-130	30	70-130	30	30			
Bromodichloromethane	75-27-4	1	0.308	ug/kg	70-130	30	70-130	30	30			
trans-1,3-Dichloropropene	10061-02-6	1	0.208	ug/kg	70-130	30	70-130	30	30			
cis-1,3-Dichloropropene	10061-01-5	1	0.231	ug/kg	70-130	30	70-130	30	30			
1,3-Dichloropropene, Total	542-75-6	1	0.208	ug/kg				30	30			
1,3-Dichloropropene, Total	542-75-6	1	0.208	ug/kg				30	30			
1,1-Dichloropropene	563-58-6	5	0.328	ug/kg	70-130	30	70-130	30	30			
Bromoform	75-25-2	4	0.237	ug/kg	70-130	30	70-130	30	30			
1,1,2,2-Tetrachloroethane	79-34-5	1	0.298	ug/kg	70-130	30	70-130	30	30			
Benzene	71-43-2	1	0.193	ug/kg	70-130	30	70-130	30	30			
Toluene	108-88-3	1.5	0.195	ug/kg	70-130	30	70-130	30	30			
Ethylbenzene	100-41-4	1	0.17	ug/kg	70-130	30	70-130	30	30			
Chloromethane	74-87-3	5	0.436	ug/kg	52-130	30	52-130	30	30			
Bromomethane	74-83-9	2	0.338	ug/kg	57-147	30	57-147	30	30			
Vinyl chloride	75-01-4	2	0.315	ug/kg	67-130	30	67-130	30	30			
Chloroethane	75-00-3	2	0.316	ug/kg	50-151	30	50-151	30	30			
1,1-Dichloroethene	75-35-4	1	0.372	ug/kg	65-135	30	65-135	30	30			
trans-1,2-Dichloroethene	156-60-5	1.5	0.241	ug/kg	70-130	30	70-130	30	30			
Trichloroethene	79-01-6	1	0.302	ug/kg	70-130	30	70-130	30	30			
1,2-Dichlorobenzene	95-50-1	5	0.182	ug/kg	70-130	30	70-130	30	30			
1,3-Dichlorobenzene	541-73-1	5	0.218	ug/kg	70-130	30	70-130	30	30			
1,4-Dichlorobenzene	106-46-7	5	0.182	ug/kg	70-130	30	70-130	30	30			
Methyl tert butyl ether	1634-04-4	2	0.153	ug/kg	66-130	30	66-130	30	30			
p/m-Xylene	179601-23-1	2	0.351	ug/kg	70-130	30	70-130	30	30			
o-Xylene	95-47-6	2	0.338	ug/kg	70-130	30	70-130	30	30			
Xylene (Total)	1330-20-7	2	0.338	ug/kg				30	30			
Xylene (Total)	1330-20-7	2	0.338	ug/kg				30	30			
cis-1,2-Dichloroethene	156-59-2	1	0.342	ug/kg	70-130	30	70-130	30	30			
1,2-Dichloroethene (total)	540-59-0	1	0.241	ug/kg				30	30			
1,2-Dichloroethene (total)	540-59-0	1	0.241	ug/kg				30	30			
Dibromomethane	74-95-3	10	0.239	ug/kg	70-130	30	70-130	30	30			

Please Note that the RL information provided in this table is calculated using a 100% Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Roux Associates, Inc.
TCL-SOIL
TCL Volatiles - EPA 8260C/5035 High&Low (SOIL)

Holding Time: 14 days
Container/Sample Preservation: 1 - 1 Vial MeOH/2 Vial Water

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Styrene	100-42-5	2	0.401	ug/kg	70-130	30	70-130	30	30			
Dichlorodifluoromethane	75-71-8	10	0.5	ug/kg	30-146	30	30-146	30	30			
Acetone	67-64-1	10	2.29	ug/kg	54-140	30	54-140	30	30			
Carbon disulfide	75-15-0	10	1.1	ug/kg	59-130	30	59-130	30	30			
2-Butanone	78-93-3	10	0.69	ug/kg	70-130	30	70-130	30	30			
Vinyl acetate	108-05-4	10	0.153	ug/kg	70-130	30	70-130	30	30			
4-Methyl-2-pentanone	108-10-1	10	0.244	ug/kg	70-130	30	70-130	30	30			
1,2,3-Trichloropropane	96-18-4	10	0.177	ug/kg	68-130	30	68-130	30	30			
2-Hexanone	591-78-6	10	0.666	ug/kg	70-130	30	70-130	30	30			
Bromochloromethane	74-97-5	5	0.357	ug/kg	70-130	30	70-130	30	30			
2,2-Dichloropropane	594-20-7	5	0.45	ug/kg	70-130	30	70-130	30	30			
1,2-Dibromoethane	106-93-4	4	0.199	ug/kg	70-130	30	70-130	30	30			
1,3-Dichloropropane	142-28-9	5	0.183	ug/kg	69-130	30	69-130	30	30			
1,1,1,2-Tetrachloroethane	630-20-6	1	0.318	ug/kg	70-130	30	70-130	30	30			
Bromobenzene	108-86-1	5	0.219	ug/kg	70-130	30	70-130	30	30			
n-Butylbenzene	104-51-8	1	0.228	ug/kg	70-130	30	70-130	30	30			
sec-Butylbenzene	135-98-8	1	0.217	ug/kg	70-130	30	70-130	30	30			
tert-Butylbenzene	98-06-6	5	0.247	ug/kg	70-130	30	70-130	30	30			
o-Chlorotoluene	95-49-8	5	0.221	ug/kg	70-130	30	70-130	30	30			
p-Chlorotoluene	106-43-4	5	0.183	ug/kg	70-130	30	70-130	30	30			
1,2-Dibromo-3-chloropropane	96-12-8	5	0.396	ug/kg	68-130	30	68-130	30	30			
Hexachlorobutadiene	87-68-3	5	0.348	ug/kg	67-130	30	67-130	30	30			
Isopropylbenzene	98-82-8	1	0.194	ug/kg	70-130	30	70-130	30	30			
p-Isopropyltoluene	99-87-6	1	0.202	ug/kg	70-130	30	70-130	30	30			
Naphthalene	91-20-3	5	0.138	ug/kg	70-130	30	70-130	30	30			
Acrylonitrile	107-13-1	10	0.514	ug/kg	70-130	30	70-130	30	30			
n-Propylbenzene	103-65-1	1	0.215	ug/kg	70-130	30	70-130	30	30			
1,2,3-Trichlorobenzene	87-61-6	5	0.251	ug/kg	70-130	30	70-130	30	30			
1,2,4-Trichlorobenzene	120-82-1	5	0.215	ug/kg	70-130	30	70-130	30	30			
1,3,5-Trimethylbenzene	108-67-8	5	0.161	ug/kg	70-130	30	70-130	30	30			
1,2,4-Trimethylbenzene	95-63-6	5	0.186	ug/kg	70-130	30	70-130	30	30			
1,4-Dioxane	123-91-1	40	14.4	ug/kg	65-136	30	65-136	30	30			
1,4-Diethylbenzene	105-05-5	4	4	ug/kg	70-130	30	70-130	30	30			
4-Ethyltoluene	622-96-8	4	0.234	ug/kg	70-130	30	70-130	30	30			
1,2,4,5-Tetramethylbenzene	95-93-2	4	0.156	ug/kg	70-130	30	70-130	30	30			
Ethyl ether	60-29-7	5	0.26	ug/kg	67-130	30	67-130	30	30			
trans-1,4-Dichloro-2-butene	110-57-6	5	0.392	ug/kg	70-130	30	70-130	30	30			
1,2-Dichloroethane-d4	*17060-07-0*									*70-130*		
2-Chloroethoxyethane												
Toluene-d8	*2037-26-5*									*70-130*		
4-Bromofluorobenzene	*460-00-4*									*70-130*		
Dibromofluoromethane	*1868-53-7*									*70-130*		

Please Note that the RL information provided in this table is calculated using a 100% Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 3

Roux Associates, Inc.
TCL-SOIL
TCL Volatiles - EPA 8260C/5035 High&Low (SOIL)

Holding Time: 14 days
Container/Sample Preservation: 1 - 1 Vial MeOH/2 Vial Water

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		

Please Note that the RL information provided in this table is calculated using a 100% Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 1

Roux Associates, Inc.
TCL-SOIL
NYTCL Semivolatiles - EPA 8270D (SOIL)

Holding Time: 14 days
Container / Sample Preservation: 1 - Glass 250ml/8oz unpreserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Acenaphthene	83-32-9	0.1332	0.0172494	mg/kg	31-137	50	31-137	50	50			
1,2,4-Trichlorobenzene	120-82-1	0.1665	0.0190476	mg/kg	38-107	50	38-107	50	50			
Hexachlorobenzene	118-74-1	0.0999	0.018648	mg/kg	40-140	50	40-140	50	50			
Bis(2-chloroethyl)ether	111-44-4	0.14985	0.0225774	mg/kg	40-140	50	40-140	50	50			
2-Chloronaphthalene	91-58-7	0.1665	0.0165168	mg/kg	40-140	50	40-140	50	50			
1,2-Dichlorobenzene	95-50-1	0.1665	0.0299034	mg/kg	40-140	50	40-140	50	50			
1,3-Dichlorobenzene	541-73-1	0.1665	0.028638	mg/kg	40-140	50	40-140	50	50			
1,4-Dichlorobenzene	106-46-7	0.1665	0.0290709	mg/kg	28-104	50	28-104	50	50			
3,3'-Dichlorobenzidine	91-94-1	0.1665	0.044289	mg/kg	40-140	50	40-140	50	50			
2,4-Dinitrotoluene	121-14-2	0.1665	0.0333	mg/kg	28-89	50	28-89	50	50			
2,6-Dinitrotoluene	606-20-2	0.1665	0.0285714	mg/kg	40-140	50	40-140	50	50			
Fluoranthene	206-44-0	0.0999	0.0191142	mg/kg	40-140	50	40-140	50	50			
4-Chlorophenyl phenyl ether	7005-72-3	0.1665	0.0178155	mg/kg	40-140	50	40-140	50	50			
4-Bromophenyl phenyl ether	101-55-3	0.1665	0.0254079	mg/kg	40-140	50	40-140	50	50			
Bis(2-chloroisopropyl)ether	108-60-1	0.1998	0.0284382	mg/kg	40-140	50	40-140	50	50			
Bis(2-chloroethoxy)methane	111-91-1	0.17982	0.0166833	mg/kg	40-117	50	40-117	50	50			
Hexachlorobutadiene	87-68-3	0.1665	0.0243756	mg/kg	40-140	50	40-140	50	50			
Hexachlorocyclopentadiene	77-47-4	0.47619	0.150849	mg/kg	40-140	50	40-140	50	50			
Hexachloroethane	67-72-1	0.1332	0.0269397	mg/kg	40-140	50	40-140	50	50			
Isophorone	78-59-1	0.14985	0.0216117	mg/kg	40-140	50	40-140	50	50			
Naphthalene	91-20-3	0.1665	0.0202797	mg/kg	40-140	50	40-140	50	50			
Nitrobenzene	98-95-3	0.14985	0.024642	mg/kg	40-140	50	40-140	50	50			
NitrosoDiPhenylAmine(NDPA)/DPA	86-30-6	0.1332	0.0189477	mg/kg	36-157	50	36-157	50	50			
n-Nitrosodi-n-propylamine	621-64-7	0.1665	0.0257076	mg/kg	32-121	50	32-121	50	50			
Bis(2-Ethylhexyl)phthalate	117-81-7	0.1665	0.057609	mg/kg	40-140	50	40-140	50	50			
Butyl benzyl phthalate	85-68-7	0.1665	0.041958	mg/kg	40-140	50	40-140	50	50			
Di-n-butylphthalate	84-74-2	0.1665	0.0315684	mg/kg	40-140	50	40-140	50	50			
Di-n-octylphthalate	117-84-0	0.1665	0.05661	mg/kg	40-140	50	40-140	50	50			
Diethyl phthalate	84-66-2	0.1665	0.0154179	mg/kg	40-140	50	40-140	50	50			
Dimethyl phthalate	131-11-3	0.1665	0.034965	mg/kg	40-140	50	40-140	50	50			
Benzo(a)anthracene	56-55-3	0.0999	0.0187479	mg/kg	40-140	50	40-140	50	50			
Benzo(a)pyrene	50-32-8	0.1332	0.040626	mg/kg	40-140	50	40-140	50	50			
Benzo(b)fluoranthene	205-99-2	0.0999	0.0280386	mg/kg	40-140	50	40-140	50	50			
Benzo(k)fluoranthene	207-08-9	0.0999	0.02664	mg/kg	40-140	50	40-140	50	50			
Chrysene	218-01-9	0.0999	0.017316	mg/kg	40-140	50	40-140	50	50			
Acenaphthylene	208-96-8	0.1332	0.0257076	mg/kg	40-140	50	40-140	50	50			
Anthracene	120-12-7	0.0999	0.0324675	mg/kg	40-140	50	40-140	50	50			
Benzo(ghi)perylene	191-24-2	0.1332	0.0195804	mg/kg	40-140	50	40-140	50	50			
Fluorene	86-73-7	0.1665	0.0161838	mg/kg	40-140	50	40-140	50	50			
Phenanthrene	85-01-8	0.0999	0.0202464	mg/kg	40-140	50	40-140	50	50			
Dibenzo(a,h)anthracene	53-70-3	0.0999	0.0192474	mg/kg	40-140	50	40-140	50	50			
Indeno(1,2,3-cd)Pyrene	193-39-5	0.1332	0.0232101	mg/kg	40-140	50	40-140	50	50			

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Roux Associates, Inc.
TCL-SOIL
NYTCL Semivolatiles - EPA 8270D (SOIL)

Holding Time: 14 days
Container / Sample Preservation: 1 - Glass 250ml/8oz unpreserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Pyrene	129-00-0	0.0999	0.0165501	mg/kg	35-142	50	35-142	50	50			
Biphenyl	92-52-4	0.37962	0.038628	mg/kg	54-104	50	54-104	50	50			
4-Chloroaniline	106-47-8	0.1665	0.030303	mg/kg	40-140	50	40-140	50	50			
2-Nitroaniline	88-74-4	0.1665	0.0321012	mg/kg	47-134	50	47-134	50	50			
3-Nitroaniline	99-09-2	0.1665	0.0314019	mg/kg	26-129	50	26-129	50	50			
4-Nitroaniline	100-01-6	0.1665	0.068931	mg/kg	41-125	50	41-125	50	50			
Dibenzofuran	132-64-9	0.1665	0.0157509	mg/kg	40-140	50	40-140	50	50			
2-Methylnaphthalene	91-57-6	0.1998	0.0201132	mg/kg	40-140	50	40-140	50	50			
1,2,4,5-Tetrachlorobenzene	95-94-3	0.1665	0.0173826	mg/kg	40-117	50	40-117	50	50			
Acetophenone	98-86-2	0.1665	0.0206127	mg/kg	14-144	50	14-144	50	50			
2,4,6-Trichlorophenol	88-06-2	0.0999	0.0315684	mg/kg	30-130	50	30-130	50	50			
P-Chloro-M-Cresol	59-50-7	0.1665	0.0248085	mg/kg	26-103	50	26-103	50	50			
2-Chlorophenol	95-57-8	0.1665	0.0196803	mg/kg	25-102	50	25-102	50	50			
2,4-Dichlorophenol	120-83-2	0.14985	0.0267732	mg/kg	30-130	50	30-130	50	50			
2,4-Dimethylphenol	105-67-9	0.1665	0.054945	mg/kg	30-130	50	30-130	50	50			
2-Nitrophenol	88-75-5	0.35964	0.062604	mg/kg	30-130	50	30-130	50	50			
4-Nitrophenol	100-02-7	0.2331	0.067932	mg/kg	11-114	50	11-114	50	50			
2,4-Dinitrophenol	51-28-5	0.7992	0.077589	mg/kg	4-130	50	4-130	50	50			
4,6-Dinitro-o-cresol	534-52-1	0.4329	0.07992	mg/kg	10-130	50	10-130	50	50			
Pentachlorophenol	87-86-5	0.1332	0.03663	mg/kg	17-109	50	17-109	50	50			
Phenol	108-95-2	0.1665	0.0251415	mg/kg	26-90	50	26-90	50	50			
2-Methylphenol	95-48-7	0.1665	0.0258075	mg/kg	30-130.	50	30-130.	50	50			
3-Methylphenol/4-Methylphenol	106-44-5	0.23976	0.0260739	mg/kg	30-130	50	30-130	50	50			
2,4,5-Trichlorophenol	95-95-4	0.1665	0.0319014	mg/kg	30-130	50	30-130	50	50			
Benzoic Acid	65-85-0	0.53946	0.168498	mg/kg	10-110	50	10-110	50	50			
Benzyl Alcohol	100-51-6	0.1665	0.050949	mg/kg	40-140	50	40-140	50	50			
Carbazole	86-74-8	0.1665	0.0161838	mg/kg	54-128	50	54-128	50	50			
2-Fluorophenol	*367-12-4*									*25-120*		
Phenol-d6	*13127-88-3*									*10-120*		
Nitrobenzene-d5	*4165-60-0*									*23-120*		
2-Fluorobiphenyl	*321-60-8*									*30-120*		
2,4,6-Tribromophenol	*118-79-6*									*10-136*		
4-Terphenyl-d14	*1718-51-0*									*18-120*		

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1

Roux Associates, Inc.
TCL-SOIL
Herbicides -EPA 8151A (SOIL)

Holding Time: 14 days
Container / Sample Preservation: 1 - Glass 250ml/8oz unpreserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
2,4-D	94-75-7	166.5	10.4895	ug/kg	30-150	30	30-150	30	30			
2,4,5-T	93-76-5	166.5	5.1615	ug/kg	30-150	30	30-150	30	30			
2,4,5-TP (Silvex)	93-72-1	166.5	4.4289	ug/kg	30-150	30	30-150	30	30			
DCAA	*19719-28-9*									*30-150*		

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 1

Roux Associates, Inc.
TCL-SOIL
TCL PCBs - EPA 8082A (SOIL)

Holding Time: 14 days
Container / Sample Preservation: 1 - Glass 250ml/8oz unpreserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Aroclor 1016	12674-11-2	33.5	2.6465	ug/kg	40-140	50	40-140	50	50			
Aroclor 1221	11104-28-2	33.5	3.0887	ug/kg	40-140	50	40-140	50	50			
Aroclor 1232	11141-16-5	33.5	3.9262	ug/kg	40-140	50	40-140	50	50			
Aroclor 1242	53469-21-9	33.5	4.1004	ug/kg	40-140	50	40-140	50	50			
Aroclor 1248	12672-29-6	33.5	2.8274	ug/kg	40-140	50	40-140	50	50			
Aroclor 1254	11097-69-1	33.5	2.7537	ug/kg	40-140	50	40-140	50	50			
Aroclor 1260	11096-82-5	33.5	2.5527	ug/kg	40-140	50	40-140	50	50			
Aroclor 1262	37324-23-5	33.5	1.6616	ug/kg	40-140	50	40-140	50	50			
Aroclor 1268	11100-14-4	33.5	4.8575	ug/kg	40-140	50	40-140	50	50			
PCBs, Total	1336-36-3	33.5	1.6616	ug/kg				50	50			
PCBs, Total	1336-36-3	33.5	1.6616	ug/kg				50	50			
2,4,5,6-Tetrachloro-m-xylene	*877-09-8*									*30-150*		
Decachlorobiphenyl	*2051-24-3*									*30-150*		

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

Date Created: 06/15/17
Created By: Karyn Raymond
File: PM3678-1
Page: 1

Roux Associates, Inc.
TCL-SOIL
WETCHEM (SOIL)

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Method	Holding Time	Container
Cyanide, Total	57-12-5	1	0.166	mg/kg	80-120	35	75-125	35	35	9010C/9012A	14 days	1 - Glass 250ml/8oz unpreserved
Chromium, Hexavalent	18540-29-9	0.8	0.16	mg/kg	80-120	20	75-125	20	20	7196A	30 days	1 - Glass 120ml/4oz unpreserved

Please Note that the RL information provided in this table is calculated using a 100 % Solids factor (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc

APPENDICES

A. Professional Profiles

B. Roux Standard Operating Procedures

C. QA Glossary

APPENDIX A

Professional Profiles

ROUX

PROFESSIONAL PROFILE

Dana M. Hignell

Senior Engineer

TECHNICAL SPECIALTIES

Engineering services for the investigation, design, construction, and operation and maintenance of remedial systems for the treatment of contaminated soil, sediment, and groundwater. Remedial designs have included excavation, groundwater pump and treat systems, air sparging with soil vapor extraction, vapor barriers and sub-slab depressurization systems, and landfill soil cover systems.

EXPERIENCE SUMMARY

Over seventeen years of experience: Staff, Project, and Senior Engineer with Roux Associates, Inc.

CREDENTIALS

B.S., Chemical Engineering, Cornell University, 2000.

OSHA 40-hour Health & Safety Course, 2000.

OSHA 8-hour Health & Safety Refresher Course, 2000-Present.

KEY PROJECTS

- Senior Engineer for the design and implementation of a passive product-recovery system using horizontal recovery wells at a former bus garage in Newark, New Jersey. The remedial action also included excavation and offsite disposal of approximately 7,000 tons of petroleum contaminated soil, and in-situ chemical oxidation to treat residual soil and groundwater contamination.

- Senior Engineering managing the investigation, design and implementation of product-recovery skimming systems for a former petroleum refinery in Queens, New York. Approximately 80,000 gallons of product has been recovered to date.

- Senior Engineer for the design of a sub-slab depressurization system with vapor barrier for the construction of a 19-story residential building in Brooklyn, New York.

- Senior Engineer for the investigation, design and implementation of a soil remediation project at a Former Oil Terminal in Sag Harbor, New York. The remedy completed includes excavation and offsite disposal of approximately 2,000 tons of petroleum contaminated soil in an active roadway surrounded by underground utilities.

- Senior Engineer for the investigation, design, and implementation of a soil remediation project at a 4-acre Former Oil Terminal in Cold Spring Harbor, New York. The remedy completed includes excavation and offsite disposal of approximately 20,000 tons of petroleum contaminated and/or hazardous lead contaminated soil in accordance with the future use of the site under an Environmental Easement. Additional activities completed at the site included asbestos remediation followed by building demolition, UST removal, and cesspool remediation.

- Project Engineer for the complete design for a 9-acre landfill in Rensselaer, New York as part of the NYSDEC Voluntary Cleanup Program. The design was in accordance with the future use of the Site as a landfill with an integrated wildlife habitat vegetative cap and included hot spot soil excavation and installation of a vegetative cap.

- Project Engineer for the design of a soil and groundwater remediation system for a Former Oil Terminal in Oceanside, New York. A risk-based remedial approach that called for the remediation of "hot spot" source area soils, and mass-reduction of VOCs in groundwater was successfully utilized for the Site. To address the soil contamination in the source areas, "hot spot" soil excavation was completed. A groundwater pump and treat system was designed, constructed, and continues to be operated and maintained to address the VOC contaminants in groundwater. The system consists of 7 recovery wells, an oil/water separator, and a packed column air stripping tower. Over 11 million gallons of groundwater have been recovered and treated.

- Project Engineer for the design and startup of a soil vapor extraction (SVE) and air sparge (AS) system at an 11-acre active Oil Terminal in Glenwood Landing, NY. The system was installed to address soil and groundwater contaminants and consists of 4 horizontal SVE wells and 8 AS wells. The recovered soil vapor is treated by carbon units before being discharged. Approximately 12,000 pounds of hydrocarbon have been recovered since system start up.

- Project Engineer for the design and startup of a soil vapor extraction (SVE) and air sparge (AS) system at an 11-acre active Oil Terminal in Inwood, NY. The system was installed to address soil and groundwater contaminants and consists of 4 vertical SVE wells and 6 AS wells. The recovered soil vapor is treated by carbon units before being discharged. Approximately 32,000 pounds of hydrocarbon have been recovered since system start up.

Operation and Maintenance (O&M) Experience:

* Project Engineer responsible for the O&M and monitoring of a SVE system and a dual-pump, product-recovery system at an active Oil Terminal in Inwood, New York. O&M activities included system operation and maintenance, performance monitoring, and preparation of quarterly status reports for submission to the NYSDEC. The SVE system consists of 5 SVE wells and was designed, constructed, operated and maintained for a period of approximately 6 years. The SVE system was permanently shut down and this area of the Site is currently in the post-remediation monitoring phase. The dual-pump system, including groundwater and product recovery and packed column air stripping towers, is currently still in operation.

* Project Engineer responsible for the operation and maintenance of soil and groundwater remediation systems for an active Oil Terminal in Glenwood

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2329
E-mail: dhignell@rouxinc.com | Website: http://www.rouxinc.com

Dana M. Hignell
Senior Engineer

Landing, New York. A groundwater pump and treat system, consisting of 1 recovery well, two packed column air stripping towers, bag filters and granular activated carbon units, has been in operation at the Site to address VOC contaminants in groundwater. In addition, a SVE/AS system, previously installed, was upgraded to further address soil and groundwater contaminants at the Site boundaries. The SVE system consisted of vertical wells in an area of shallow groundwater. The system was upgraded with 7 horizontal wells and an additional 5 AS wells were installed. Following an on-site diesel spill of approximately 5,000 gallons in 2005, free-product recovery efforts were implemented, including removal of saturated soils and installation of a free-product recovery system.

* Staff Engineer responsible for the O&M and monitoring of a SVE/AS system for nationwide distribution center in Brooklyn, New York as part of the NYSDEC Voluntary Cleanup Program. O&M activities included system operation and maintenance, performance monitoring, soil gas monitoring, quarterly monitoring, and preparation of quarterly and annual status reports for submission to the NYSDEC. The SVE and AS system consists of 8 SVE wells and 17 AS wells and was designed, constructed, operated and maintained for a period of approximately 3 years. The SVE and AS system is permanently shut down and the Site is currently in the post-remediation monitoring phase.

* Staff Engineer responsible for the O&M of a 430-gpm, dual-pump, product-recovery system in Greenpoint, Brooklyn, New York. Processes and system maintained include dual-pump ground-water and product recovery, low profile air strippers and a catalytic oxidation unit. The Site encompasses one of the nation's largest petroleum releases (18 million gallons).

UST Experience:

* Project Engineer for the management of the excavation and removal of a 10,000-gallon UST and four ASTs ranging from 284,000-gallon capacity to 976,000-gallon capacity at a former Oil Terminal in Cold Spring Harbor, New York. The scope of work entailed preparation of a UST and AST closure work plan, project management of the field work, post-excavation and tank footprint sampling and preparation of a UST and AST Closure Report.

* Project Engineer for the excavation oversight of a 2,000-gallon heating oil UST at an active Oil Terminal in Glenwood Landing, New York. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report.

* Project Engineer for the excavation oversight of a 2,000-gallon heating oil UST at an active Oil Terminal in Inwood, New York. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report. Also included was the management and field oversight of the closure of an in-ground oil/water separator at an active Oil Terminal Inwood, New York. The scope of work entailed preparation of an oil/water separator closure work plan, project management of the field work, excavation of petroleum contaminated soils associated with the separator, post-excavation sampling, and preparation of an Oil/Water Separator Closure Report.

* Staff Engineer for the excavation oversight of three 8,000-gallon USTs, two pump islands and three hydraulic lifts and all associated piping at a former service station in Norwalk, Connecticut. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report.

* Staff Engineer for the excavation oversight of three 8,000-gallon USTs, two pump islands and all associated piping at a former service station in Hartford, Connecticut. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report.

Soil and Groundwater Remediation:

* Project Engineer for the design of soil remediation at an active Oil Terminal in Stamford, Connecticut to remove contaminated soils following a 30,000-gallon petroleum spill in 2006. The remediation included excavation of approximately 1,000 cubic yards of petroleum-impacted soil with post-excavation sampling.

* Staff Engineer responsible for construction management of remediation of a former major pharmaceutical plant located in Hicksville, New York as part of the State Superfund Program. The project consisted of the excavation of non-hazardous soil from 5 on-site drywells and a former waste disposal area, implementation of a community air monitoring plan, coordination with the Long Island Rail Road (LIRR) for work performed within the LIRR's right of way, steel sheeting installation and removal, backfilling, monitoring well abandonment and replacement, transportation and disposal of 3,300 tons of VOC, SVOC and metal contaminated soil, and restoration of approximately 9,800 square feet of asphalt. A 7-foot diameter steel caisson was used to support the deeper excavation required at the invert of two drywells. This innovative approach saved the client approximately $50,000 in costs that would have been incurred by using a traditional steel sheeting support system to protect the on-site commercial building.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2329
E-mail: dhignell@rouxinc.com | Website: http://www.rouxinc.com

Dana M. Hignell
Senior Engineer

Stormwater:

* Project Engineer for the design and construction management of a stormwater drainage upgrade project for the parking lot of a former manufacturing facility (costume jewelry and then surgical needles) located in Queens Village, New York. The storm-water drainage system consisted of multiple catch basins, a new drain and curb, and all associated piping.
* Project Engineer for the design and construction of two stormwater management ponds and swales for a former landfill in Rensselaer, New York. The ponds and swales were constructed as part of the landfill cap project to direct stormwater to existing catch basins, allow stormwater overflow control and to enhance the wildlife habitat.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2329
E-mail: dhignell@rouxinc.com | Website: http://www.rouxinc.com

ROUX

PROFESSIONAL PROFILE

Frank Cherena
Principal Geologist

TECHNICAL SPECIALTIES
Project Management and Field Management of Phase I and Phase II Environmental site assessments. GIS data analysis and mapping. Project Management and oversight of remediation and construction activities. Additional experience includes the performance of investigation design and agency correspondence for petroleum and chlorinated solvent remediation projects.

EXPERIENCE SUMMARY
Fifteen years of experience: Principal Geologist with Roux Associates, Inc., Islandia, New York; Staff Geologist with RTP Environmental Associates, Inc., Green Brook, New Jersey.

CREDENTIALS
B.A., Geology, Colgate University, 2003
OSHA 40-Hour Hazardous Materials Training, 2003
OSHA 8-Hour Supervisor Training, 2004
Accredited AHERA Inspector, 2004
State of New York Asbestos Inspector Certificate, 2004
NJ UST Subsurface Evaluator Certification# 491925, 2009

KEY PROJECTS
- Principal in charge of large university tech development project in New York City. The project consists of the demolition and decommissioning of a former hospital building, and excavation for redevelopment of four separate buildings for the first phase of campus construction. Environmental considerations on the project included site assessment, remediation design and oversight, SDPES permitting (construction dewatering and geothermal well discharge), soil characterization for reuse and capping of soils. Coordinated with NYCDEP, and other project stakeholders concerning community protection and monitoring concerns.
- Principal in charge of redevelopment of shopping mall in Staten Island, New York. The Site will consist of the construction of two commercial out parcel buildings, a new parking deck, and an expansion of the existing mall building. Areas of concern include historical fill, site-wide soil contamination (arsenic and pesticides). In addition, also responsible for agency coordination with FDNY, NYSDEC, and NYCOER for mitigation of methane and chlorinated volatile organic compounds vapor issues.
- Principal in charge for new development of a large regional mall in Norwalk, Connecticut with underground parking. The proposed redevelopment will result in the construction of a retail shops, restaurants, hotel, and entertainment. Previous usage of the property included over 30 different parcels including three establishments, gasoline filling stations, fuel oil terminal storage, hazardous waste disposal areas. The project includes investigation and subsequent remediation of petroleum and hazardous waste releases, filing of the Environmental Conditions Assessment Form (ECAF) associated with the three transfer act parcels
- Project Manager for the largest redevelopment project in New York City (over $4.5 billion). Project includes Phase I and Phase II ESAs (investigation of soil, groundwater, and soil vapor) at over 75 properties; Construction support for excavation of one million cubic yards of soil including implementing an in situ waste characterization program; Environmental support for demolition, asbestos and lead abatement, site remediation using In Situ Chemical Oxidation, and relocating of an active 9-acre 100-year old railyard; Property acquisition support throughout the project (7 city blocks); and Agency support for NYSDEC, NYCDEP, MTA (LIRR/NYCT), and ESDC. The environmental data was used as an integral component of the New York State Environmental Quality Review Act (SEQRA) final Environmental Impact Statement (EIS). The project will encompass 336,000 sq. ft of office space, 6.4 million sq. ft of residential space, an 18,000 seat sports and entertainment venue - the Barclays Center (home of the Nets professional basketball team) - 247,000 sq. ft of retail space, a 165,000 square-foot hotel, and over 8 acres of intricately designed publicly accessible open space.
- Principal in Charge of numerous due diligence projects for owners, developers, managers, municipalities, and lenders at commercial and industrial properties throughout the Northeast. Activities included performance of UST evaluations and closures, hot spot remediations, Phase I and Phase II Site Assessments, vapor intrusion studies and mitigation, lead based paint, asbestos and hazardous materials surveys, interaction with regulatory agencies on behalf of clients and development of remedial cost estimates for planning and negotiation.
- Principal in Charge for investigation and review of a former electroplating facility in Bay Shore, New York with chlorinated solvent DNAPL. Activities included historical document review, subsurface investigation, and coordination with outside legal counsel and NYSDEC.
- Implemented GIS analysis and mapping for a remedial study and alternative analysis report (AAR) for an active petroleum storage terminal in Buffalo, New York under jurisdiction of the NYSDEC. The AAR required spatial analyses in order to categorize and analyze contaminant data from multiple investigations, investigate remedial alternatives, and to help focus ongoing additional investigations.
- Project manager for a property transfer support project at a heavily contaminated state-of-the-art distribution facility in the Bronx, New York. The site was a former MGP being handled under the VCP in central office, the site had an open spill under the regional spills group

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2388
E-mail: fcherena@rouxinc.com | Website: http://www.rouxinc.com

Frank Cherena
Principal Geologist

and the site was attempting to apply to the BCP through the regional office. Roux performed a Phase I for the buyer, a Phase II and remedial cost estimate for the owner and negotiated with the buyer's consultant and NYSDEC to limit the scope of the investigation and cleanup.

- Served as Environmental Professional on hundreds of Phase I Environmental Site Assessments according to ASTM E1527-00, ASTM E1527-05, and ASTM E1527-13 for due diligence of large retail shopping centers, industrial facilities, and office buildings. Associated activities included agency contact, database management and interpretation, report preparation, and recommendations for additional work.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2388
E-mail: fcherena@rouxinc.com | Website: http://www.rouxinc.com

ROUX

PROFESSIONAL PROFILE

Jeffrey Wills
Senior Hydrogeologist

TECHNICAL SPECIALTIES

Design, implementation, and management of remedial investigations and Phase II ESAs. New York State Brownfields Cleanup Program; New York City Office of Environmental Remediation Voluntary Cleanup Program; and New York State Inactive Hazardous Wastes Site Program and Spills.

EXPERIENCE SUMMARY

12 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-Alleghenian Deformation of the Shawangunk Ridge in New York and New Jersey*, 2005

OSHA 40-Hour HAZWOPER Training: 2006

OSHA 8-Hour Refresher: 2017

OSHA 10-Hour Training: 2018

Loss Prevention Systems Training Certification: 2008

Loss Prevention Systems Training Refresher: 2014

KEY PROJECTS

- 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.
- 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 investigation, remedial investigations (soil, groundwater and soil vapor), site-wide in situ waste characterization sampling program and a Remedial Action Work Plan and management of soil excavations.
- Project Manager for a 13-acre 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.
- Project Manager for a former dry cleaner site 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.
- Field 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.
- Field 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.
- Project Hydrogeologist responsible for the management of investigation and remediation at various mixed development sites containing hazardous and non-hazardous soils in New York City. These projects included the implementation of Remedial Investigations, in situ waste characterization sampling program and a Remedial Action Work Plan, 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 (NYC OER) and Brownfield Cleanup Program (BCP).
- 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

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2366
E-mail: jwills@rouxinc.com | Website: http://www.rouxinc.com

Jeffrey Wills
Senior Hydrogeologist

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 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.

- Field 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.
- Field Investigations Manager for Phase II Remedial Investigations associated with petroleum contamination at a 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.
- Field 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.
- Site/Field 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.
- Field 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 affiliated piping.
- Field manager for several enhanced bioremediation programs at NYPD precincts and NYC Parks facilities, which included the installation of multiple oxygen releasing compound (ORC) injection point wells.
- Performed field investigations for petroleum contamination at FDNY Engine Company 243, New York, Responsibilities included location of former AST area, interviewing of FDNY employees, and gathering of historical records.
- Field manager for well decommissioning at various sites in Brooklyn, New York; Additional responsibilities included the preparation of well decommissioning logs for submittal to NYSDEC.
- Field manager for sub-slab soil vapor sampling at a factory in Deer Park, New York.
- Assisted in the collection of wall rinsate samples for a hazardous-waste Site in Brooklyn, New York.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2366
E-mail: jwills@rouxinc.com | Website: http://www.rouxinc.com

JUDY V. HARRY
P. O. Box 208
120 Cobble Creek Rd.
North Creek, NY 12853

Occupation: Data Validator/Environmental Technical Consultant

Years Experience: 41

Education: B.S., Chemistry, Magna cum laude, 1976, Phi Beta Kappa

Certifications: New York State Woman-Owned Business Enterprise (WBE)

Relevant Work History:

Data Validation Services: September 1989 - present

Sole proprietor of Data Validation Services, a woman-owned small business registered with SAM, providing consultation/validation services to regulatory and commercial clients.

These services include the review of analytical laboratory data for compliance with respect to specific protocols, accuracy and defensibility of data, verification of reported values, and evaluation of quality parameters for analytical usability of results. Approved by USEPA, NYSDEC, NJDEP, NYSERDA, and NYCDEP as a data validator for projects, including USEPA Superfund, Brownfield, and lead sites, and those contracted through the NYSDEC Division of Hazardous Waste Remediation, Division of Solid Waste, and Division of Water Quality.

Performed validation for compliance with laboratory analytical protocols including USEPA OLM, USEPA OLC, USEPA ILM, USEPA DFLM, USEPA SOW3/90, USEPA SOW 7/87 CLP, USEPA SOW 2/88 CLP, USEPA SW846, RCRA, AFCEE, NYS 6 NYCRR Part 360, 40 CFR, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, including TO-15, 1989/1991/1995/2000/2005 NYSDEC ASPs, and 1987 NYSDEC CLP.

Performed validation according to the USEPA National and Regional SOPs and Functional Guidelines, AFCEE requirements, NYSDEC Validation Scope of Work, NYS DUSR, and NJDEP Division of Hazardous Site Mitigation/Publicly Funded Site Remediation SOPs.

Performed validation for USEPA Superfund Sites including Salem Acres, York Oil, Port Washington L-4 Landfill, Bridgeport Rental and Oil Services, GE-MRFA, MMR/ OTIS AFB, LCP, and Peter Cooper site; and for USEPA lead sites including SJ&J Piconne, Maska, Bowe System, Jones Sanitation, and Syossett Landfill, involving CLP, RAS, and SAS protocols.

Contracted for NYSDEC Superfund Standby Contracts with LMS Engineers, HDR, CDM Smith, Malcolm-Pirnie/ARCADIS, Ecology & Environment, Shaw Environmental, CG&I, O'Brien & Gere Engineers, and EC Jordan, involving samples collected at NYS Superfund Sites and analyzed under the NYSDEC ASP.

Performed validation services for NYSDEC Phase II remedial investigations, RI/FS projects, Brownfield sites, and PRP over-site projects for hazardous waste sites.

Performed validation services for clients conducting RI/FS activities involving samples of many matrices, including waste, air, sludges, leachates, solids/sediments, aqueous, and biota.

Clients have included AECOM, ARCADIS, Barton & Loguidice, Benchmark Engineering, Bergmann Associates, Blasland, Bouck & Lee, Brown and Caldwell, CDM Smith, CB&I Shaw Environmental, C&S Consulting Engineers, Chazen Companies, Clough Harbour & Associates, Columbia Analytical Services, C.T. Male, Dames & Moore, Day Engineering, EA Engineering, EcolSciences, Ecology & Environment, Ecosystems, EC Jordan, Environmental Chemical Corporation, EHRT, ENSR Consulting, ELM, ERM-Northeast, Fagan Engineers, Fanning Phillips & Molnar, FluorDaniel GTI, Frontier, Foster Wheeler Environmental Corp, Frontier Technical, Galson Consultants, GE&R, Geomatrix Consultants, GZA Environmental, Handex of N, H2M Group, HDR, HRP, IT Corp, Jacques Whitford, JTM Associates, Labella Associates, Langan Engineers, Leader Environmental, Lockwood, Kessler & Bartlett, LMS Engineers, Malcolm-Pirnie, Metcalf & Eddy, NWEC&C, O'Brien & Gere Engineers, Pace, Parsons Engineering-Science, Plumley Engineering, Prescott Environmental, P. W. Grosser, Rizzo Associates, Roux Associates, Sear Brown Group, SECOR, Shaw Environmental, Stantec, ThermoRemediation Inc., TRC Environmental, Turnkey Environmental Restoration, TVGA Engineering, URS Consultants, Wehran Emcon, Weston, YEC, and private firms.

Provided consultation services to laboratories regarding analytical procedures and protocol interpretation, and to law firms for litigation support.

Provided services to firms involving audits of environmental analytical laboratories to determine analytical capability, particularly for compliance with NYSDEC ASP and AFCEE requirements.

Guest speaker on a panel discussing Data Review/Compliance and Usability, for an analysis workshop for the New York Association of Approved Environmental Laboratories, 1993.

Adirondack Environmental Services: June 1987 - August 1989

Senior mass spectroscopist for AES. Responsible for GC/MS analyses of environmental samples by USEPA and NYSDEC protocols, development of the GC/MS laboratory, initiating the instrumental and computer operations from the point of installation, and for implementing the procedures and methodologies for Contract Laboratory Protocol.

CompuChem Laboratories: May 1982 - January 1987

Managed a GC/MS production laboratory; developed, implemented, and supervised QA/QC criteria at three different levels of review; and was responsible for the development and production of the analysis of environmental and clinical samples. Directed a staff of 23 technical and clerical personnel, and managed the extraction and GC/MS labs and data review operations.

Research Triangle Institute: December 1979 - May 1982

Worked as an analytical research chemist responsible for development of analytical methods for the EPA Federal Register at RTI. This involved analysis of biological and environmental samples for priority pollutants, primarily relating to wastewaters and to human sampling studies. Method development included modification and interfacing of the initially developed Tekmar volatile purge apparatus to GC/MS, development and refinement of methods for entrapment and concentration of the air medium for subsequent volatile analysis, and the analysis and resolution/ identification of individual PCB congeners within Aroclor mixtures by capillary column and mass spectra.

Guardsman Chemical Company: February 1977 - November 1979

Performed all quality control functions for the manufacturing plant. Performed research and development on coatings and dyes.

Almay Cosmetics: May 1976 - December 1976

Product evaluation chemist. Responsible for analytical QC of manufactured products.

Publication

Pellizzzari, E.D., Moseley, M.A., Cooper, S.D., Harry, J.V., Demian, B., & Mullin, M. D. (1985). Recent Advances in the Analysis of Polychlorinated Biphenyls in Environmental and Biological Media. *Journal of Chromatography*, 334(3) 277-314.

APPENDIX B

Roux Standard Operating Procedures

Date: January 9, 2011
Revision: May 12, 2015

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to establish guidelines for the collection of soil samples for laboratory analysis. This SOP is applicable to soil samples collected from split-spoon, Geoprobe™ core samples, and Sonic core samplers during drilling, hand auger samples, grab samples from stockpiled soils, surface samples, test pit samples, etc.

2.0 CONSIDERATIONS

Soil samples may be collected in either a random or biased manner. Random samples can be based on a grid system or statistical methodology. Biased samples can be collected in areas of visible impact or suspected source areas. Soil samples can be collected at the surface, shallow subsurface, or at depth. When samples are collected at depth, the water content should be noted, since generally "soil sampling" is restricted to the unsaturated zone. Equipment selection will be determined by the depth of the sample to be collected. A thorough description of the sampling locations and proposed methods of sample collection should be included in the work plan.

Commonly, surface sampling refers to the collection of samples at a 0 to 6 inch depth interval. Certain regulatory agencies may define the depth interval of a surface sample differently, and this must be defined in the work plan. Collection of surface soil samples is most efficiently accomplished with the use of a stainless steel trowel or scoop. For samples at greater depths, a Geoprobe™ or other direct push sampling method, or a decontaminated bucket auger or power auger may be needed to advance the hole to the point of sample collection. If augering to depth, once the sampling depth is reached a clean bucket auger should be used to collect the sample. To collect samples at depths of greater than approximately six feet, the use of a drill rig (direct push, split spoon, etc) will usually be necessary. In some situations, such as an excavation or trench, sample locations are accessed with the use of a backhoe.

3.0 EQUIPMENT AND MATERIALS

a. Safety first. Obtain the appropriate Job Safety Analysis (JSA) and personal protection equipment (PPE), as specified in the site Health and Safety Plan (HASP).

b. A work plan which outlines soil sampling requirements.

c. Field notebook, field form(s), maps, chain-of-custody forms, and custody seals.

d. Decontamination supplies (including: non-phosphate laboratory grade detergent, buckets, brushes, potable water, distilled water, plastic sheeting, etc.).

e. Sampling device (split-spoon sampler, stainless steel hand auger, stainless steel trowel, etc.).

f. Stainless steel spoons or spatulas.

g. Disposable Nitrile sampling gloves and cut-proof gloves.

h. Laboratory-supplied sample containers with labels.

i. Cooler with blue or wet ice.

j. Plastic sheeting.

k. Black pen and indelible marker.

l. Zip-lock bags and packing material.

m. Tape measure.

n. Paper towels or clean rags.

o. Masking and packing tape.

p. Overnight (express) mail forms or schedule courier pickup.

4.0 DECONTAMINATION

All reusable sampling equipment will be thoroughly cleaned according to the decontamination SOP (ROUX SOP 9.1). Where possible, thoroughly pre-cleaned and wrapped sampling equipment should be used and dedicated to individual sampling locations. Disposable items such as sampling gloves and plastic sheeting will be changed after each use and discarded in an appropriate manner.

5.0 PROCEDURE

5.1 Prior to collecting soil samples, ensure that all sampling equipment has been thoroughly cleaned according to the ROUX SOP 9.1 decontamination procedures. If samples are to be collected at depth, then the boring must be advanced with thoroughly cleaned equipment to the desired sampling horizon and a different thoroughly cleaned sampler must be used to collect the sample.

5.2 Using disposable gloves and a pre-cleaned, stainless steel spatula or spoon, extract the soil sample from the sampler, measure the recovery, and separate the wash from the true sample. Where allowed by regulatory agency(ies), disposable plastic spoons may be used. The gloves should not come in contact with the media being sampled and should be changed any time during sample collection when their cleanliness is compromised

When sampling shallow soils, if a thick, matted root zone, gravel, concrete, etc. is present at or near the surface, it should be removed before the sample is collected. The depth measurement for the sample begins at the top of the soil horizon, immediately following any removed materials.

When using direct push sampling methods, it is important to maintain the proper orientation of the sample when the sampling liners are removed from the sample tubes define precisely the depth at which an aliquot was collected. This is particularly important when multiple sample depths are collected from the same push.

When utilizing a split spoon sampling method, always discard the top several inches of material in the spoon before removing any portion for sampling. This material normally consists of borehole wall material that has sloughed off of the boregole wall after removal of the drill string prior to inserting the split spoon.

When utilizing a backhoe to collect soil samples from a trench or excavation, measures should be taken to ensure that the bucket is decontaminated and that no paint, grease, and rust is present prior to sample collection.

5.3 Place the sample in a laboratory-supplied, pre-cleaned sample container. Cut-proof gloves should be worn at all times when handling glassware. This should be done as quickly as possible and this is especially important when sampling for volatile organic compounds (VOCs). Samples to be analyzed for VOCs must be collected prior to other constituents.

If samples are to be analyzed for VOCs, they should be collected in a manner that minimizes disturbance of the sample. ***Samples for VOC analysis must not be homogenized.***

5.4 The sample container will be labeled with appropriate information such as, client name, site location, sample identification (location, depth, etc.), date and time of collection, and sampler's initials.

5.5 Using the remaining portion of soil from the sampler, log the sample in detail and record physical characteristics (color, odor, moisture, texture, density, consistency, organic content, layering, grain size, etc.). Refer to Soil Classification and logging SOP.

5.6 If soil samples are to be composited in the field, then equal portions from selected locations will be placed on a clean plastic sheet or in a Zip-lock bag and homogenized. make sure that each composite location (aliquot) consist of equal volumes,(i.e., same number of equal spoonfuls). Alternately, several samples may be submitted to the laboratory for compositing by weight. The method used is dependent upon regulatory requirements. Specific compositing procedures shall be approved by the appropriate regulatory agency and described in the work

plan. Samples to be analyzed for VOCs will not be composited unless required by a regulatory agency.

5.7 After the sample has been collected, labeled, and logged in detail, it is placed in a zip-lock bag and stored in a cooler with ice, at 4°C. Store the sample cooler in a secure location.

5.8 A chain-of-custody form is completed for all samples collected. One copy is retained and two are sent with the samples in a Zip-lock bag to the laboratory. A signed and dated custody seal is placed on the cooler prior to shipment.

5.9 Samples collected from Monday to Friday are typically to be delivered to the laboratory within 24 hours of collection. If Saturday delivery is unavailable, samples collected on Friday must be delivered by Monday morning. Check the work plan to determine if any analytes require a shorter delivery time.

5.10 The field notebook and appropriate forms should include, but not be limited to, the following: client name, site location, sample location, sample depth, sample identification, sample date and time collected, sampler's name, method of sample collection, number and type of containers, geologic description of material, description of decontamination procedures, etc. A site map should be prepared with exact measurements to each sample location in case follow-up sampling is necessary.

5.11 All reusable sampling equipment must be thoroughly cleaned in accordance with the ROUX SOP 9.1 decontamination procedures. Following the final decontamination (after all samples are collected), the sampling equipment is wrapped with plastic. Discard any gloves, plastic, etc. in an appropriate manner that is consistent with site conditions.

END OF PROCEDURE

Date: January 9, 2011
Revision: May 5, 2015

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 field investigation activities (i.e. drilling, soil and water sampling).

The objective of decontamination is to ensure that all field samplingequipment 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.

The decontamination line is setup so that the first station is used to clean the most contaminated item. It progresses to the last station where the least contaminated item is cleaned. A site is typically divided up into the following boundaries: Hot Zone or Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ), and the Support or Safe Zone (SZ). The decontamination line should be setup in the Contamination Reduction Corridor (CRC).

In considering decontamination procedures, state and federal regulatory agency requirements must be considered because of potential variability between state and federal requirements. 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.

The equipment and materials list for decontamination activities may include, but not necessarily be limited to, the following:

a. A work plan and health and safety plan which outlines decontamination procedures and requirements.

b. Field notebook and field form(s).

c. Decontamination solutions, including as necessary: non-phosphate, laboratory-grade detergent; distilled/deionized water; potable water; cleaning solvents if needed [e.g., hexane, acetone, nitric acid).

d. Long and short handled brushes,

e. Bottle brushes

f. Drop cloth/plastic sheeting

g. Paper towels

h. Plastic or galvanized tubs or buckets

i. Pressure washers or steam cleaners

j. Solvent sprayers

k. Trash / bilge pumps

l. Aluminum foil

m. 55-gallon drums.

2.0 PROCEDURE FOR DRILLING EQUIPMENT

The following is a minimum decontamination procedure for drilling equipment. Drilling equipment decontamination procedures will be documented on an appropriate field form or in the field notebook, especially any variation from the method itemized below:

2.1 Safety first. Obtain the appropriate Job Safety Analysis (JSA) and personal protection equipment (PPE), as specified in the site Health and Safety Plan (HASP). Prior to mobilization to a site, the expected types of contamination should be evaluated to determine if the field cleaning and decontamination activities will generate rinsates and other waste waters that might be considered RCRA hazardous waste or may require special handling.

2.2 The drill rig and all associated equipment should be properly decontaminated by the contractor before arriving at the site.

2.3 The augers, drilling casings, rods, samplers, tools, and any piece of equipment that can come in contact (directly or indirectly) with the soil, requires proper decontamination on-site prior to commencing drilling. The project work plan or HASP, and appropriate regulatory requirements, should be consulted to determine site-specific decontamination requirements.

2.4 The same decontamination procedures used prior to drilling will be followed between boreholes (at a fixed on-site location[s], if appropriate) and before leaving the site at the end of the investigation.

2.5 All on-site steam cleaning or (decontamination) activities will be monitored and documented by a member(s) of the staff of Roux Associates, Inc. and should be performed on a decontamination pad that meets the following specifications:

1. The pad should be constructed in an area known or believed to be free of surface contamination.
2. A temporary pad should be lined with a water impermeable material with no seams within the pad. This material should be either easily replaced disposable) or repairable.The pad should be regularly inspected to ensure there are no leaks.

3. Water should be removed from the decontamination pad frequently.

2.6 If drilling activities are conducted in the presence of thick, sticky oils (e.g., PCB oil) which coat drilling equipment, then special decontamination procedures may have to be utilized before steam cleaning (e.g., hexane scrub and wash).

2.7 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 federalregulatory requirements.

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 Safety first. Obtain JSA and PPE, as specified in the site HASP.

3.2 Wear disposable gloves while cleaning equipment to avoid cross-contamination and change gloves as needed.

3.3 Steam clean the sampler or rinse with potable water. If soil-sampling activities are conducted in the presence of thick, sticky oils (e.g., PCB oil) 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).

3.4 Prepare a non-phosphate, laboratory-grade detergent solution and distilled or potable water in a clean bucket.

3.5 Disassemble the sampler, as necessary and immerse all parts and other sampling equipment in the solution.

3.6 Scrub all equipment in the bucket with a brush to remove any adhering particles.

3.7 Rinse all equipment with copious amounts of potable water followed by distilled or deionized water.

3.8 Place clean equipment on a clean plastic sheet (e.g., polyethylene)

3.9 Reassemble the cleaned sampler, as necessary.

3.10 After equipment has been cleaned, all individuals involved in equipment handling should don 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 Safety first. Obtain the JSAs and PPE, as specified in the site HASP.

4.2 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 sampling equipment. Discard all used sampling tubes and cords in an appropriate manner. Disconnect all power sources from electrical equipment (i.e. pumps). Scrub each piece of equipment with a brush and solution.

d. Rinse all sampling equipment with copious amounts of potable, distilled or deionized water, Reassemble equipment as per the manufacturer's instructions.

f. Air dry.

g. Wrap equipment with a suitable material (e.g., clean plastic bag, aluminum foil).

4.3 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.

END OF PROCEDURE

APPENDIX C

QA Glossary

QUALITY ASSURANCE GLOSSARY

"**Alteration**" means altering a sample collected for analysis in any way other than by adding a preservative, such as nitric acid to lower pH. Examples of alteration include, but are not limited to: filtering, settling and decanting, centrifuging and decanting and acid extracting.

"**Analytical Services Protocol**" or "**ASP**" means DEC's compilation of approved EPA laboratory methods for sample preparation, analysis and data handling procedures.

"**Correlation sample**" means a sample taken, when using a field-testing technology, to be analyzed by an ELAP-certified laboratory to determine the correlation between the laboratory and field analytical results.

"**Effective solubility**" means the theoretical aqueous solubility of an organic constituent in groundwater that is in chemical equilibrium with a separate-phase (NAPL) mixed product (product containing several organic chemicals). The effective solubility of a particular organic chemical can be estimated by multiplying its mole fraction in the product mixture by its pure-phase solubility.

"**Environmental Laboratory Accreditation Program**" or "**ELAP**" means a program conducted by the NYSDOH which certifies environmental laboratories through on-site inspections and evaluation of principles of credentials and proficiency testing. Information regarding ELAP is available at the NYSDOH Wadsworth Laboratory website.

"**Filtration**" means the filtering of a groundwater or surface water sample, collected for metals analysis, at the time of collection and prior to preservation. Filtering includes but is not limited to the use of any membrane, fabric, paper or other filter medium, irrespective of pore size, to remove particulates from suspension.

"**Final delineation sample**" means a sample taken to make a decision regarding the extent of contamination at a site during the investigation and the design of the remedy or confirmation/ documentation sampling during remedial construction, which is to be analyzed by an ELAP-certified laboratory.

"**Intermediate sample**" means a sample taken during the investigation or remediation process that will be followed by another sampling event to confirm that remediation was successful or to confirm that the extent of contamination has been defined to below a level of concern.

"**Method detection limit**" or "**MDL**" means the minimum concentration of a substance detected and which can be reported with a reasonable degree of accuracy. It is the lowest concentration that can be measured, a lab-specific number, developed from minimum detection limits, and is also referred to as the practical quantitation limit (PQL).

"**Nephelometric Turbidity Unit**" or "**NTU**" is the unit by which turbidity in a sample is measured.

"**Preservation**" means preventing the degradation of a sample due to precipitation, biological action, or other physical/chemical processes between the time of sample collection and analysis. The most common examples involve refrigeration at 4 degrees Celsius and lowering sample pH by the addition of acid to keep dissolved metals in solution or to reduce the biodegradation of dissolved organic analytes.

"**Target analyte list**" or "**TAL**" means the list of inorganic compounds/elements designated for analysis as contained in the version of the EPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration in effect as of the date on which the laboratory is performing the analysis. For the purpose of this chapter, a Target Analyte List scan means the analysis of a sample for Target Analyte List compounds/elements.

"**Targeted compound**" means a contaminant for which a specific analytical method is designed to detect that potential contaminant both qualitatively and quantitatively.

"**Target compound list plus 30**" or "**TCL+30**" means the list of organic compounds designated for analysis (TCL) as contained in the version of the EPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration in effect as of the date on which the laboratory is performing the analysis, and up to 30 non-targeted organic compounds (plus 30) as detected by gas chromatography/mass spectroscopy (GC/MS) analysis.

"**Tentatively identified compound or TIC**" means a chemical compound that is not on the target compound list but is detected in a sample analyzed by a GC/MS analytical method. TICs are only possible with methods using mass spectrometry as the detection technique. The compound is tentatively identified using a mass spectral instrumental electronic library search and the concentration of the compound estimated.

"**Well development**" means the application of energy to a newly installed well to establish a good hydraulic connection between the well and the surrounding formation. During development, fine-grained formation material that may have infiltrated the sand pack and/or well during installation is removed, allowing water from the formation to enter the well without becoming turbid and unrepresentative of groundwater in the formation.

APPENDIX E

Citizens Participation Plan

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
The Peninsula

January 2018

BCP Site #C203097
1221 Spofford Avenue
Bronx, New York

Contents

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **The Peninsula JV, LLC**
Site Name: **The Peninsula ("Site")**
Site Address: **1221 Spofford Avenue**
Site County: **Bronx**
Site Number: **C203097**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision-making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the Site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the Site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web-site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the Site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the Site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- Chief executive officer and planning board chairperson of each county, city, town and village in which the Site is located;
- Residents, owners, and occupants of the Site and properties adjacent to the Site;
- The public water supplier which services the area in which the Site is located;
- Any person who has requested to be placed on the site contact list;
- The administrator of any school or day care facility located on or near the Site for purposes of posting and/or dissemination of information at the facility;
- Location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the Site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the Site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the Site, as described in Section 5.

If the Site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the Site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the Site, and that its members' health, economic well-being

or enjoyment of the environment may be affected by a release or threatened release of contamination at the Site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the significant threat determination for the site had not yet been made.
To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at
http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies) • Prepare Remedial Investigation (RI) Work Plan	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the Site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process. In addition, there may be noise, odor, or truck traffic impacts concerning the cleanup process. The Site is currently undergoing environmental review through the City Environmental Quality Review (CEQR) process and a Draft Environmental Impact Statement (DEIS) has been prepared for the site.

The Site is located in a Potential Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

According to the 2010 Census tract data provided by NYSDEC and available from NYC Census Fact Finder (Appendix E), the Site's Census tract (216.02) includes both a sizable African-American and Hispanic-American population. Approximately 22% of the population is African-American, while 75% is Hispanic. Therefore, all fact sheets will be translated into Spanish.

No major issues of public concern have been identified relative to the Site as of yet. The Site is bordered by residential areas to the south and east, and commercial areas to the north and west.

The program will include procedures for protection of public health and safety during investigation and remediation activities. During investigation and remediation (if necessary), workers, community health, and safety activities will be conducted to include the following:

- Securing the work perimeter with an eight-foot chain link fence during demolition/remediation/construction;

- The work perimeter will also be secured with a 12-foot high perimeter noise wall around each construction area. The wall would be lined with quilted fiberglass to improve sound absorption and reduce construction noise levels at surrounding residential properties.

- On-site air monitoring for worker protection, if warranted;

- Perimeter air monitoring for community protection, if warranted and,
- Using odor, vapor, and dust controls such as water or foam sprays, as required by air monitoring, if needed.

Details on the Site Health and Safety Plan (HASP) and the Community Air Monitoring Plan (CAMP) will be included in the documents generated in support of the remediation.

Per the NYCEDC Hunts Point Peninsula website, the Hunts Point Vision Task Force has the following goals with regards to the redevelopment of this South Bronx area (https://www.nycedc.com/project/hunts-point-peninsula):

Optimizing Land Use: Including the redevelopment of brownfields and a special district rezoning that expands opportunities for industrial and large retail uses, and strengthens the buffer between residential and noxious industrial uses. For more information on the Hunts Point rezoning, visit the Department of City Planning.

Implementing Workforce Solutions: Including the creation of a permanent Hunts Point Workforce Career Center within the Hunts Point peninsula. For more information about the Workforce Career Center, visit the Department of Small Business Services.

Creating Connections: Including greater access to the waterfront, streetscape enhancements, and intersection improvements for pedestrian safety. For more information, review the South Bronx Greenway plan.

Improving Traffic Safety & Efficiency: Including the development of an alternative fueling facility, implementation of new truck routes and signage, and the reconfiguration of Food Center Drive.

The redevelopment will include affordable housing which is a priority of the NYC mayor's office. Mayor Bill de Blasio has committed the City to "build or preserve nearly 200,000 affordable units, and help both tenants and small landlords preserve the quality and affordability of their homes" through the Housing NY Plan. In accordance with the Hunts Point Vision Task Force, the proposed brownfield redevelopment will "optimize land use" on a currently vacant property to provide not only a grocery store and affordable housing but to also provide light industrial space that will be used for food and beverage production, retail, and media/TV production.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

The Site is located in New York City at 1221 Spofford Avenue in the Hunts Point neighborhood of Bronx, NY, as shown on Figure 1 (Appendix C). The Site is located in an urban setting, and is an entire city block, approximately 3.78 acres in size. It is bordered by the Corpus Christi Monastary to the North, Spofford Avenue to the South, Tiffany Street to the West and Manida Street to the East. In aggregate, the Site is referred to as The Peninsula and is occupied by the vacant Spofford (aka Bridges) Juvenile Detention Center.

Immediately north of the Site across East Tremont Avenue is an active monastery. Immediately east of the Site is the Administration for Children's Services (ACS) head start day care facility called the La Peninsula Community Organization, Inc. Further east across Manida Street are one and two-family homes. Across Spofford Avenue south of the Site are multi-family apartment buildings. There are commercial and industrial properties located to the west of the Site across Tiffany Street.

History of Site Use, Investigation, and Cleanup

Based upon the Environmental Data Resources (EDR) City Directory and historical Sanborn maps, the Site was developed circa 1896 solely for residential use until the 1940's. In addition to providing residential use, sometime around 1915 the western portion of the property was improved for use as a stone cutting yard. The Site was redeveloped and became the location of the former Spofford Juvenile Detention Facility (later renamed as Bridges Juvenile Center) and was in operation from its construction in 1956 through 2011.

The following environmental concerns are associated with the Site:

- Petroleum Underground Storage Tanks (USTs) of unknown integrity;
- Documented soil and groundwater contamination from known releases;
- Soil and groundwater contamination within the building of the former Spofford Juvenile Detention Center and;
- Presence of historical fill of unknown origin or quality.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for restricted purposes.

To achieve this goal, the Applicant will conduct investigation and/or cleanup activities at the Site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant has completed a partial site investigation before it entered into the BCP. For the partial investigation, NYSDEC will determine if the data are useable.
The Applicant will conduct an investigation of the site called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;

2) Identify the source(s) of the contamination;

3) Assess the impact of the contamination on public health and the environment; and

4) Provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submitted a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the Site is a “significant threat,” it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the Site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a Site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the Site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the Site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a “Certificate of Completion” (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”. The Remedial Work Plan describes the Applicant’s proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Wendi Zheng
Project Manager
NYSDEC Region 2
Division of Environmental Remediation
1 Hunters Point Plaza
Long Island City, New York 11101
Phone: (718) 482-7541

Thomas V. Panzone
Citizen Participation Specialist
NYSDEC Region 2
1 Hunters Point Plaza
Long Island City, New York 11101
Phone: (718) 482-4953

New York State Department of Health (NYSDOH):

Melissa Doroski
Project Manager
NYSDOH
Empire State Plaza
Corning Tower Room 1782
Albany, NY 12237
Phone: (518) 402-7860
Email: BEEI@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

New York Public Library - Woodstock
761 East 160th Street, Bronx, NY
Attn: Corey Rodriguez
Phone: (718) 665-6255
Hours: 10AM–7 PM Monday–Thursday
10AM–5 PM Friday–Saturday

NYSDEC Region 2
1 Hunters Point Plaza
Long Island City, New York 11101
Attn: Wendi Zheng
Phone: (718) 482-7541
Hours: (call for appointment)

Bronx Community Board 2
Dr. Ian Amritt, Chairman
Ralph Acevedo, District Manager
Roland Lopez, Environmental Committee Chairman
1029 E. 163rd Street, Suite 202
Bronx, NY 10459
Phone: (718) 328-9125
Hours: 9am to 5pm, Monday-Friday

Appendix B - Site Contact List

Hon. Charles Schumer
United States Senate
780 Third Avenue, Suite 2301
New York, NY 10017

Hon. Kirsten E Gillibrand
United States Senate
780 Third Avenue, Suite 2601
New York, NY 10017

Vacant
NYS Senate
900 Rogers Place
Bronx, NY 10459

Hon. Carmen E. Arroyo
New York State Assembly, District 84
384 East 149 Street, Suite 301Bronx,
NY 10455

Congressman Jose E. Serrano
U.S. House of Representatives
District 15 – New York Office
1231 Lafayette Ave, 4th Floor
Bronx, NY 10474

Hon. Scott Stringer
NYC Comptroller
1 Centre Street
New York, NY 10007

Hon. Letitia James
Public Advocate
1 Centre Street, 15th Floor
New York, NY 10007

Hon. Ruben Diaz Jr.
Bronx Borough President
851 Grand Concourse #915
Bronx, NY 10451

Bronx Community Board 2
Dr. Ian Amritt, Chairman
Ralph Acevedo, District Manager
Roland Lopez, Environmental
Committee Chairman
1029 E. 163rd Street, Suite 202
Bronx, NY 10459

Mayor Bill de Blasio
City Hall
New York, NY 10007

Hon. Rafael Salamanca Jr.
New York City Council District 17
1070 Southern Boulevard
Bronx, NY 10459

Mitchell J. Silver, Commissioner
New York City Department of Parks &
Recreation
The Arsenal- Central Park
830 Fifth Avenue
New York, NY 10065

Marisa Lago, Director
NYC Department of City Planning
120 Broadway, 31st Floor
New York, NY 10271

Local News Media from which the Community typically obtains information:

New York Post
1211 Avenue of the Americas
New York, NY 10036
Phone: 212-930-8000

The Bronx Chronicle
25 Westchester Sq., Suite 1
Bronx, NY 10462
Phone: 347-224-7635

Spectrum NY 1 News
75 Ninth Avenue
New York, NY 10011

Hoy Nueva York
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

Hunts Point Express
Email:
news@huntspointexpress.com

El Diario La Prensa
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

New York Daily News
4 New York Plaza
New York, NY 10004

Bronx Times Reporter
900 East 132nd Street
Bronx, NY 10454

Bronx News
135 Dreiser Loop
Bronx, NY 10475

The Public Water Supplier which services the area in which the Property is located:

Vincent Sapienza, Commissioner
New York City Department of Environmental Protection
59-17 Junction Boulevard
Flushing, NY 11373

The Administrator of any School or Day Care Facility located on or near the Property:

La Peninsula Community Organization, Inc.
711 Manida St
Bronx, NY 10474
Mailing address:
1054 Intervale Avenue
Bronx, NY 10459

Public School 048: Joseph R. Drake
Principal, Dwayne D'Avilar
1290 Spofford Ave
Bronx, NY 10474

St.Ignatius School
President, Eavan O'Driscoll
740 Manida St
Bronx, NY 10474

John V Lindsay Wildcat Academy Charter School
Principal, Ronald Tabano
239 Lafayette Ave
Bronx, NY 10474

Hyde Leadership Charter School
Executive Director: Tom Sturtevant
730 Bryant Ave
Bronx, NY 10474

Sunshine Adult Social Center
Administrator, Ms. Waters
1241 Lafayette Ave
Bronx, NY 10474

Graham Windham Beacon (MS-424)
Principal, Dr. Steve Traversierre
730 Bryant Ave
Bronx, NY 10474

Community, Civic, Religious and Environmental Organizations

Corpus Christi Monastery
1230 Lafayette Avenue
Bronx, NY 10474

Hunts Point SDA
Attn: Pastor
700 Coster Street
Bronx, NY 10474

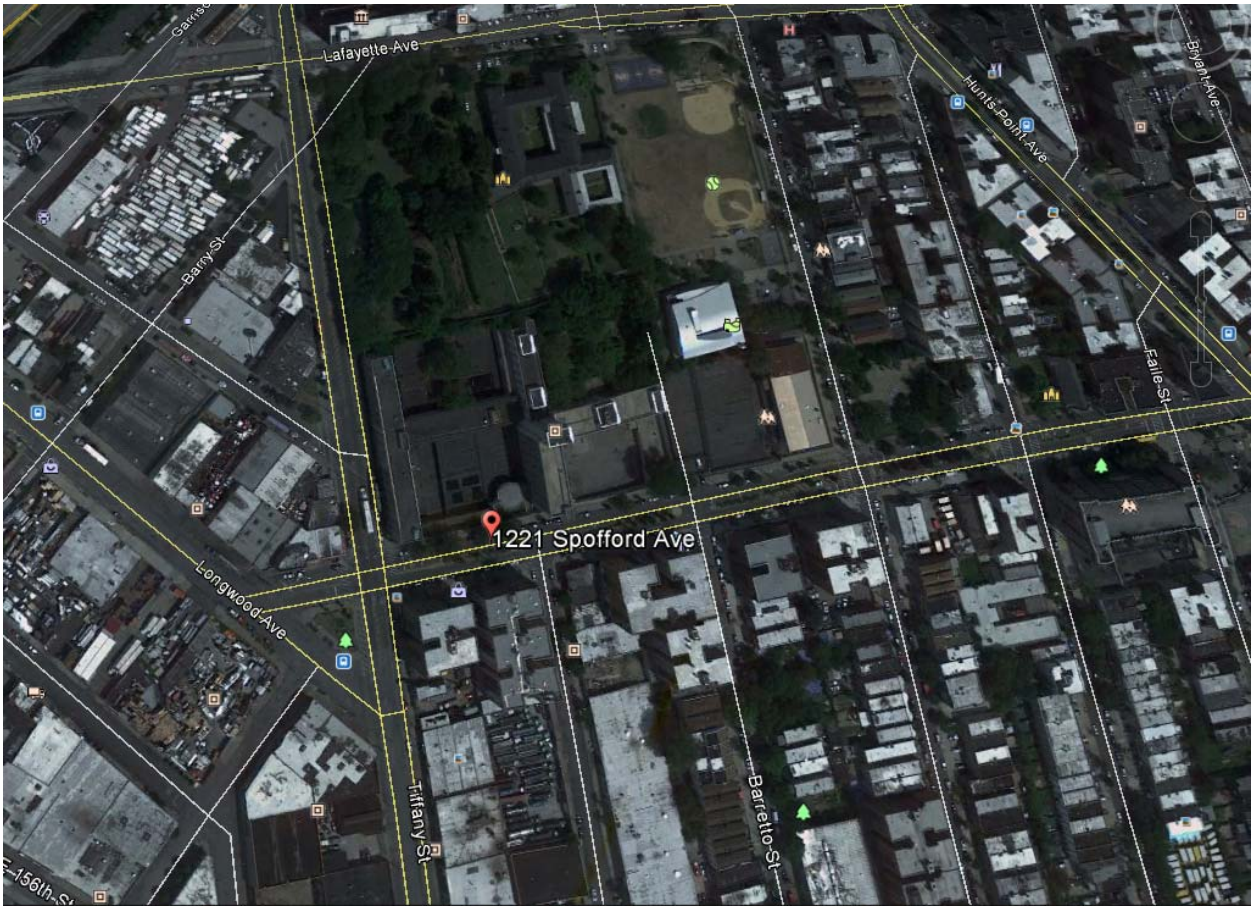
Hunts Point Recreation Center
Attn: Director
765 Manida Street
Bronx, NY 10474

Hunts Point
Economic Development Corporation
355 Food Center Drive
Suite C-104
Bronx, New York 10474

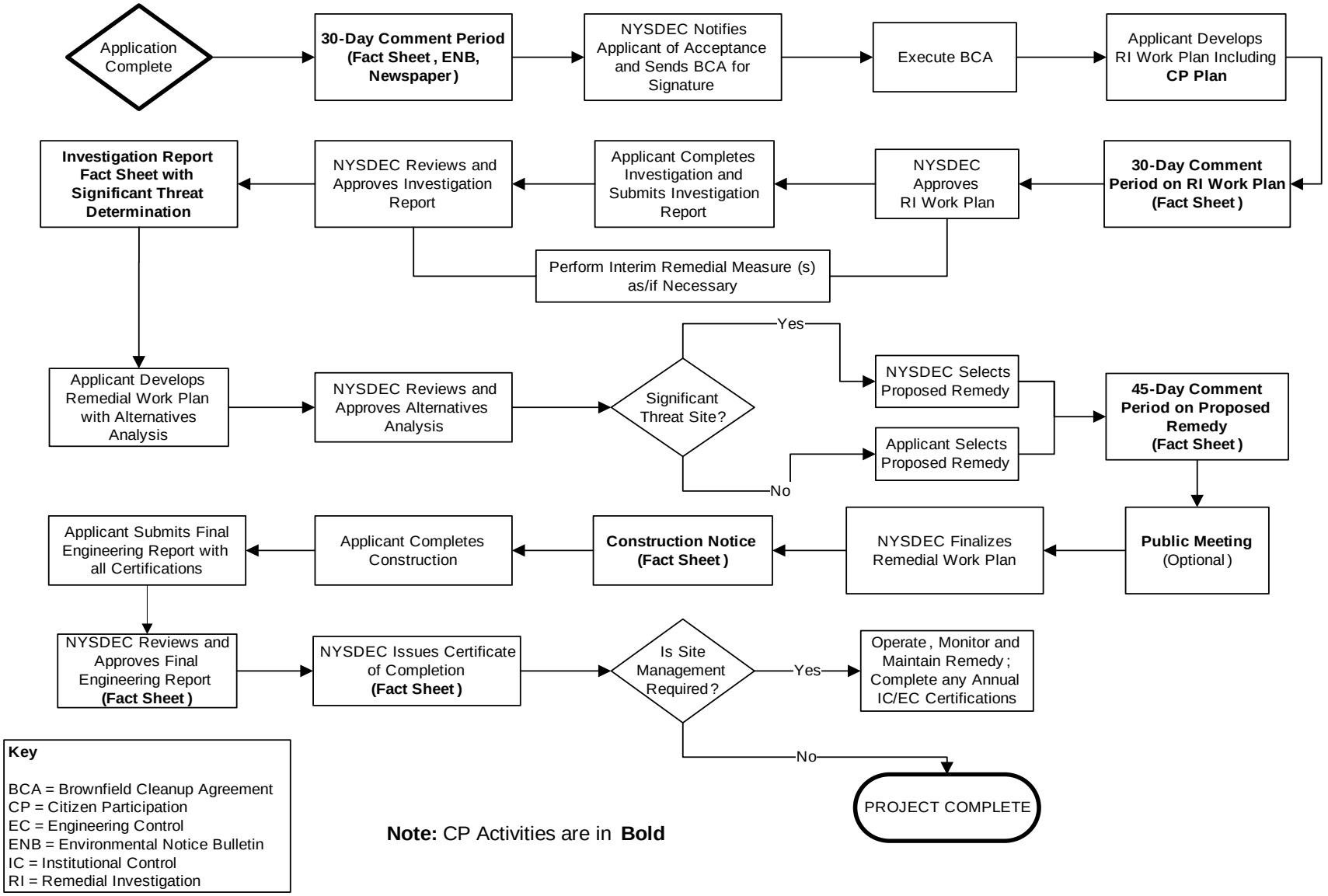
Maria Torres, President
The Point Community Development Corp
940 Garrison Avenue
Bronx, NY 10474

Hunts Point Awareness Committee
726 Coster Avenue
Bronx, NY 10474

Appendix C - Site Location Map



Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**

Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern

Site Name: The Peninsula

Site Number: C203097

Site Address and County: 1221 Spofford Avenue, Bronx

Remedial Party(ies): The Peninsula, JV, LLC.

Note: For Parts 1. – 3. the individuals, groups, organizations, businesses and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and information needs. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**

Environmental Justice
The BCP Site is also within the evaluation area for the NYC EDC Hunts Point Vision Task Force.

How were these issues and/or information needs identified?
Through review of documentation and City Environmental Quality Review (CEQR).

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.
NA

How were these information needs identified?
NA

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
Potential Hazards from Proposed Construction, and see contact list and issues identified in CPP.

How were these issues and/or information needs identified?
CEQR Process.

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning at and around site:
☒ **Residential** ☐ **Agricultural** ☐ **Recreational** ☒ **Commercial** ☒ **Industrial**

b. Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

c. Population density around site:
☒ **High** ☐ **Medium** ☐ **Low**

d. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

e. Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

f. Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☒ **Yes** ☐ **No**

h. Special considerations:
☒ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h:**
Over 75% Hispanic.

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in Part 2. of the Citizen Participation Plan under 'Site Contact List'. Are *other* individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☒ **Non-Adjacent Residents/Property Owners:** Click here to enter text.

☒ **Local Officials:** Click here to enter text.

☒ **Media:** Click here to enter text.

☒ **Business/Commercial Interests:** Click here to enter text.

☐ **Labor Group(s)/Employees:** Click here to enter text.

☐ **Indian Nation:** Click here to enter text.

☒ **Citizens/Community Group(s):** Click here to enter text.

☒ **Environmental Justice Group(s):** Click here to enter text.

☐ **Environmental Group(s):** Click here to enter text.

☒ **Civic Group(s):** Click here to enter text.

☐ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

Prepared/Updated By: Frank Cherena **Date:** 11-21-2017

ReviewedApproved By: Thomas V. Panzone, NYSDEC **Date:** 1-17-18

APPENDIX F

Resumes of Key Personnel

ROUX

PROFESSIONAL PROFILE

Brian P. Morrissey, P.E., BCEE
Principal Engineer

TECHNICAL SPECIALTIES

Development, design and implementation of soil and groundwater remediation systems.

Optimization of ongoing remedial operations.

Development of project and regulatory closure strategies.

Management, support, and oversight of large inter-disciplinary teams for site remediation.

Preparation of feasibility studies, engineer's reports, design drawings, specifications, contract documents, permit applications, cost estimates, operations and maintenance plans and construction management for the following:

- *In situ* groundwater remedial technologies
- Sub-slab depressurization systems
- Industrial and sanitary wastewater treatment systems
- Floating product recovery systems
- Ground water pumping and treatment facilities
- Water supply, treatment, and distribution
- Underground storage tank (UST) systems
- Containment systems
- Air sparging, soil vapor extraction and vapor collection and treatment systems
- Building decontamination and decommissioning
- Landfill cap design and permitting
- Hazardous waste soils removal, transportation, and disposal

EXPERIENCE SUMMARY

More than 30 years of experience working in many areas of the environmental industry under a variety of regulatory programs such as Federal and State Superfund, New Jersey ECRA/ISRA, NYSDEC Voluntary Cleanup, Petroleum and Chemical Bulk Storage, and NYC Brownfields.

Principal Engineer and Office Manager at Roux.; Senior Engineer and Senior Project Manager at ERM.

CREDENTIALS

B.E., Civil Engineering, Cooper Union, 1980
M.S., Civil and Environmental Engineering, NYU Tandon School of Engineering (former Polytechnic), 1985
Professional Engineer: New York (1986), New Jersey (2003), and Virginia (2010)
OSHA 40-hour Health and Safety Training
ExxonMobil Loss Prevention System certified
NYCOER Gold Certified Professional
Board Certified Environmental Engineer (BCEE) of the American Academy of Environmental Engineers and Scientists - Specialty Certification in Hazardous Waste Management, 1995

PROFESSIONAL AFFILIATIONS

Water Environment Federation

KEY PROJECTS

- Principal Engineer and Project Manager for the remediation and monitoring of over 100 vehicle fueling sites in New York City with UST petroleum releases. The remediation systems at the various sites include multi-phase extraction (MPE), soil vapor extraction (SVE), air sparging, groundwater recovery and treatment, and automated product-only recovery systems. Priorities on this multi-year contract included expediting remedial progress, increasing the effectiveness of operating systems, achieving NFA status, and reducing NYC's overall program costs. The work included conducting soil vapor studies at 9 sites to assess vapor intrusion concerns. Roux Associates also implemented *in situ* injections at 14 sites to cost-effectively achieve site closure. The *in situ* injections utilized chemical oxidation and bioremediation products including sodium percarbonate, oxygen generating compounds, hydrogen peroxide, petroleum-degrading bacteria, and nutrient/enzyme complexes.

- Principal Engineer for design upgrades and expansion of the groundwater depression and separate phase product recovery systems at former petroleum refinery in Brooklyn, New York. The site encompasses one of the nation's largest petroleum releases (18 million gallons). Key components included: the installation of 10 remote dual-pump free-phase product recovery wells, including wellhouse / control components and petroleum storage facilities; the construction of extensive underground utilities to connect remote recovery wells with two existing treatment systems; and modifications to existing groundwater treatment facilities to add auxiliary equipment to optimize treatment performance and system runtime. The work also involved the integration of control between the two separate groundwater treatment systems and all associated recovery wells into a single SCADA platform to improve operability. Also, redesigned building with new mezzanine and equipment layout to improve flow of the process treatment train.

- Principal Engineer for evaluation of remedial options at former electronics manufacturing plant in Taiwan. Prepared cost estimates for site remediation alternatives. Prepared Pilot Study Plan and presentation for Taiwanese regulatory officials on use of the *in situ* technologies of enhanced reductive dechlorination and chemical oxidation.

- Principal Engineer for the design of a vapor mitigation system for a 1.5 million square foot warehouse (former aircraft engine manufacturing plant) in New Jersey. The system design includes eight 40-HP blowers and over 600 vapor extraction wells to mitigate elevated levels of chlorinated solvents and petroleum compounds in the subsurface from migrating into the building.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2330
E-mail: bmorrissey@rouxinc.com | Website: http://www.rouxinc.com

Brian P. Morrissey, P.E., BCEE
Principal Engineer

- Principal Engineer for conducting detailed evaluation of problematic groundwater treatment system in Rensselaer, New York. Primary constituents of concern include heavy metals, chlorinated solvents, and BTEX compounds. Developed performance testing program, diagnosed causes of problems and presented several recommendations with cost estimates for upgrading systems and improving personnel health and safety. Prepared engineering report with key recommendations that included modifying equipment layout, injecting iron deposition and calcium scale control agents into water stream, facilitating carbon change-outs and upgrading the system instrumentation and controls.
- Principal Engineer for remediation of former petroleum terminal in Oceanside, New York. Managed preparation of Remedial Action Plan, community air monitoring plan, detailed design drawings, bid documents and O&M Plan. Conducted discussions/negotiations with NYSDEC and managed the annual budget for capital and operating expenses.
- Principal Engineer for the design of a soil vapor extraction (SVE) system to address elevated concentrations of methane and petroleum hydrocarbons in the shallow subsurface beneath three Operable Units of the project area. The major components of the design included the installation of 21 SVE wells and associated piping and instrumentation, the construction of a new treatment building to house the SVE treatment equipment, as well as office space to support the remediation project; and the installation of a thermal / catalytic oxidation system to treat the soil vapor extracted from the SVE wells, and also the air stripping and aeration process streams from a nearby groundwater treatment facility. The SVE treatment system was designed to accept up to 4,000 cfm of process air to meet the discharge requirements of 6 NYCRR, Part 201 and NYSDEC DAR-1 guidelines. All activities were performed under the oversight of the NYSDEC and in compliance with a strict regulatory milestone schedule.
- Senior Manager for Remedial Design and Construction Oversight at federal Superfund site in Elmira, New York. The 33-acre site included several areas of concern where the soil and groundwater had been contaminated by several types of hazardous wastes. Managed preparation of design submittals to USEPA Region II in accordance with CERCLA guidelines. The soil/sediment remediation design included requirements for materials handling, dewatering and disposal. PCB wastes were required to be segregated and disposed of at a TSCA-permitted facility. The design required stabilization of certain wastes and the installation of a RCRA cap. The design included measures for control and treatment of dewatered fluids and stormwater during construction Groundwater remediation system includes 12 recovery wells, filtration units and two air strippers.
- Principal Engineer and P.E. of Record for the design and construction of a storm drainage and sanitary sewer project located in the area of a former petroleum terminal in Brooklyn, New York. Worked on several design modifications to obtain NYCDEP approvals. Work included construction of approximately 1,600 linear feet of RCP storm sewer and approximately 1,000 feet of ductile iron sanitary sewer with pipe sizes ranging from 12-inch diameter to 54-inch diameter. Also replaced approximately 220 feet of 20-inch cast iron water main. The construction required vibration monitoring during sheeting and operation and maintenance of a temporary dewatering treatment system.
- Project Manager for remediation of several gasoline service station sites in Westchester County and Long Island, New York. Developed design/build approach for fast-track implementation while complying with NYSDEC guidelines. Typical remedial systems include groundwater recovery and treatment, soil vapor extraction and air sparging, and vapor treatment.
- Principal Engineer for an underground utility construction project for the expansion of a large groundwater treatment operation. Project included excavation and installation of over 3,500 linear feet of water main, product pipeline and control conduits within NYC streets.
- Provided engineering evaluation of options for UST repair/replacement at major railroad yard in Sunnyside, Queens, New York to address relocation needs and comply with NYSDEC tank regulations. Worked on preparation of UST upgrade work plan, cost estimates and contract documents.
- Principal Engineer for a building decommissioning and demolition project at an active railroad facility in Sunnyside, Queens, New York. Project included preparation of demolition specifications, collection of waste characterization soil and water samples, air monitoring, removal and disposal of impacted soil, removal and disposal of asbestos containing material, removal and disposal of demolition debris, and preparation of a demolition completion report.
- Project Manager for remediation of industrial airport site in Millville, New Jersey under ECRA/ISRA programs. Managed planning, detailed design and permitting activities required to replace 1,000-gpm public supply well impacted by extensive chlorinated solvent plume. Also managed the conceptual planning, permitting and final design of the 200-gpm groundwater recovery, treatment and recharge system that includes ultraviolet light/hydrogen peroxide system controlled by PLCs. This project won the annual Honor Award granted by the American Academy of Environmental Engineers and Scientists.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2330
E-mail: bmorrissey@rouxinc.com | Website: http://www.rouxinc.com

Brian P. Morrissey, P.E., BCEE
Principal Engineer

- Project Manager for the design of wastewater treatment plant (WWTP) upgrades at three (3) separate facilities under the program to protect New York City's watershed. The work included preparing conceptual upgrade plans, facility plans, detailed cost estimates, design drawings and specifications, startup plans, O&M plans, and oversight of construction. Design at one facility included replacement of secondary treatment components and the addition of recirculating sand filters, microfiltration units, emergency generator and telemetry systems.
- Design Manager for groundwater recovery and treatment system at a former manufactured gas plant (MGP) in Atlantic Highlands, New Jersey. Developed specification for implementation of directional drilling under state highway to expand groundwater recovery system to capture off-site contamination. Treatment system design included PLC-based control software that significantly reduced on-site staffing needs. Also, managed construction phase, negotiated/reduced change orders and worked with several subcontractors to meet tight regulatory agency schedule for system start-up. The system removes cyanide, metals, VOCs, and free-phase product.
- Project Manager for upgrading industrial process wastewater treatment system at medical products manufacturing facility in Hancock, New York. The upgraded system removes VOCs and metals, including lead, zinc, and copper, from highly variable waste streams generated by the manufacture of surgical instruments. Prepared design documents for automated system that allows for expected future increase in plant manufacturing capabilities. Also, prepared O&M plan for the treatment system.
- Project Manager for tank replacement program and automation of fueling system for commuter railroad at sites in New York City and Westchester County. Fueling facilities were designed in compliance with federal and state UST regulations.
- Senior Engineer for preparing and certifying Spill Prevention Control and Countermeasure (SPCC) Plans for 25 U.S. Postal Service facilities.
- Project Manager for remediation of several US Postal Service sites. Prepared site-specific HASP and Work Plans for removal of USTs and characterization of impacted soils. Supervised field personnel during investigative and construction phases of work. Also, prepared designs for new double-walled UST systems.
- Project Engineer for environmental audits at approximately 20 commercial and manufacturing facilities aimed at evaluating compliance with federal, state, and local air, wastewater, and hazardous waste regulations. Audits addressed regulatory areas including RCRA, SARA, CWA, CAA, TSCA, and OSHA.
- Project Manager for planning, permitting, design and construction oversight of 12,000-foot sewer system for the collection of sanitary and industrial wastewater in Melville, New York. Sewer design included route selection, sizing of gravity sewers, provisions for utility crossings, solar powered flow meters, grease interceptor, pump station for one branch line, and proper abandonment of leaching facilities. Project also included installation of two 20,000-gallon underground storage tanks and a tanker truck fill area with secondary containment. The final phase of the project consisted of the addition of an industrial waste pretreatment system utilizing pH adjustment, filtration, and a bioreactor tank. This project provided a safe and reliable wastewater disposal system and eliminated a costly 40,000-gallon per day hold and haul system.
- Project Manager for the planning and design of irrigation system using treated wastewater in the Catskills area. Conducted study on acceptable uses of wastewater treated by tertiary methods in accordance with federal and New York State guidance.
- Project Engineer, prepared feasibility study for state Superfund site of former manufacturer of printing inks and ribbons in Glen Cove, New York. Elevated levels of toluene, xylenes, ethylbenzene, and benzene were detected in on-site soils above soil cleanup objectives (SCOs) for the protection of groundwater. Evaluated ground water and soil remediation technologies. After approval of FS by NYSDEC, managed the final design, construction oversight, and startup phases of the project. Remedial system included 30 variable speed controlled recovery pumps, filtration, iron sequestration, tray aeration, soil vapor extraction, and vapor treatment via catalytic oxidation.
- Principal Engineer for development of innovative approach for remediation and reuse of federal Superfund site in Plaistow, New Hampshire. Prepared cost estimates for approaches aimed at reducing project costs by utilizing alternate treatment technologies and maximizing efficiency of existing system. Phased approach for site includes hot spot soil removal, enhancements of existing remedial system, implementing air sparging with SVE and follow-up with polishing step of *in situ* bioremediation. This alternative plan would achieve environmental restoration of site and is tailored to anticipated re-development of land.
- Principal Engineer for the design of modifications to an active sub-slab depressurization system (SSDS) to mitigate chlorinated solvent soil vapor contamination beneath an existing occupied shopping mall in the Bronx, New York. Worked on coordination and troubleshooting of construction issues. Managed the system testing and start-up and provided recommendations to improve system operation.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2330
E-mail: bmorrissey@rouxinc.com | Website: http://www.rouxinc.com

ROUX

PROFESSIONAL PROFILE

Dana M. Hignell

Senior Engineer

TECHNICAL SPECIALTIES

Engineering services for the investigation, design, construction, and operation and maintenance of remedial systems for the treatment of contaminated soil, sediment, and groundwater. Remedial designs have included excavation, groundwater pump and treat systems, air sparging with soil vapor extraction, vapor barriers and sub-slab depressurization systems, and landfill soil cover systems.

EXPERIENCE SUMMARY

Eighteen years of experience: Staff, Project, and Senior Engineer with Roux Associates, Inc.

CREDENTIALS

B.S., Chemical Engineering, Cornell University, 2000.

OSHA 40 hour Health & Safety Course, 2000.

OSHA 8-hour Health & Safety Refresher Course, 2000-Present.

KEY PROJECTS

- Senior Engineer for the design and implementation of a passive product-recovery system using horizontal recovery wells at a former bus garage in Newark, New Jersey. The remedial action also included excavation and offsite disposal of approximately 7,000 tons of petroleum contaminated soil, and in-situ chemical oxidation to treat residual soil and groundwater contamination.

- Senior Engineering managing the investigation, design and implementation of product-recovery skimming systems for a former petroleum refinery in Queens, New York. Approximately 80,000 gallons of product has been recovered to date.

- Senior Engineer for the design of a sub-slab depressurization system with vapor barrier for the construction of a 19 story residential building in Brooklyn, New York.

- Senior Engineer for the investigation, design and implementation of a soil remediation project at a Former Oil Terminal in Sag Harbor, New York. The remedy completed includes excavation and offsite disposal of approximately 2,000 tons of petroleum contaminated soil in an active roadway surrounded by underground utilities.

- Senior Engineer for the investigation, design, and implementation of a soil remediation project at a 4-acre Former Oil Terminal in Cold Spring Harbor, New York. The remedy completed includes excavation and offsite disposal of approximately 20,000 tons of petroleum contaminated and/or hazardous lead contaminated soil in accordance with the future use of the site under an Environmental Easement. Additional activities completed at the site included asbestos remediation followed by building demolition, UST removal, and cesspool remediation.

- Project Engineer for the complete design for a 9-acre landfill in Rensselaer, New York as part of the NYSDEC Voluntary Cleanup Program. The design was in accordance with the future use of the Site as a landfill with an integrated wildlife habitat vegetative cap and included hot spot soil excavation and installation of a vegetative cap.

- Project Engineer for the design of a soil and groundwater remediation system for a Former Oil Terminal in Oceanside, New York. A risk-based remedial approach that called for the remediation of "hot spot" source area soils, and mass-reduction of VOCs in groundwater was successfully utilized for the Site. To address the soil contamination in the source areas, "hot spot" soil excavation was completed. A groundwater pump and treat system was designed, constructed, and continues to be operated and maintained to address the VOC contaminants in groundwater. The system consists of 7 recovery wells, an oil/water separator, and a packed column air stripping tower. Over 11 million gallons of groundwater have been recovered and treated.

- Project Engineer for the design and start up of a soil vapor extraction (SVE) and air sparge (AS) system at an 11-acre active Oil Terminal in Glenwood Landing, NY. The system was installed to address soil and groundwater contaminants and consists of 4 horizontal SVE wells and 8 AS wells. The recovered soil vapor is treated by carbon units before being discharged. Approximately 12,000 pounds of hydrocarbon have been recovered since system start up.

- Project Engineer for the design and start up of a soil vapor extraction (SVE) and air sparge (AS) system at an 11-acre active Oil Terminal in Inwood, NY. The system was installed to address soil and groundwater contaminants and consists of 4 vertical SVE wells and 6 AS wells. The recovered soil vapor is treated by carbon units before being discharged. Approximately 32,000 pounds of hydrocarbon have been recovered since system start up.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2329
E-mail: dhignell@rouxinc.com | Website: http://www.rouxinc.com

Dana M. Hignell
Senior Engineer

Operation and Maintenance (O&M) Experience:

- Project Engineer responsible for the O&M and monitoring of a SVE system and a dual-pump, product-recovery system at an active Oil Terminal in Inwood, New York. O&M activities included system operation and maintenance, performance monitoring, and preparation of quarterly status reports for submission to the NYSDEC. The SVE system consists of 5 SVE wells and was designed, constructed, operated and maintained for a period of approximately 6 years. The SVE system was permanently shut down and this area of the Site is currently in the post-remediation monitoring phase. The dual-pump system, including groundwater and product recovery and packed column air stripping towers, is currently still in operation.

- Project Engineer responsible for the operation and maintenance of soil and groundwater remediation systems for an active Oil Terminal in Glenwood Landing, New York. A groundwater pump and treat system, consisting of 1 recovery well, two packed column air stripping towers, bag filters and granular activated carbon units, has been in operation at the Site to address VOC contaminants in groundwater. In addition, a SVE/AS system, previously installed, was upgraded to further address soil and groundwater contaminants at the Site boundaries. The SVE system consisted of vertical wells in an area of shallow groundwater. The system was upgraded with 7 horizontal wells and an additional 5 AS wells were installed. Following an on-site diesel spill of approximately 5,000 gallons in 2005, free-product recovery efforts were implemented, including removal of saturated soils and installation of a free-product recovery system.

- Staff Engineer responsible for the O&M and monitoring of a SVE/AS system for nationwide distribution center in Brooklyn, New York as part of the NYSDEC Voluntary Cleanup Program. O&M activities included system operation and maintenance, performance monitoring, soil gas monitoring, quarterly monitoring, and preparation of quarterly and annual status reports for submission to the NYSDEC. The SVE and AS system consists of 8 SVE wells and 17 AS wells and was designed, constructed, operated and maintained for a period of approximately 3 years. The SVE and AS system is permanently shut down and the Site is currently in the post-remediation monitoring phase.

- Staff Engineer responsible for the O&M of a 430-gpm, dual-pump, product-recovery system in Greenpoint, Brooklyn, New York. Processes and system maintained include dual-pump ground-water and product recovery, low profile air strippers and a catalytic oxidation unit. The Site encompasses one of the nation's largest petroleum releases (18 million gallons).

UST Experience:

- Project Engineer for the management of the excavation and removal of a 10,000-gallon UST and four ASTs ranging from 284,000-gallon capacity to 976,000-gallon capacity at a former Oil Terminal in Cold Spring Harbor, New York. The scope of work entailed preparation of a UST and AST closure work plan, project management of the field work, post-excavation and tank footprint sampling and preparation of a UST and AST Closure Report.

- Project Engineer for the excavation oversight of a 2,000-gallon heating oil UST at an active Oil Terminal in Glenwood Landing, New York. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report.

- Project Engineer for the excavation oversight of a 2,000-gallon heating oil UST at an active Oil Terminal in Inwood, New York. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report. Also included was the management and field oversight of the closure of an in ground oil/water separator at an active Oil Terminal Inwood, New York. The scope of work entailed preparation of an oil/water separator closure work plan, project management of the field work, excavation of petroleum contaminated soils associated with the separator, post-excavation sampling, and preparation of an Oil/Water Separator Closure Report.

- Staff Engineer for the excavation oversight of three 8,000-gallon USTs, two pump islands and three hydraulic lifts and all associated piping at a former service station in Norwalk, Connecticut. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2329
E-mail: dhignell@rouxinc.com | Website: http://www.rouxinc.com

Dana M. Hignell
Senior Engineer

- Staff Engineer for the excavation oversight of three 8,000-gallon USTs, two pump islands and all associated piping at a former service station in Hartford, Connecticut. Field oversight included post-excavation and waste characterization soil sampling, health and safety monitoring, supervision during the removal, cleaning, and disposal of the USTs and preparation of a Closure Report.

Soil and Groundwater Remediation:

- Project Engineer for the design of soil remediation at an active Oil Terminal in Stamford, Connecticut to remove contaminated soils following a 30,000-gallon petroleum spill in 2006. The remediation included excavation of approximately 1,000 cubic yards of petroleum-impacted soil with post-excavation sampling.

- Staff Engineer responsible for construction management of remediation of a former major pharmaceutical plant located in Hicksville, New York as part of the State Superfund Program. The project consisted of the excavation of non-hazardous soil from 5 on-site drywells and a former waste disposal area, implementation of a community air monitoring plan, coordination with the Long Island Rail Road (LIRR) for work performed within the LIRR's right of way, steel sheeting installation and removal, backfilling, monitoring well abandonment and replacement, transportation and disposal of 3,300 tons of VOC, SVOC and metal contaminated soil, and restoration of approximately 9,800 square feet of asphalt. A 7-foot diameter steel caisson was used to support the deeper excavation required at the invert of two drywells. This innovative approach saved the client approximately $50,000 in costs that would have been incurred by using a traditional steel sheeting support system to protect the on-site commercial building.

Stormwater:

- Project Engineer for the design and construction management of a stormwater drainage upgrade project for the parking lot of a former manufacturing facility (costume jewelry and then surgical needles) located in Queens Village, New York. The storm-water drainage system consisted of multiple catch basins, a new drain and curb, and all associated piping.

- Project Engineer for the design and construction of two stormwater management ponds and swales for a former landfill in Rensselaer, New York. The ponds and swales were constructed as part of the landfill cap project to direct stormwater to existing catch basins, allow stormwater overflow control and to enhance the wildlife habitat.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2329
E-mail: dhignell@rouxinc.com | Website: http://www.rouxinc.com

ROUX

PROFESSIONAL PROFILE

Frank Cherena
Principal Geologist

TECHNICAL SPECIALTIES

Project Management and Field Management of Phase I and Phase II Environmental site assessments. GIS data analysis and mapping. Project Management and oversight of remediation and construction activities. Additional experience includes the performance of investigation design and agency correspondence for petroleum and chlorinated solvent remediation projects.

EXPERIENCE SUMMARY

Fifteen years of experience: Principal Geologist with Roux Associates, Inc., Islandia, New York; Staff Geologist with RTP Environmental Associates, Inc., Green Brook, New Jersey.

CREDENTIALS

B.A., Geology, Colgate University, 2003
OSHA 40-Hour Hazardous Materials Training, 2003
OSHA 8-Hour Supervisor Training, 2004
Accredited AHERA Inspector, 2004
State of New York Asbestos Inspector Certificate, 2004
NJ UST Subsurface Evaluator Certification# 491925, 2009

KEY PROJECTS

- Principal in charge of large university tech development project in New York City. The project consists of the demolition and decommissioning of a former hospital building, and excavation for redevelopment of four separate buildings for the first phase of campus construction. Environmental considerations on the project included site assessment, remediation design and oversight, SDPES permitting (construction dewatering and geothermal well discharge), soil characterization for reuse and capping of soils. Coordinated with NYCDEP, and other project stakeholders concerning community protection and monitoring concerns.
- Principal in charge of redevelopment of shopping mall in Staten Island, New York. The Site will consist of the construction of two commercial out parcel buildings, a new parking deck, and an expansion of the existing mall building. Areas of concern include historical fill, site-wide soil contamination (arsenic and pesticides). In addition, also responsible for agency coordination with FDNY, NYSDEC, and NYCOER for mitigation of methane and chlorinated volatile organic compounds vapor issues.
- Principal in charge for new development of a large regional mall in Norwalk, Connecticut with underground parking. The proposed redevelopment will result in the construction of a retail shops, restaurants, hotel, and entertainment. Previous usage of the property included over 30 different parcels including three establishments, gasoline filling stations, fuel oil terminal storage, hazardous waste disposal areas. The project includes investigation and subsequent remediation of petroleum and hazardous waste releases, filing of the Environmental Conditions Assessment Form (ECAF) associated with the three transfer act parcels
- Project Manager for the largest redevelopment project in New York City (over $4.5 billion). Project includes Phase I and Phase II ESAs (investigation of soil, groundwater, and soil vapor) at over 75 properties; Construction support for excavation of one million cubic yards of soil including implementing an in situ waste characterization program; Environmental support for demolition, asbestos and lead abatement, site remediation using In Situ Chemical Oxidation, and relocating of an active 9-acre 100-year old railyard; Property acquisition support throughout the project (7 city blocks); and Agency support for NYSDEC, NYCDEP, MTA (LIRR/NYCT), and ESDC. The environmental data was used as an integral component of the New York State Environmental Quality Review Act (SEQRA) final Environmental Impact Statement (EIS). The project will encompass 336,000 sq ft of office space, 6.4 million sq ft of residential space, an 18,000 seat sports and entertainment venue - the Barclays Center (home of the Nets professional basketball team) - 247,000 sq ft of retail space, a 165,000 square-foot hotel, and over 8 acres of intricately designed publicly accessible open space.
- Principal in Charge of numerous due diligence projects for owners, developers, managers, municipalities, and lenders at commercial and industrial properties throughout the Northeast. Activities included performance of UST evaluations and closures, hot spot remediations, Phase I and Phase II Site Assessments, vapor intrusion studies and mitigation, lead based paint, asbestos and hazardous materials surveys, interaction with regulatory agencies on behalf of clients and development of remedial cost estimates for planning and negotiation.
- Principal in Charge for investigation and review of a former electroplating facility in Bay Shore, New York with chlorinated solvent DNAPL. Activities included historical document review, subsurface investigation, and coordination with outside legal counsel and NYSDEC.
- Implemented GIS analysis and mapping for a remedial study and alternative analysis report (AAR) for an active petroleum storage terminal in Buffalo, New York under jurisdiction of the NYSDEC. The AAR required spatial analyses in order to categorize and analyze contaminant data from multiple investigations, investigate remedial alternatives, and to help focus ongoing additional investigations.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2388
E-mail: fcherena@rouxinc.com | Website: http://www.rouxinc.com

Frank Cherena
Principal Geologist

- Project manager for a property transfer support project at a heavily contaminated state-of-the-art distribution facility in the Bronx, New York. The site was a former MGP being handled under the VCP in central office, the site had an open spill under the regional spills group and the site was attempting to apply to the BCP through the regional office. Roux performed a Phase I for the buyer, a Phase II and remedial cost estimate for the owner and negotiated with the buyer's consultant and NYSDEC to limit the scope of the investigation and cleanup.
- Served as Environmental Professional on hundreds of Phase I Environmental Site Assessments according to ASTM E1527-00, ASTM E1527-05, and ASTM E1527-13 for due diligence of large retail shopping centers, industrial facilities, and office buildings. Associated activities included agency contact, database management and interpretation, report preparation, and recommendations for additional work.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2388
E-mail: fcherena@rouxinc.com | Website: http://www.rouxinc.com

ROUX

PROFESSIONAL PROFILE

Jeffrey Wills
Senior Hydrogeologist

TECHNICAL SPECIALTIES

Design, implementation, and management of remedial investigations and Phase II ESAs. New York State Brownfields Cleanup Program; New York City Office of Environmental Remediation Voluntary Cleanup Program; and New York State Inactive Hazardous Wastes Site Program and Spills.

EXPERIENCE SUMMARY

12 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-Alleghenian Deformation of the Shawangunk Ridge in New York and New Jersey*, 2005

OSHA 40-Hour HAZWOPER Training: 2006

OSHA 8-Hour Refresher: 2017

OSHA 10-Hour Training: 2018

Loss Prevention Systems Training Certification: 2008

Loss Prevention Systems Training Refresher: 2014

KEY PROJECTS

- 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.
- 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 investigation, remedial investigations (soil, groundwater and soil vapor), site-wide in situ waste characterization sampling program and a Remedial Action Work Plan and management of soil excavations.
- Project Manager for a 13 acre 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.
- Project Manager for a former dry cleaner site 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.
- Field 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.
- Field 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.
- Project Hydrogeologist responsible for the management of investigation and remediation at various mixed development sites containing hazardous and non-hazardous soils in New York City. These projects included the implementation of Remedial Investigations, in situ waste characterization sampling program and a Remedial Action Work Plan, 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 (NYC OER) and Brownfield Cleanup Program (BCP).
- 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

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2366
E-mail: jwills@rouxinc.com | Website: http://www.rouxinc.com

Jeffrey Wills
Senior Hydrogeologist

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 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.

- Field 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.
- Field Investigations Manager for Phase II Remedial Investigations associated with petroleum contamination at a 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.
- Field 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.
- Site/Field 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.
- Field 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 affiliated piping.
- Field manager for several enhanced bioremediation programs at NYPD precincts and NYC Parks facilities, which included the installation of multiple oxygen releasing compound (ORC) injection point wells.
- Performed field investigations for petroleum contamination at FDNY Engine Company 243, New York, Responsibilities included location of former AST area, interviewing of FDNY employees, and gathering of historical records.
- Field manager for well decommissioning at various sites in Brooklyn, New York; Additional responsibilities included the preparation of well decommissioning logs for submittal to NYSDEC.
- Field manager for sub-slab soil vapor sampling at a factory in Deer Park, New York.
- Assisted in the collection of wall rinsate samples for a hazardous-waste Site in Brooklyn, New York.

209 Shafter Street | Islandia, NY 11749
Main: (631) 232-2600 | Direct: (631) 630-2366
E-mail: jwills@rouxinc.com | Website: http://www.rouxinc.com

APPENDIX G

Vapor Barrier Specifications

TECHNICAL DATA SHEET

Air-Bloc® 31MR

Fluid Applied, Vapor Permeable
Air & Water Barrier Membrane

Typical Physical Properties

-Color	Gray
-Solids by Weight	60%
-Weight	10.8 lbs/gal (1.3 kg/l)
-Drying Time @50% R.H., +68°F (+20°C), Dry Substrate	2 Hours to touch dry 24 Hours to firm dry
-Service Temperature	-40°F to +158°F (-40°C to +70°C)
-Application Temperature	+40°F to +122°F (+4°C to +50°C)
-Tensile Strength ASTM D412	137psi (950 kPa)
-Elongation, % ASTM D412	1000%
-Peel Strength, to Dry Concrete ASTM C836	1327 lbf/ft (1.8 kN/m)
-Low Temperature Flexibility and Crack Bridging @ –20°C ASTM C836	Pass
-Aging-Long Term Flexibility CGSB 71-GP-24M	No fracturing
-Nail Sealability ASTM D1970	Pass
-Resistance to Mold, Mildew & Fungal growth ASTM D5590	-0- No Growth
-VOC Content	15 grams/liter, max

-Watertightness CAN/CGSB-37.58-M86	Pass
-Water Vapor Permeance ASTM E-96, proc. B @ 3mm (1/8") wet film	21 perms (1,201 ng/Pa.m^2.s)
-Air Permeability Testing ASTM E283, applied at 2.2 l/m^2 to CMU wall	
75Pa @ 70°F	0.00010 cfm/ft^2
250Pa @ 70°F	0.00014 cfm/ft^2
300Pa @ 70°F	0.00015 cfm/ft^2
ASTM E2357, Assembly Air Leakage Testing	Pass
ASTM E2178, @ 75Pa	0.0002 cfm/ft^2 (0.001 L/s.m^2)
-Resistance to Gust Wind Load	Meets Mass/Canadian code requirements for air leakage @ 3000Pa gust load suction pressure
-Chemical Resistance	Resists salt solutions, mild acids and alkalis. Non-resistant to oils, grease or solvents
-Fire Testing	Complies with NFPA 285 in various wall assemblies
-Flame Spread ASTM E84	15
-Smoke Developed ASTM E84	60

Reference Tests & Standards

ASTM E2357 Air Barrier Assembly Test	**ASTM D5590** Mold/Mildew/Fungus Resistant	**ABAA Accreditation**	**Massachusetts Commercial Energy Code** (780 CMR, Chapter 13)

Description

Air-Bloc® 31MR is a liquid applied, elastomeric membrane designed to provide a permeable air & water barrier when applied to above-grade wall assemblies. It is single-component, water-based and cures to a tough monolithic rubber-like membrane, which resists air leakage and water penetration. **Air-Bloc® 31MR** combines the proven performance of **Air-Bloc® 31MR** with the addition of Henry antimicrobial technology to create an integral mold resistant membrane.

Henry Company, 999 N. Sepulveda, Ste. 800 El Segundo CA 90245
Tel: 800-486-1278 **Email:** techservices@henry.com
www.henry.com

REV: 04/11/2013

Air-Bloc® 31MR Fluid Applied, Permeable Air and Water Barrier Membrane

Features

- Seamless, vapor permeable elastomeric membrane for above grade walls
- Easy, low cost spray application using simple equipment
- Integral mold resistant formulation
- High water vapor permeance provides “breather” characteristics
- Excellent adhesion to most construction surfaces such as exterior gypsum boards, CMU, concrete, stone, wood and metal
- Excellent adhesion to most wall construction surfaces -can be applied to damp concrete
- Meets highest industry performance standards

Product Sizes

5 gal pails, 55 gal drums

Uses

Air-Bloc® 31MR is used in construction of high performance wall assemblies requiring vapor permeability in an air & water barrier membrane. Integrated with **Blueskin®** flashing and accessories to form a complete wall system meeting highest industry performance standards. Commonly used on variety of wall substrates and sheathing prior to installation of exterior cladding.

Limitations

Must be protected from damage during construction. KEEP FROM FREEZING. Do not apply to wet surfaces. Not designed for permanent exposure to weather - protect as soon as possible, however can be exposed up to 3 months if necessary to accommodate construction scheduling.

Air-Bloc® 31MR shall not be applied when ambient (air) and substrate temperatures are below 40°F (5°C). The product should not be applied if it is raining, or if the possibility of rain is likely within 16 hours. The product should not be applied if it is expected that the ambient temperature will fall below 32°F within 48 hours. Following installation of **Air-Bloc® 31MR** in new building construction, CMU walls where product has been applied must be protected at the roof line to prevent water infiltration into the wall cavity.

In hot weather or direct-sun applications over porous substrates, such as concrete, rapid surface drying can form blisters. A thin ‘prime coat’ application to substrate, which is allowed to dry, often prevents blister formation in subsequent application. Alternatively a two coat application vs. single heavy coat – with back rolling of base coat – also aids in prevention of blistering in hot weather.

Surface Preparation

All surfaces must be sound, dry, clean and free of frost, oil, grease, dirt, excess mortar or other contaminants. New concrete should be cured for a minimum of 16 hours before **Air-Bloc® 31MR** is applied. Concrete surfaces should be free of large voids and spalled areas. Joints between panels of exterior grade gypsum, plywood and rigid insulation up to ¼” wide shall be filled with a trowel application of **Air-Bloc® 31MR** and reinforced with a strip of 2” wide glass fiber tape such as **Henry #183 Yellow Glass Fabric** prior to application of liquid membrane. Joints between panels of exterior grade gypsum or plywood wider than ¼” should be sealed with **Blueskin®** membrane adhered to the primed substrate (use **Blueskin® Primer** or **Henry #545 Aquatac™**) and lapped a minimum of 3” on both sides of the crack. Joints wider than ¼” between panels of rigid insulation are not permitted. Mortar joints on CMU walls should be struck flush with block surface. Cracks in masonry and concrete up to ¼” wide shall be filled with a trowel application of **Air-Bloc® 31MR** and allowed to cure overnight prior to application of the liquid membrane to the surface, or alternatively, the cracks may be sealed with a strip of **Blueskin®** membrane applied to the primed substrate (use **Blueskin® Primer** or **Henry #545 Aquatac™**). Cracks wider than ¼” should be sealed with **Blueskin®** membrane adhered to the primed substrate and lapped a minimum of 3” on both sides of the crack. Transition joints between two dissimilar materials at beams, columns, window and door frames, etc., should be sealed with strips of **Blueskin®** membrane, lapped a minimum of 3” on both substrates. Mechanical attachment should be made to all window and door frames, or a properly designed sealant joint should be provided.

Air-Bloc® 31MR Fluid Applied, Permeable Air and Water Barrier Membrane

Joint & Crack Treatment

Dynamic or expansion joint treatment must be in compliance with projects' architectural details and specifications.
Sheathing or Substrate Non-Moving Joint Treatment Options:
Note: apply per products' published Technical Data Sheets

Non-Moving Joint Width	Method #1 Sealant Method	Method #2 Fluid-Ap Method	Method #3 Self-adhered Sheet Method
Less than 6mm (1/4")	1. **HE 925 BES Sealant** 2. Fill and strike smooth 3. Allow to dry	1. Fill with **Air-Bloc® 31MR** by trowel, extending beyond joint line a minimum 75mm (3") onto face of substrate 2. Fully embed 50mm (2") minimum **Yellow Jacket** glass fiber reinforcing tape into wet **Air-Bloc® 31MR** – centered over joint.	1. Apply **Blueskin Adhesive**, **Blueskin LVC Adhesive or Aquatac** 2. Allow to dry 3. Apply self-adhered membrane and roll in place. Select One: Permeable option: • **BlueskinVP 160** Non-permeable option: • **Blueskin SA** • **Blueskin SA LT** • **Blueskin SA HT** • **Foilskin**
6mm (1/4") to 12mm (1/2")	Same As Above	Do Not Use	Same As Above

Application

Air-Bloc® 31MR may be applied by brush or roller, however application by conventional air assisted spray equipment in a single or dual-coat application is the preferred method. Apply in continuous, monolithic application without sags, runs or voids, transitioning onto flashing membrane to create a uniform drainage plane and air-barrier. Regularly monitor wet mil thickness during application to assure adequate coverage. The preferred method of application is to mark areas off and ensure that the appropriate volume has been sprayed over this area. During spraying, the material should be applied in horizontal strokes ensuring even application of the product, and then applied in vertical strokes, again ensuring even application. In areas where surface is not uniform, i.e., slightly rough with the presence of small indentations and recesses, an added over-spray should be performed. This over-spray should be sufficient to fill the voids, without excessive material application such that slumping or running of the material occurs.

Coverage Rates: Apply per published architectural specifications. Typical application rates include:

- **Smooth Surfaces** such as exterior gypsum sheathing or formed concrete: 4.25 gal US/ 100 ft^2 (1.7 l/m^2) to give a wet film thickness of approximately 70 mils (1.75mm), and a cured dry film thickness of 35 mils, depending on texture and porosity of surface
- **Rough Surfaces** such as CMU: 5.4 gal US / $100ft^2$ (2.2 l/m^2) to give a wet film thickness of approximately 90 mils depending on texture and porosity of surface

Application Equipment: Suggested Spray Equipment: Graco President 10:1 pump, Graco Mastic Gun 204-000 with ¼" round tip or similar equipment.

Protection of Finished Work: Air-Bloc® 31MR and **Blueskin®** are not designed for permanent exposure. Product is designed to withstand job site exposure for up to 3 months, however, good construction practice calls for covering as soon as possible. Wherever possible, begin covering membrane on south exposures, followed by remainder of surface. In cases where extended exposure periods are expected, use UV resistant **Henry Air-Bloc® 33MR** as an alternate.

Precautions

When transporting this product, be sure the container is secured and the lid is tight. Do not allow container to tumble as this may loosen the lid and allow leakage to occur. Avoid freezing during storage, application and before material has cured.

Clean Up

Spray equipment can be flushed out with water. Use mineral spirits to remove dried films.

Air-Bloc® 31MR Fluid Applied, Permeable Air and Water Barrier Membrane

Caution

DO NOT TAKE INTERNALLY! Close container after each use. Avoid breathing of vapors as it may cause respiratory tract irritation. Use protective measures to avoid contact with eyes and skin. If swallowed, **CALL PHYSICIAN IMMEDIATELY!** In case of eye contact, open eyelids wide and flush immediately with plenty of water for at least 15 minutes. In case of accidental injection by power spray equipment, **GET MEDICAL ATTENTION!** Dispose of container and unused contents in accordance with Local, State and Federal regulations. Do not heat container or store at temperatures greater than 120°F. **KEEP OUT OF REACH OF CHILDREN. FOR EXTERIOR USE ONLY. KEEP FROM FREEZING.**

WARNING: This product contains detectable amounts of chemicals known to the State of California to cause cancer, or birth defects or other reproductive harm.

Employers should obtain a copy of the **Material Safety Data Sheet (MSDS)** from your supplier or directly from Henry at the toll free number or website below.

Limited Warranty

We, the manufacturer, warrant only that this product is free of defects, since many factors which affect the results obtained from this product – such as weather, workmanship, equipment utilized and prior condition of the substrate – are all beyond our control. We will replace at no charge any product proved to be defective within 12 months of purchase, provided it has been applied in accordance with our written directions for uses we recommended as suitable for this product. Proof of purchase must be provided.
DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY: THIS LIMITED WARRANTY IS IN LIEU OF ANY OTHER WARRANTIES EXPRESS OR IMPLIED INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FOR A PARTICULAR PURPOSE. MANUFACTURER SHALL HAVE NO LIABILITY OF ANY KIND BEYOND PRODUCT REPLACEMENT, INCLUDING FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES RESULTING FROM ANY DEFECTS OR ANY DELAYS CAUSED BY REPLACEMENT OR OTHERWISE. THIS LIMITED WARRANTY PROVIDES THE PURCHASER'S EXCLUSIVE REMEDY FOR ANY DEFECT IN THE PRODUCT.

Contact Warranty Department at warranty@henry.com or location shown below for product or systems warranty information.

STATEMENT OF RESPONSIBILITY

The technical and application information herein is based on the present state of our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be made as to a product's suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products for their intended use. Henry Company data sheets are updated on a regular basis; it is the user's responsibility to obtain and to confirm the most recent version. Information contained in this data sheet may change without notice.

SECTION 072700

VAPOR PERMEABLE AIR BARRIER LIQUID MEMBRANE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. The Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the vapor permeable air barrier liquid membrane as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:

1. Vapor retarder/air barrier applied over sheathing board and cold formed metal framing.

2. Materials and installation to bridge and seal the following air leakage pathways and gaps:

a. Connections of the walls to the roof.
b. Connections of the walls to the foundations.
c. Seismic and expansion joints.
d. Openings and penetrations of window frames, storefront, curtain wall.
e. Door frames.
f. Piping, conduit, duct and similar penetrations.
g. Masonry ties, screws, bolts and similar penetrations.
h. All other air leakage pathways in the building envelope.

1.3 RELATED SECTIONS

A. Unit Masonry - Section 042000.

B. Cold formed metal framing, including sheathing - Section 054000.

1.4 SUBMITTALS

A. Provide evidence to the Architect of licensing and certification under the Air Barrier Association of America's (ABAA's) Quality Assurance Program.

B. Submit shop drawings showing locations and extent of air/vapor barrier and details of all typical conditions, intersections with other envelope systems and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated and how miscellaneous penetrations such as conduits, pipes electric boxes and the like are sealed.

C. Submit manufacturer's product data sheets for each type of membrane, including manufacturer's printed instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.

D. Submit manufacturer's data showing solids content of fluid applied membranes and coverage rates and wet film thickness upon application in order to achieve minimum dry film thickness required by this specification.

E. Submit manufacturer's installation instructions.

F. Submit certification by air/vapor barrier manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

G. Submit certification of compatibility by air/vapor barrier manufacturer, listing all materials on the project that it connects to or that come in contact with it, including sealant as specified in Section 054000 for caulking joints between sheathing panels.

H. Submit samples, 3 by 4 inch minimum size, of each air/vapor barrier material required for Project.

I. Test results of air permeability testing of primary air barrier material (ASTM E 2178-01).

J. Test results of assembly in accordance with ASTM E 2357.

1.5 PERFORMANCE REQUIREMENTS

A. Provide air/vapor barrier constructed to perform as a continuous air/vapor barrier, and as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration. Membrane shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air seal materials at such locations, changes in substrate and perimeter conditions.

B. Provide an air barrier assembly that has been tested in accordance with the Air Barrier Association of America's (ABAA's) approved testing protocol to provide air leakage results not to exceed 0.01 cfm/sf @ 1.57 psf.

C. Connections to Adjacent Materials: Provide connections to adjacent materials at the following locations and show same on shop drawings:

1. Foundation and walls, including penetrations, ties and anchors.

2. Walls, windows, curtain walls, storefronts, louvers or doors.

3. Different wall assemblies, and fixed openings within those assemblies.

4. Wall and roof connections.

5. Floors over unconditioned space.

6. Walls, floor and roof across construction, control and expansion joints.

7. Walls, floors and roof to utility, pipe and duct penetrations.

8. Seismic and expansion joints.

9. All other leakage pathways in the building envelope.

1.6 QUALITY ASSURANCE

A. Installer Qualifications:

1. The air barrier contractor shall be, during the bidding period as well as for the duration of the installation, officially recognized as a Licensed Contractor by the Air Barrier Association of America (ABAA). The contractor shall carry liability insurance and bonding.

2. Each worker who is installing air barriers must be either a Certified Applicator or an installer who is registered with ABAA.

3. Each Lead Certified Applicator can supervise a maximum of five registered installers. The Certified Applicator shall be thoroughly trained and experienced in the installation of air barriers of the types being applied. Lead Certified Applicators shall perform or directly supervise all air/vapor barrier work on the project.

B. Single-Source Responsibility: Obtain air/vapor barrier materials from a single manufacturer regularly engaged in manufacturing the product.

C. Provide products which comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

D. Field-Constructed Mock-Ups: Prior to installation of air/vapor barrier, apply air/vapor barrier as follows to verify details under shop drawing submittals and to demonstrate tie-ins with adjoining construction, and other termination conditions, as well as qualities of materials and execution:

1. Construct typical exterior wall panel, 8 feet long by 8 feet wide (one of CMU and one of sheathed areas, incorporating back-up wall, cladding, window and doorframe and sill, insulation, flashing, building corner condition, and typical penetrations and gaps; illustrating materials interface and seals.

E. Test mock-up in accordance with ASTM E 783 and ASTM E 1105 for air and water infiltration.

F. Manufacturer shall be on-site at least once a week to observe installation and provide written report within 3 days.

G. Manufacturer shall confirm all termination details and compatibility with materials being terminated to.

H. Vertical and Lateral Fire Propagation Test Characteristics: The exterior wall assembly is required to comply with NFPA 285 "Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-bearing Wall Assemblies Containing

Combustible Components." The base wall, stud cavity insulation, wall sheathing, air barrier, continuous wall rigid insulation and exterior cladding are components that are required to be to be evaluated as part of this specific assembly test. The basis of design product listed herein is a component of the design test assembly selected by the Architect.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product, date of manufacture, and directions for storage.

B. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air/vapor barrier manufacturer. Protect stored materials from direct sunlight.

C. Avoid spillage. Immediately notify Owner, Architect if spillage occurs and start clean up procedures.

D. Clean spills and leave area as it was prior to spill.

1.8 WARRANTY

A. System Warranty: Provide the manufacturer’s three (3) year system warranty, including the primary air/vapor barrier and installed accessory sealant and membrane materials which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 MATERIALS

A. Liquid Membrane: Henry Air-Bloc 31 Vapour Permeable Liquid Membrane or Tremco ExoAir 220R/SP or ProSoCo Spray Wrap Cat 5, Sikaguard 530 by Sika or equal by W.R. Grace or approved equal. Trade names used herein are those of the Henry Co.

B. Transition Membrane: Blueskin Breather or ProSoCo Fast Flash.

C. Primer for Blueskin SA: Blueskin Primer.

D. Air Barrier Sealant: Bakor Blueskin Sealant.

E. Thermoplastic Rubber Sealant: Bakor Pro-Seal Sealant or ProSoCo Joint and Seam filler.

F. Substrate Cleaner: Mineral spirits or Xylol.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions where the above grade waterproof membrane is to be installed and correct any conditions detrimental to the proper and timely completion of

the work. Do not proceed with the work until unsatisfactory conditions have been corrected to permit proper installation of the work.

3.2 SURFACE PREPARATION

A. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants.

B. Cracks in masonry and concrete up to 1/4" wide shall be filled with a trowel application of Air-Bloc 31 and allowed to cure overnight prior to application of the liquid membrane to the surface, or alternatively, the cracks may be sealed with a strip of Blueskin membrane applied to the substrate. Cracks wider than 1/4" should be sealed with Blueskin membrane adhered to the substrate lapped a minimum of 3" on both sides of the crack.

C. Surfaces should be tied in with beams, columns, window and door frames, etc. using strips of Blueskin Breather lapped a minimum of 3" on both substrates. Mechanical attachment should be made to all window and door frames, or a properly designed sealant joint provided.

3.3 TRANSITION MEMBRANE

A. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 3" overlap at all ends and side laps.

B. Tie-in to window frames, metal door frames, etc., and at the interface of dissimilar materials as indicated on the Drawings.

C. Promptly roll all laps and membrane with a counter top roller to effect seal.

D. Ensure all preparatory work is complete prior to applying Air-Bloc 31.

3.4 THROUGH-WALL FLASHING MEMBRANE

A. Align and position the leading edge of Blueskin TWF self-adhering through-wall flashing membrane with the front horizontal edge of the foundation walls or shelf angles, partially remove protective film and roll membrane over surface and up vertically.

B. Press firmly into place. Ensure minimum 50mm overlap at all end and side laps.

C. Promptly roll all laps and membrane to effect the seal.

D. Ensure all preparatory work is complete prior to applying Blueskin TWF.

E. Ensure through-wall flashing membrane extends fully to the exterior face of the exterior masonry veneer. Trim off excess as directed by the consultant.

F. Apply through-wall flashing membrane along the base of masonry veneer walls, over windows, doors and all other wall openings. Membrane shall form continuous flashing and shall extend up a minimum of 4-1/2" up the back-up wall.

G. When flashing at window openings, wrap the entire window opening with air barrier flashing membrane.

3.5 LIQUID MEMBRANE APPLICATION

A. Apply Air-Bloc 31 to wall substrates in a continuous coat at manufacturer's recommended rate by spray or trowel to provide a minimum wet film thickness of 0.093".

1. Minimum dry film thickness shall be 0.078".

B. Overlap liquid membrane on to transition membrane at connections a minimum of 1".

C. Trowel Air-Bloc 31 around ties and other projections to ensure a complete seal.

D. Do not leave membrane exposed for any longer than 6 weeks.

E. Penetrations: Seal all penetrations with termination mastic liquid membrane, sealant, flashing or other procedures in accordance with manufacturer's instructions.

3.6 PROTECTING AND CLEANING

A. Protect air/vapor barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

C. Protect air/vapor barrier from exposure to the elements as required by the manufacturer.

D. Remove any masking materials after installation. Clean any stains on materials that would be exposed in the completed work using procedures as recommended by manufacturer.

1. Schedule work to ensure that the air and vapor barrier system is covered as soon as possible after installation. Protect air and vapor barrier system from damage during subsequent operations. If the air and vapor barrier system cannot be permanently covered within 30 days after installation, apply temporary UV protection such as dark plastic sheet or tarpaulins.

3.7 FIELD QUALITY CONTROL

A. Air Barrier Association of America Installer Audits: Cooperate with ABAA's testing agency. Allow access to work areas and staging. Notify ABAA in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted. Arrange and pay for site inspections by ABAA to verify conformance with the material Manufacturer's instructions, the site Quality Assurance Program used by ABAA, and this section of the project specification.

1. Audits and subsequent testing shall be carried out at the following rate:

a. Up to 10,000 ft^2 of air barrier contract requires one (1) audit.
b. 10,001 – 35,000 ft^2 of air barrier contract requires two (2) audits.

c. 35,001 – 75,000 ft^2 of air barrier contract requires three (3) audits.
d. 75,001 - 125,000 ft^2 of air barrier contract requires four (4) audits.
e. 125,001 – 200,000 ft^2 of air barrier contract requires five (5) audits.
f. 200,001 ft^2 and over of air barrier contract requires six (6) audits.

2. Forward written audit reports to the Architect within 10 working days of the inspection and test being performed.

3. If the inspections reveal any defects, promptly remove and replace defective work at no additional cost to the Owner.

B. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.

2. Remove and replace deficient air-barrier components for retesting as specified above.

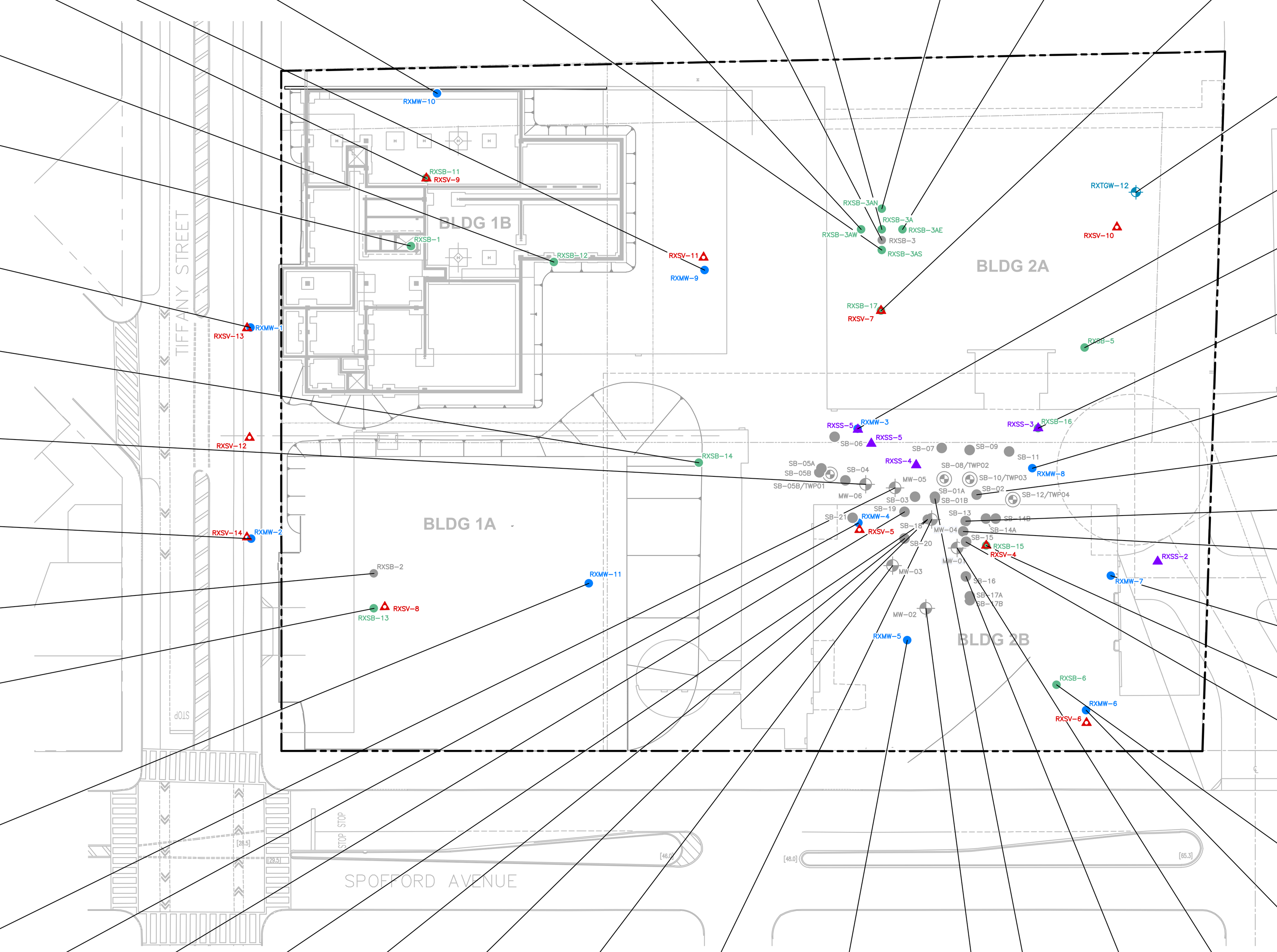
C. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

END OF SECTION

PLATES

1. Soil Sample Exceedances of Soil Cleanup Objectives
2. Groundwater Sample Exceedances
3. Soil Vapor Sample Results
4. Remedial Alternative 1: Track 1 Cleanup
5. Remedial Alternative 2: Track 4 Cleanup
6. Proposed Post-Construction Endpoint Sample Plan

SOIL SAMPLE EXCEEDANCES OF THE SOIL CLEANUP OBJECTIVES



RXMW-9	04/23/2018	04/25/2018
Depth (ft bls)	0 - 2	5 - 7
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	ND
Metals		
Chromium	39.6	51.1
Copper	242	481
Lead	306	163
Nickel	39.8	48.5
Zinc	2,330	1,050
PCBs	ND	ND
Pesticides	ND	ND

RXMW-10	04/23/2018	04/23/2018
Depth (ft bls)	0 - 2	2 - 4
Parameter (mg/kg)		
VOCs	NE	ND
SVOCs	NE	NE
Metals		
Barium	419	489
Chromium	38.1	46.4
Copper	58.9	57.6
Nickel	36.7	41.9
PCBs	ND	ND
Pesticides	ND	ND

RXSB-3AS	05/22/2018	05/22/2018	05/22/2018
Depth (ft bls)	0 - 2	2 - 4	4 - 6
Parameter (mg/kg)			
Metals			
Arsenic	14.7	NE	NE
Copper	60.6	92.1	NE
Lead	64	113	67.5
Zinc	322	708	140

RXSB-3AW	05/22/2018	05/22/2018	05/22/2018
Depth (ft bls)	0 - 2	2 - 4	4 - 6
Parameter (mg/kg)			
Metals			
Arsenic	40.4	NE	NE
Copper	92.7	NE	NE

RXSB-3	04/25/2017	04/26/2017
Depth (ft bls)	0 - 2	6 - 8
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	NE
Metals		
Arsenic	18	NE
Copper	64	NE
Zinc	270	NE
PCBs	ND	ND
Pesticides	NE	NE

RXSB-3A	05/22/2018	05/22/2018	05/22/2018
Depth (ft bls)	0 - 2	2 - 4	4 - 6
Parameter (mg/kg)			
Metals			
Copper	148	NE	NE
Lead	179	NE	NE
Nickel	31.3	NE	NE
Zinc	1,240	NE	NE

RXSB-3AN	05/22/2018	05/22/2018	05/22/2018
Depth (ft bls)	0 - 2	2 - 4	4 - 6
Parameter (mg/kg)			
Metals			
Arsenic	20.3	NE	NE
Chromium	NE	45.8	39.7
Copper	86.3	524	323
Lead	129	604	382
Nickel	NE	70.2	47.6
Zinc	569	4,410	2,330

RXSB-3AE	05/22/2018	05/22/2018	05/22/2018
Depth (ft bls)	0 - 2	2 - 4	4 - 6
Parameter (mg/kg)			
Metals			
Arsenic	36.9	NE	NE
Chromium	35.9	44	NE
Copper	1,170	457	NE
Lead	338	481	NE
Nickel	75.1	64.6	NE
Zinc	3,010	3,840	NE

RXSB-17	05/23/2018	05/23/2018	05/23/2018
Depth (ft bls)	0 - 2	0 - 2	5 - 7
Parameter (mg/kg)		DUP	
VOCs	NE	NE	NE
SVOCs	NE	NE	NE
Metals			
Arsenic	55.7	37.8	NE
Barium	382	NE	NE
Chromium	NE	31.2	35.9
Copper	94.2	80	143
Lead	96.9	88.9	169
Nickel	NE	NE	40.6
Zinc	671	448	1,030
PCBs	ND	ND	ND
Pesticides			
4,4'-DDT	0.0063 J	0.005 J	ND

RXTGW-12	5/24/2018	5/24/2018
Depth (ft bls)	0 - 2	4 - 6
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	ND	ND
Metals	NE	NE
PCBs	ND	ND
Pesticides	ND	ND

RXSB-11	04/23/2018	04/26/2018
Depth (ft bls)	0 - 2	3 - 5
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	ND
Metals		
Copper	NE	59.1
Nickel	NE	37.8
PCBs	ND	ND
Pesticides	ND	ND

RXSB-12	04/23/2018	04/26/2018
Depth (ft bls)	0 - 2	6 - 8
Parameter (mg/kg)		
VOCs	ND	NE
SVOCs	ND	ND
Metals		
Chromium	NE	102
Copper	NE	2,100
Nickel	NE	85.7
Zinc	NE	269
PCBs	ND	ND
Pesticides	ND	ND

RXSB-1	04/24/2017	04/25/2017
Depth (ft bls)	0 - 2	8 - 10
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	ND
Metals	NE	NE
PCBs	ND	ND
Pesticides	NE	ND

RXMW-1	06/14/2018	06/15/2018
Depth (ft bls)	0 - 2	7 - 9
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	NE
Metals		
Arsenic	14.1	NE
Lead	69.9	NE
PCBs	ND	ND
Pesticides	ND	ND

RXSB-14	04/24/2018	04/24/2018
Depth (ft bls)	0 - 2	0 - 2
Parameter (mg/kg)		DUP
VOCs	ND	ND
SVOCs	NE	NE
Metals		
Copper	NE	53.8
Zinc	NE	128
PCBs	ND	ND
Pesticides	ND	ND

MW-06	9/2014
Depth (ft bls)	0.5-2.5
Parameter (mg/kg)	
Total Volatiles	0.027
Naphthalene	0.088

RXMW-2	06/15/2018	06/15/2018
Depth (ft bls)	0 - 2	13 - 15
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	NE
Metals		
Lead	72.5	NE
Mercury	0.34	ND
Hexavalent Chromium	ND	1.1 J
PCBs	ND	ND
Pesticides	ND	ND

RXSB-2	04/24/2017	04/25/2017
Depth (ft bls)	0 - 2	7 - 9
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	ND
Metals	NE	NE
PCBs	NE	ND
Pesticides	NE	NE

RXSB-13	04/24/2018	04/26/2018
Depth (ft bls)	0 - 2	13 - 15
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs		
Benzo(A)Anthracene	1.2	ND
Benzo(A)Pyrene	1.3	ND
Benzo(B)Fluoranthene	1.7	ND
Chrysene	1.3	ND
Indeno(1,2,3-C,D)Pyrene	0.78	ND
Metals		
Barium	630	NE
Chromium	55.7	34.5
Copper	121	NE
Lead	424	NE
Mercury	0.65	NE
Nickel	NE	44.7
Zinc	899	NE
PCBs	ND	ND
Pesticides		
4,4'-DDT	0.0037 J	ND

RXMW-11	04/23/2018	04/27/2018
Depth (ft bls)	0 - 2	11 - 13
Parameter (mg/kg)		
VOCs	ND	NE
SVOCs	NE	NE
Metals		
Chromium	30.1	NE
Nickel	34.7	31
PCBs	ND	ND
Pesticides	ND	ND

MW-05	9/2014
Depth (ft bls)	1-3
Parameter (mg/kg)	
Total Volatiles	4.97
Naphthalene	3.1

RXMW-4	04/24/2018	05/01/2018
Depth (ft bls)	0 - 2	13 - 15
Parameter (mg/kg)		
VOCs	ND	NE
SVOCs	NE	ND
Metals		
Chromium	66.4	35.6
Copper	468	70.4
Lead	486	NE
Nickel	67.2	31.4
Zinc	3,460	188
PCBs	ND	ND
Pesticides	ND	ND

SB-19A	03/27/2009
Depth (ft bls)	19-19.5
Parameter (mg/kg)	
VOCs	
Xylenes (total)	0.54
SVOCs	ND/NE

SB-18A	03/27/2009
Depth (ft bls)	17-17.5
Parameter (mg/kg)	
VOCs	
1,2,4-Trimethylbenzene	5.5
Toluene	0.8
Xylenes (total)	4.8
SVOCs	ND/NE

SB-20A	03/27/2009
Depth (ft bls)	17-17.5
Parameter (mg/kg)	
VOCs	ND/NE
SVOCs	
Benzo[a]anthracene	28
Benzo[a]pyrene	16
Benzo[b]fluoranthene	25
Benzo[k]fluoranthene	9.5
Chrysene	26
Dibenzo[a,h]anthracene	2.3
Indeno[1,2,3-cd]pyrene	6.4

SB-18B	03/27/2009
Depth (ft bls)	18.5-19
Parameter (mg/kg)	
VOCs	
1,2,4-Trimethylbenzene	17
Ethylbenzene	2.1
Toluene	1.1
Xylenes (total)	9.4
SVOCs	
Benzo[a]anthracene	28
Benzo[a]pyrene	14
Benzo[b]fluoranthene	21
Benzo[k]fluoranthene	8.9
Chrysene	23
Dibenzo[a,h]anthracene	2.2
Indeno[1,2,3-cd]pyrene	6
Naphthalene	12

MW-03	9/2014	9/2014
Depth (ft bls)	11-13	16-18
Parameter (mg/kg)		
Total Volatiles	1.15	72.95
Naphthalene	0.24	24

MW-04	9/2014	9/2014
Depth (ft bls)	15-17	17-19
Parameter (mg/kg)		
Total Volatiles	7.93	22.76
Naphthalene	1.20	5.40

RXMW-5	04/26/2018	05/02/2018
Depth (ft bls)	0 - 2	12 - 14
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs		
Indeno(1,2,3-C,D)Pyrene	0.52	ND
Metals		
Chromium	NE	32.9
Copper	93	NE
Lead	170	NE
Nickel	NE	30.1
Zinc	666	NE
PCBs	ND	ND
Pesticides	ND	ND

MW-02	9/2014	9/2014
Depth (ft bls)	13-15	15-17
Parameter (mg/kg)		
Total Volatiles	0.0047	1.20
Naphthalene	0.0021	0.42

SB-01B	03/24/2009
Depth (ft bls)	1.0-1.5
Parameter (mg/kg)	
VOCs	
1,2,4-Trimethylbenzene	6.8
n-Propylbenzene	5.6
Xylenes (total)	0.29
SVOCs	ND/NE

SB-16A	03/26/2009
Depth (ft bls)	15.5-16
Parameter (mg/kg)	
VOCs	
1,2,4-Trimethylbenzene	790
1,3,5-Trimethylbenzene	180
Ethylbenzene	120
Napthalene	390
n-Butylbenzene	60
n-Propylbenzene	110
sec-Butylbenzene	68
Toluene	120
Xylenes (total)	730
SVOCs	
Acenaphthene	37
Naphthalene	120

MW-01	9/2014	9/2014
Depth (ft bls)	11-13	13-15
Parameter (mg/kg)		
Total Volatiles	0.0015	76.30
Naphthalene	0.46	18

RXMW-6	04/25/2018	04/27/2018
Depth (ft bls)	0 - 2	9 - 11
Parameter (mg/kg)		
VOCs	ND	NE
SVOCs	NE	NE
Metals		
Copper	219	NE
Lead	173	NE
Zinc	1,510	NE
PCBs	ND	ND
Pesticides	ND	ND

RXSB-6	04/24/2017	04/25/2017
Depth (ft bls)	0 - 2	8 - 10
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs		
Benzo(A)Anthracene	1.5	ND
Benzo(B)Fluoranthene	1.4	ND
Chrysene	1.3	ND
Indeno(1,2,3-C,D)Pyrene	0.58	ND
Metals		
Copper	190	NE
Lead	159	NE
Zinc	1200	NE
PCBs	NE	ND
Pesticides	NE	ND

RXMW-3	05/25/2018
Depth (ft bls)	1 - 3
Parameter (mg/kg)	
VOCs	NE
SVOCs	NE
Metals	
Barium	379
Chromium	42.4
Copper	60.6
Nickel	30.8
PCBs	ND
Pesticides	ND

RXSB-5	04/25/2017	04/26/2017
Depth (ft bls)	0 - 2	5 - 6
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	ND
Metals		
Zinc	120	NE
PCBs	ND	ND
Pesticides		
4,4'-DDD	ND	0.0618
4,4'-DDE	NE	0.0766
4,4'-DDT	NE	0.513

RXSB-16	05/29/2018	05/29/2018
Depth (ft bls)	1 - 3	9 - 11
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	NE
Metals		
Barium	855	NE
Beryllium	20.2	NE
Chromium	344	133
Copper	4,840	1,170
Lead	4,010	972
Nickel	487	148
Zinc	36,000	9,030
PCBs	ND	ND
Pesticides		
4,4'-DDT	0.0037 J	ND

RXMW-8	05/29/2018	05/29/2018
Depth (ft bls)	1 - 3	9 - 11
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	NE
Metals		
Chromium	71.1	41.3
Copper	549	113
Lead	390	102
Nickel	106	40.8
Zinc	2,920	840
PCBs	ND	ND
Pesticides	ND	ND

SB-02A	03/24/2009
Depth (ft bls)	0.5-1.0
Parameter (mg/kg)	
VOCs	
n-Propylbenzene	8.1
sec-Butylbenzene	11
Xylenes (total)	0.63
SVOCs	ND/NE

SB-13A	03/26/2009
Depth (ft bls)	11.5-12
Parameter (mg/kg)	
VOCs	
1,2,4-Trimethylbenzene	7.1
Xylenes (total)	4.1
SVOCs	ND/NE

RXSB-4	04/24/2017	04/24/2017	04/25/2017
Depth (ft bls)	0 - 2	0 - 2	11 - 13
Parameter (mg/kg)		DUP	
VOCs	NE	NE	NE
SVOCs			
Benzo(A)Anthracene	4	3.6	ND
Benzo(A)Pyrene	3.5	3.3	ND
Benzo(B)Fluoranthene	4.8	4.2	ND
Benzo(K)Fluoranthene	1.5	1.4	ND
Chrysene	3.5	3.2	ND
Dibenz(A,H)Anthracene	0.58	0.54	ND
Indeno(1,2,3-C,D)Pyrene	2.5	2.3	ND
Metals			
Lead	64	NE	NE
Zinc	210	230	NE
PCBs	NE	NE	ND
Pesticides			
4,4'-DDD	NE	0.00457	ND

RXMW-7	06/14/2018	06/15/2018
Depth (ft bls)	0 - 2	12 - 14
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	NE
Metals		
Copper	299	NE
Lead	313	NE
Nickel	43.3	NE
Zinc	2,760	NE
PCBs	ND	ND
Pesticides	ND	ND

RXSB-15	04/26/2018	05/01/2018
Depth (ft bls)	0 - 2	6 - 8
Parameter (mg/kg)		
VOCs	NE	NE
SVOCs	NE	NE
Metals		
Zinc	114	NE
PCBs	ND	ND
Pesticides	ND	ND

SB-15A	03/26/2009
Depth (ft bls)	15-15.5
Parameter (mg/kg)	
VOCs	
1,2,4-Trimethylbenzene	190
1,3,5-Trimethylbenzene	53
Ethylbenzene	26
Napthalene	85
n-Butylbenzene	18
n-Propylbenzene	28
sec-Butylbenzene	18
Toluene	24
Xylenes (total)	151
SVOCs	
Acenaphthene	32
Naphthalene	120

LEGEND

- SITE BOUNDARY
- SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- SOIL BORING LOCATION AND DESIGNATION
- SOIL VAPOR LOCATION AND DESIGNATION
- SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- MW-06 — MONITORING WELL RESAMPLING LOCATION AND DESIGNATION

DATA BOX KEY

SAMPLE LOCATION — SAMPLE DATE

RXSB-3AW	05/22/2018	05/22/2018	05/22/2018
Depth (ft bls)	0 - 2	2 - 4	4 - 6
Parameter (mg/kg)			
Metals			
Arsenic	40.4	NE	NE
Copper	92.7	NE	NE

ANALYTE — RESULTS

Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	NYSDEC Part 375 Protection of Groundwater SCO
VOCs (mg/kg)			
1,2,4-Trimethylbenzene	3.6	52	3.6
1,3,5-Trimethylbenzene	8.4	52	8.4
p-Isopropyltoluene	0	0	10
Ethylbenzene	1	41	1
n-Butylbenzene	12	100	12
n-Propylbenzene	3.9	100	3.9
sec-Butylbenzene	11	100	11
Toluene	0.7	100	0.7
Xylenes (total)	0.26	100	1.6
SVOCs (mg/kg)			
Acenphthene	20	100	98
Benzo(A)Anthracene	1	1	1
Benzo(A)Pyrene	1	1	22
Benzo(B)Fluoranthene	1	1	1.7
Benzo(K)Fluoranthene	0.8	3.9	1.7
Chrysene	1	3.9	1
Dibenz(A,H)Anthracene	0.33	0.33	1000
Indeno(1,2,3-C,D)Pyrene	0.5	0.5	8.2
Napthalene	12	100	12
Metals (mg/kg)			
Arsenic	13	16	16
Barium	350	400	820
Beryllium	7.2	72	47
Chromium	30	180	--
Copper	50	270	1720
Lead	63	400	450
Nickel	30	310	130
Zinc	109	10000	2480
Pesticides (mg/kg)			
4,4'-DDD	0.0033	13	14
4,4'-DDE	0.0033	8.9	17

mg/kg – MILLIGRAMS PER KILOGRAM
SCO – SOIL CLEANUP OBJECTIVE
DUP – DUPLICATE SAMPLE
VOCs – VOLATILE ORGANIC COMPOUNDS
SVOCs – SEMIVOLATILE ORGANIC COMPOUNDS
NE – NO EXCEEDANCE
ND – NO DETECTION
J – ESTIMATED VALUE
FT BLS – FEET BELOW LAND SURFACE
BOLD – DATA INDICATES PARAMETER WAS DETECTED ABOVE NYSDEC PART 375 UNRESTRICTED USE SCO
SHADED – DATA INDICATED PARAMETER WAS DETECTED ABOVE NYSDEC PART 375 RESTRICTED RESIDENTIAL SCO
RED – DATA INDICATED PARAMETER WAS DETECTED ABOVE NYSDEC PART 375 PROTECTION OF GROUNDWATER SCO

NOTES

1. 2009 SOIL DATA SOURCED FROM LOUIS BERGER AND ASSOCIATES, PCs REMEDIAL INVESTIGATION REPORT DATED MAY 15, 2009.
2. 2014 SOIL DATA SOURCED FROM URS CORPORATION'S GROUNDWATER MONITORING AND REMEDIATION REPORT FOR THE FOURTH QUARTER 2017, DATED JANUARY 25, 2017.

40' 0 40'

Title: SOIL SAMPLE EXCEEDANCES OF THE SOIL CLEANUP OBJECTIVES

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For: THE PENINSULA JV, LLC

ROUX

Compiled by: J.W.	Date: 5SEPT18	PLATE
Prepared by: G.M.	Scale: AS SHOWN	1
Project Mgr: D.H.	Project: 2611.0002Y000	
File: 2611.0002Y121.04.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.04.DWG

RXMW-10	6/22/2018
Parameter (µg/L)	
VOCs	ND
SVOCs	ND
Metals	
Iron (total)	**1,560**
Iron (dissolved)	**850**
Magnesium (total)	**651**
Magnesium (dissolved)	**632**
Sodium (total)	**25,600**
Sodium (dissolved)	**22,000**
PCBs	ND
Pesticides	ND

RXMW-9	6/22/2018
Parameter (µg/L)	
VOCs	ND
SVOCs	ND
Metals	
Iron (total)	**14,600**
Iron (dissolved)	NE
PCBs	ND
Pesticides	ND

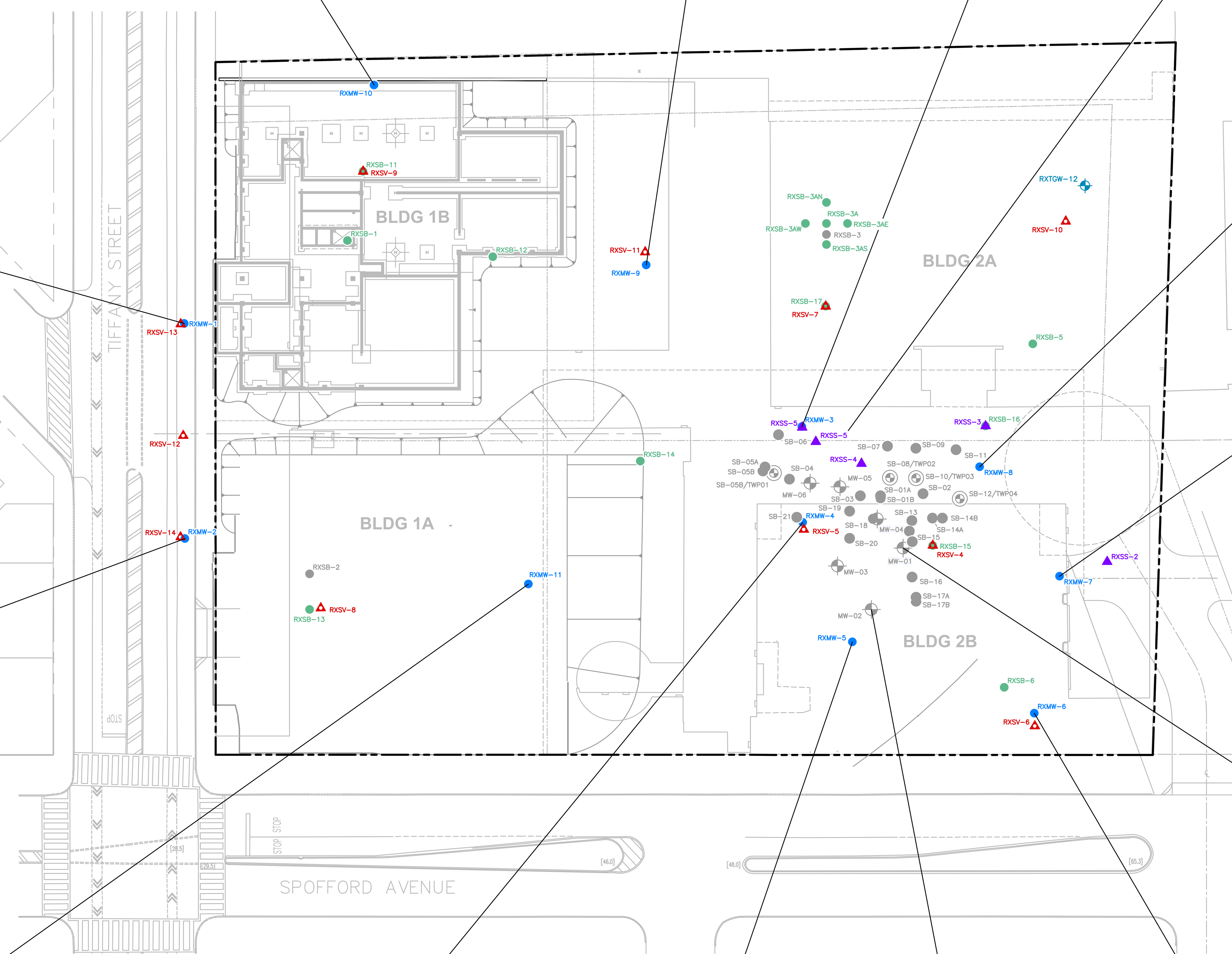
RXMW-3	06/22/2018
Parameter (µg/L)	
VOCs	NE
SVOCs	ND
Metals	
Iron (total)	**2,520**
Iron (dissolved)	**960**
Magnesium (total)	**37,300**
Magnesium (dissolved)	**35,900**
Manganese (total)	**506**
Manganese (dissolved)	**480**
Sodium (total)	**27,300**
Sodium (dissolved)	**26,100**
PCBs	ND
Pesticides	ND

MW-6	06/22/2018
Parameter (µg/L)	
VOCs	NE
SVOCs	ND
Metals	
Iron (total)	**4,270**
Iron (dissolved)	**1,310**
Magnesium (total)	**59,800**
Magnesium (dissolved)	**56,600**
Manganese (total)	**495**
Manganese (dissolved)	**464**
Sodium (total)	**251,000**
Sodium (dissolved)	**151,000**
PCBs	ND
Pesticides	ND

RXMW-8	6/22/2018
Parameter (µg/L)	
VOCs	ND
SVOCs	ND
Metals	
Manganese (total)	**49,600**
Manganese (dissolved)	**47,100**
Sodium (total)	**40,200**
Sodium (dissolved)	**37,700**
PCBs	ND
Pesticides	ND

RXMW-1	06/22/2018
Parameter (µg/L)	
VOCs	NE
Chloroform	**7.3**
SVOCs	ND
Metals	
Iron (total)	**14,800**
Iron (dissolved)	NE
Lead (total)	**26**
Lead (dissolved)	NE
Sodium (total)	**21,100**
Sodium (dissolved)	**23,200**
PCBs	ND
Pesticides	ND

RXMW-7	6/21/2018
Parameter (µg/L)	
VOCs	NE
SVOCs	NE
Metals	
Iron (total)	**766**
Iron (dissolved)	NE
Sodium (total)	**44,800**
Sodium (dissolved)	**42,200**
PCBs	ND
Pesticides	ND



RXMW-2	06/22/2018
Parameter (µg/L)	
VOCs	NE
SVOCs	ND
Metals	
Iron (total)	**973**
Iron (dissolved)	NE
Manganese (total)	**606**
Manganese (dissolved)	**525**
Sodium (total)	**70,900**
Sodium (dissolved)	**68,500**
PCBs	ND
Pesticides	ND

MW-1	06/21/2018
Parameter (µg/L)	
VOCs	
Ethylbenzene	**10**
SVOCs	NE
Metals	
Iron (total)	**2,820**
Iron (dissolved)	**1,770**
Manganese (total)	**526**
Manganese (dissolved)	**486**
PCBs	ND
Pesticides	ND

RXMW-11	6/22/2018
Parameter (µg/L)	
VOCs	ND
SVOCs	ND
Metals	
Iron (total)	**2,250**
Iron (dissolved)	**1,060**
Magnesium (total)	**681**
Magnesium (dissolved)	**616**
Sodium (total)	**34,700**
Sodium (dissolved)	**32,400**
PCBs	ND
Pesticides	ND

RXMW-4	6/21/2018	6/21/2018
Parameter (µg/L)		DUP
VOCs	ND	NE
SVOCs	NE	ND
Metals		
Antimony (total)	**3.2**	ND
Antimony (dissolved)	ND	ND
Iron (total)	**5,190**	**12,100**
Iron (dissolved)	NE	NE
Magnesium (total)	**37,800**	**37,200**
Magnesium (dissolved)	NE	NE
Manganese (total)	**655**	**653**
Manganese (dissolved)	**548**	**543**
Sodium (total)	**132,000**	**123,000**
Sodium (dissolved)	**128,000**	**129,000**
PCBs	ND	ND
Pesticides	ND	ND

RXMW-5	6/21/2018
Parameter (µg/L)	
VOCs	NE
SVOCs	ND
Metals	
Magnesium (total)	**61,800**
Magnesium (dissolved)	**54,800**
Sodium (total)	**245,000**
Sodium (dissolved)	**206,000**
PCBs	ND
Pesticides	ND

MW-2	06/21/2018
Parameter (µg/L)	
VOCs	NE
Ethylbenzene	**6.8**
Isopropylbenzene	**6.1**
SVOCs	NE
Metals	
Iron (total)	**2,330**
Iron (dissolved)	**353**
Manganese (total)	**533**
Manganese (dissolved)	**428**
Sodium (total)	**22,900**
Sodium (dissolved)	NE
PCBs	ND
Pesticides	ND

RXMW-6	6/21/2018
Parameter (µg/L)	
VOCs	
Tert-Butyl Methyl Ether	**67**
SVOCs	ND
Metals	
Iron (total)	**1,190**
Iron (dissolved)	NE
Magnesium (total)	**46,100**
Magnesium (dissolved)	NE
Manganese (total)	**500**
Manganese (dissolved)	**482**
Sodium (total)	**48,800**
Sodium (dissolved)	**50,500**
PCBs	ND
Pesticides	ND

LEGEND

- SITE BOUNDARY
- RXMW-1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW-11 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB-15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV-4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS-2 — SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- MW-06 — MONITORING WELL RESAMPLING LOCATION AND DESIGNATION

DATA BOX KEY

SAMPLE LOCATION — SAMPLE DATE — ANALYTE — RESULTS

RXMW-9	6/22/2018
Parameter (µg/L)	
VOCs	ND
SVOCs	ND
Metals	
Iron (total)	14,600
Iron (dissolved)	NE
PCBs	ND
Pesticides	ND

Parameter	NYSDEC AWQSGVs
VOCs (µg/L)	
Chloroform	7
Ethylbenzene	5
Isopropylbenzene	5
Tert-Butyl Methyl Ether	10
Metals (µg/L)	
Antimony	3
Iron	300
Lead	25
Magnesium	35,000
Manganese	300
Sodium	20,000

µg/L – MICROGRAMS PER LITER

NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AWQSGV – AMBIENT GROUNDWATER QUALITY STANDARD AND GUIDANCE VALUE

DUP – DUPLICATE SAMPLE

VOCs – VOLATILE ORGANIC COMPOUNDS

NE – NO EXCEEDANCE

ND – NO DETECTION

NS – NOT SAMPLED (MEASURABLE PRODUCT DETECTED IN WELL)

BOLD – DATA INDICATES PARAMETER WAS DETECTED ABOVE NYSDEC AWQSGV

40' 0 40'

Title:

GROUNDWATER RESULTS

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: J.W.	Date: 5SEPT18	PLATE
Prepared by: G.M.	Scale: AS SHOWN	2
Project Mgr: J.W.	Project: 2611.0002Y000	
File: 2611.0002Y121.04.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.04.DWG

RXSV-13 (7') Time 12:35	6/22/2018
VOCs (µg/m³)	
Dichlorodifluoromethane	2.5 J
Chloromethane	1.2 J
n-Butane	23
Trichlorofluoromethane	6.4
Freon TF	0.75 J
Acetone	23 J
Carbon disulfide	19
Methylene Chloride	1.9 J
tert-Butyl alcohol	13 J
n-Hexane	4.8
Methyl Ethyl Ketone	1.9 J
Chloroform	16
Cyclohexane	2.6
Carbon tetrachloride	0.39 J
Benzene	1.5
n-Heptane	8.4
Trichloroethene	1.2
methyl isobutyl ketone	4.3
Toluene	9.2
Tetrachloroethene	5.1
Ethylbenzene	2.2
m,p-Xylene	5.5
Xylene, o-	1.8
Xylene (total)	7.4
Styrene	1.1 J
1,2,4-Trimethylbenzene	0.9 J

RXSV-9 (4') Time 10:35	5/23/2018
VOCs (µg/m³)	
n-Butane	8.5 J
1,1-Dichloroethene	1.6
Acetone	630
Carbon disulfide	13 J
tert-Butyl alcohol	64 J
Methyl Ethyl Ketone	110
Cyclohexane	2.3 J
Benzene	6 J
Toluene	30
Tetrachloroethene	6 J

RXSV-11 (5.5') Time 10:46	5/23/2018
VOCs (µg/m³)	
Acetone	410
Carbon disulfide	19
Methyl Ethyl Ketone	54
Benzene	5.5 J
Toluene	22
Tetrachloroethene	8.9 J

RXSS-5 Time 11:39	06/04/2018
VOCs (µg/m³)	
Acetone	64 J
tert-Butyl alcohol	98 J
Methyl Ethyl Ketone	6.4 J
Cyclohexane	3.4 J
Toluene	3.8 J

RXSV-7 (6') Time 11:55	06/04/2018
VOCs (µg/m³)	
Carbon disulfide	4.9 J

RXSV-10 (4') Time 12:18	06/04/2018
VOCs (µg/m³)	
n-Butane	40
Acetone	220
Carbon disulfide	20
tert-Butyl alcohol	45 J
Cyclohexane	8.9
2,2,4-Trimethylpentane	11
Toluene	2.9 J
Tetrachloroethene	5.3 J

RXSS-4 Time 11:40	06/04/2018
VOCs (µg/m³)	
n-Butane	8500
n-Hexane	2500
Cyclohexane	7200
2,2,4-Trimethylpentane	3600
n-Heptane	520
Trichloroethene	25

RXSS-3 Time 11:51	06/04/2018
VOCs (µg/m³)	
n-Butane	9.5 J
Cyclohexane	8.6
2,2,4-Trimethylpentane	5.1 J
Trichloroethene	3.4
Tetrachloroethene	9.3 J

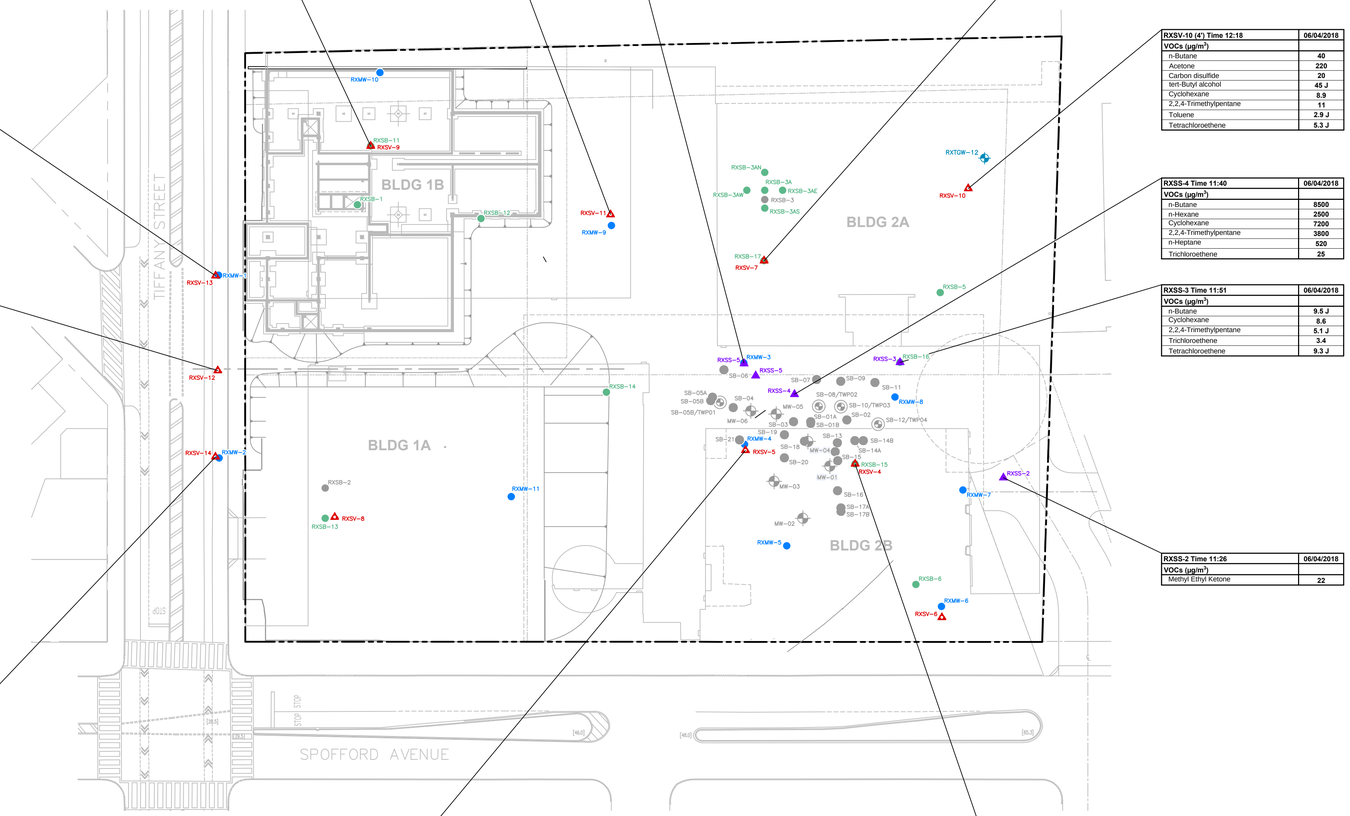
RXSV-12 (7') Time 12:40	6/22/2018
VOCs (µg/m³)	
n-Butane	27
Trichlorofluoromethane	33
Freon TF	1.1 J
Carbon disulfide	200
Methylene Chloride	6.4
Methyl Ethyl Ketone	2.3 J
Chloroform	150
Cyclohexane	3.5
Carbon tetrachloride	0.65 J
2,2,4-Trimethylpentane	6.6
Benzene	1.5 J
n-Heptane	1.8 J
Trichloroethene	1.7
Bromodichloromethane	3.3 J
Toluene	17
Tetrachloroethene	46
Ethylbenzene	57
m,p-Xylene	250
Xylene, o-	93
Xylene (total)	340
Cumene	2.8 J
n-Propylbenzene	1.1 J
4-Ethyltoluene	1.2 J
1,3,5-Trimethylbenzene	1.6 J
1,2,4-Trimethylbenzene	3.3
1,4-Dichlorobenzene	1.5 J

RXSS-2 Time 11:26	06/04/2018
VOCs (µg/m³)	
Methyl Ethyl Ketone	22

RXSV-14 (12') Time 12:30	6/22/2018
VOCs (µg/m³)	
n-Butane	3300
1,3-Butadiene	64
Carbon disulfide	78 J
n-Hexane	310
Chloroform	280
n-Heptane	77
Toluene	150
Tetrachloroethene	13 J
m,p-Xylene	32 J

RXSV-5 (14') Time 12:56	06/04/2018
VOCs (µg/m³)	
n-Butane	31
Acetone	1400
Carbon disulfide	13 J
Methyl Ethyl Ketone	31
Chloroform	7.1 J
Cyclohexane	11 J
Tetrachloroethene	9.7 J

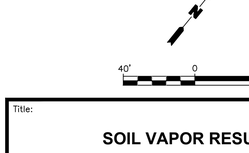
RXSV-4 (7') Time 11:17	06/04/2018
VOCs (µg/m³)	
n-Butane	40
Carbon disulfide	8.2 J
n-Hexane	6.3 J
Tetrachloroethene	4.1 J



LEGEND

- SITE BOUNDARY
- RXMW–1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW–11 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB–15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV–4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS–2 — SUB–SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB–06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB–08/ TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW–03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB–3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS–1 RXSV–2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION

DATA BOX KEY



µg/m³ – MICROGRAMS PER CUBIC METER

J – ESTIMATED VALUE

NS – NOT SAMPLED (WATER DETECTED IN SAMPLE TUBING)

BOLD – DATA INDICATES PARAMETER WAS DETECTED

40' 0 40'

Title:

SOIL VAPOR RESULTS

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

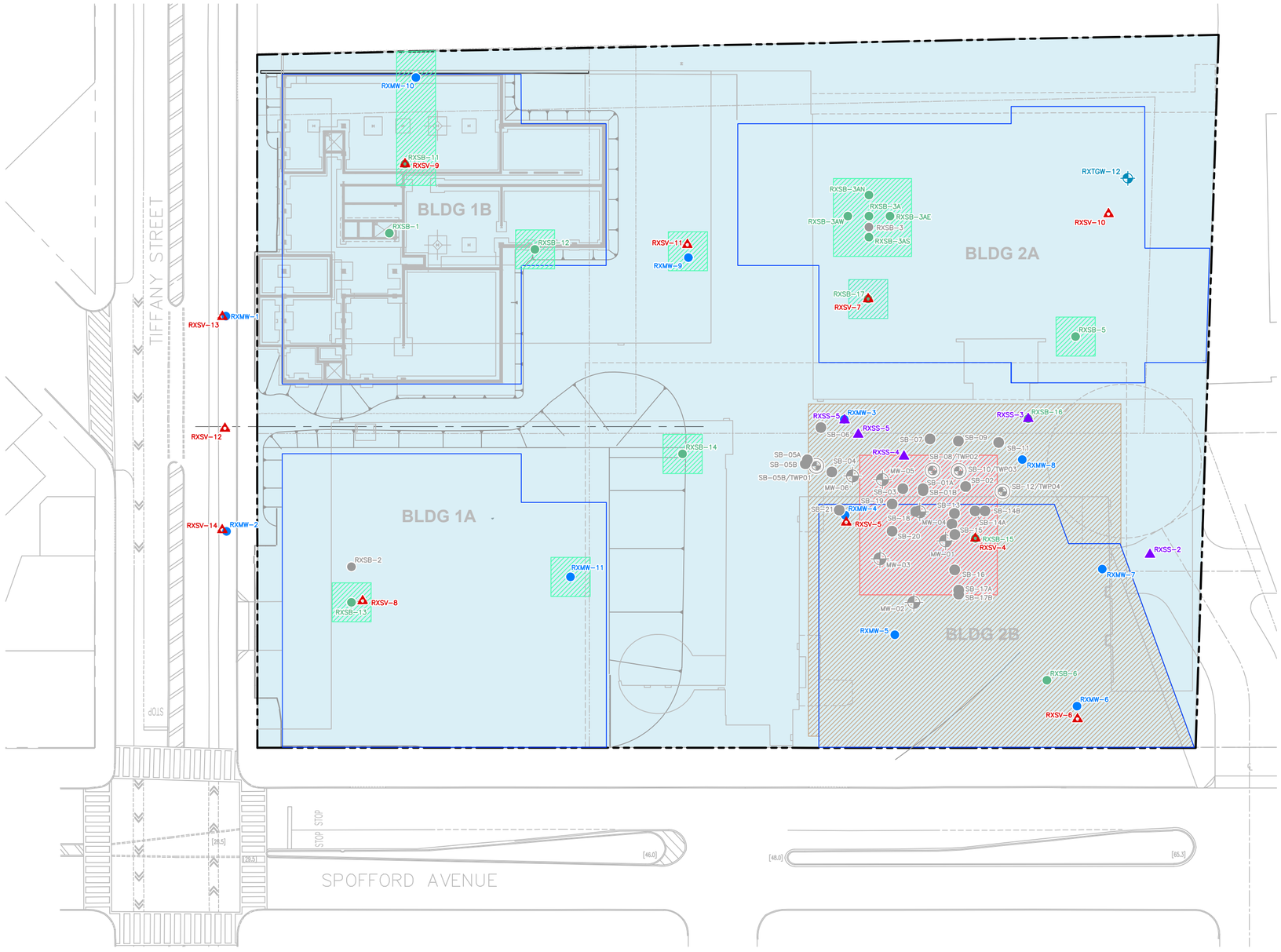
Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: J.W.	Date: 5SEPT18	PLATE
Prepared by: G.M.	Scale: AS SHOWN	3
Project Mgr: J.W.	Project: 2611.0002Y000	
File: 2611.0002Y121.04.DWG		

V:\CAD\PROJECTS\2611\Y\0002Y\121\2611.0002Y121.04.DWG



LEGEND

- SITE BOUNDARY
- LOCATION OF PROPOSED BUILDING
- RXMW-1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW-12 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB-15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV-4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS-2 — SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- MW-06 — MONITORING WELL RESAMPLING LOCATION AND DESIGNATION
- PROPOSED EXCAVATION AREA BASED ON UST PETROLEUM SOURCE AREA (DEPTH TO BEDROCK)
- PROPOSED EXCAVATION AREA BASED ON UNRESTRICTED USE SOIL CLEANUP OBJECTIVES EXCEEDANCES (LIMITS AND DEPTH TO BE DELINEATED DURING PRE-EXCAVATION SAMPLING)
- PROPOSED EXCAVATION AREA BASED ON UNRESTRICTED USE SOIL CLEANUP OBJECTIVES EXCEEDANCES (DEPTH TO 10 FEET OR BEDROCK)
- EXCAVATION OF 2 FEET OF SOIL ACROSS ENTIRE SITE

NOTES

1. AS PART OF TRACK 1 REMEDIAL ACTIVITIES, 2 FEET OF SOIL WILL BE REMOVED ACROSS THE SITE AND TRANSPORTED OFFSITE FOR DISPOSAL.
2. SUPPORT OF EXCAVATION (SOE) IS SHOWN FOR PROPOSED BUILDINGS 1A AND 1B. PROPOSED BUILDINGS 2A AND 2B ARE IN THE PRELIMINARY DESIGN PHASE, THEREFORE, SOE INFORMATION IS NOT YET AVAILABLE.

40' 0 40'

Title:

REMEDIAL ALTERNATIVE 1: TRACK 1 CLEANUP

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

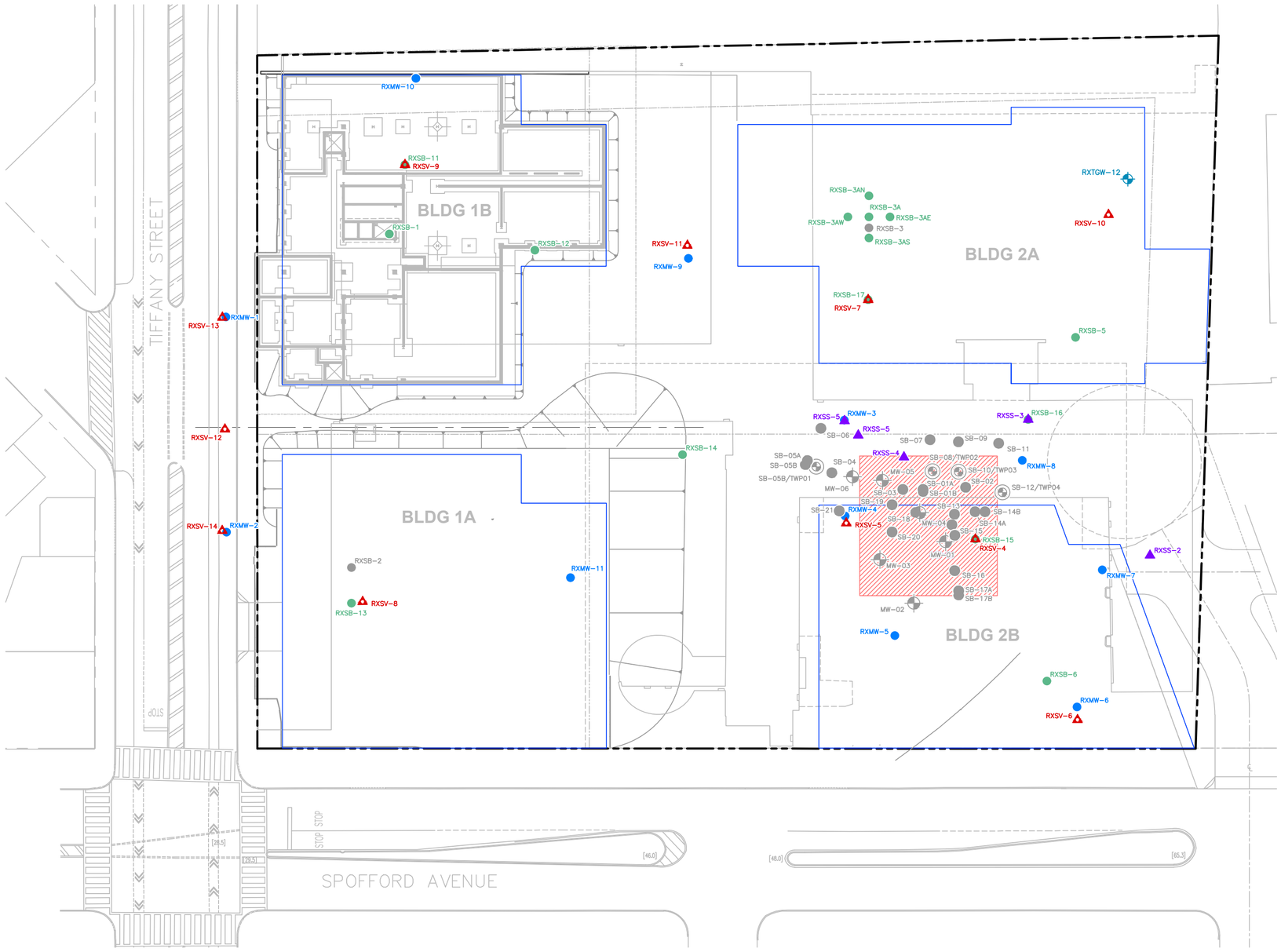
Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: D.H.	Date: 5SEPT18	PLATE 4
Prepared by: G.M.	Scale: AS SHOWN	
Project Mgr: D.H.	Project: 2611.0002Y000	
File: 2611.0002Y121.04.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.04.DWG



LEGEND

- SITE BOUNDARY
- LOCATION OF PROPOSED BUILDING
- RXMW-1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW-12 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB-15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV-4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS-2 — SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 / RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- MW-06 — MONITORING WELL RESAMPLING LOCATION AND DESIGNATION
- PROPOSED EXCAVATION AREA BASED ON UST PETROLEUM SOURCE AREA (DEPTH TO BEDROCK)

NOTES

1. SUPPORT OF EXCAVATION (SOE) IS SHOWN FOR PROPOSED BUILDINGS 1A AND 1B. PROPOSED BUILDINGS 2A AND 2B ARE IN THE PRELIMINARY DESIGN PHASE, THEREFORE, SOE INFORMATION IS NOT YET AVAILABLE.

40' 0 40'

Title:

REMEDIAL ALTERNATIVE 2: TRACK 4 CLEANUP

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For:

THE PENINSULA JV, LLC

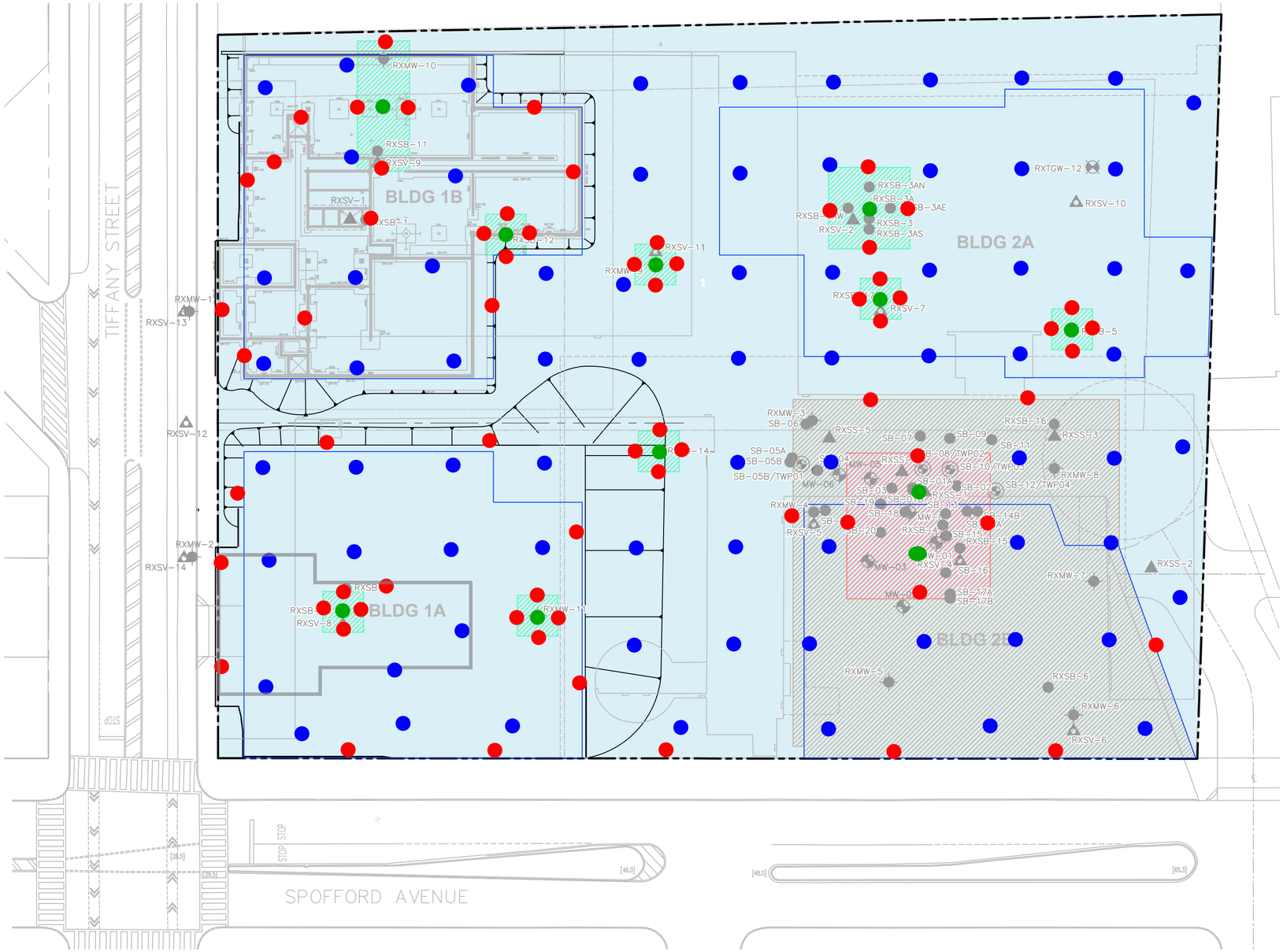
ROUX

Compiled by: D.H.	Date: 5SEPT18	PLATE
Prepared by: G.M.	Scale: AS SHOWN	5
Project Mgr: D.H.	Project: 2611.0002Y000	
File: 2611.0002Y121.04.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.04.DWG

1 / 2000 ft2

67 SIDEWALL SAMPLES
85 ENDPOINT SAMPLES



LEGEND

- SITE BOUNDARY
- LOCATION OF PROPOSED BUILDING
- RXMW-1 — SOIL BORING AND GROUNDWATER WELL LOCATION AND DESIGNATION
- RXTGW-11 — SOIL BORING AND TEMPORARY GROUNDWATER WELL LOCATION (OVERBURDEN)
- RXSB-15 — SOIL BORING LOCATION AND DESIGNATION
- RXSV-4 — SOIL VAPOR LOCATION AND DESIGNATION
- RXSS-2 — SUB-SLAB SOIL VAPOR LOCATION AND DESIGNATION
- SB-06 — SOIL BORING LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- SB-08/TWP02 — COLOCATED SOIL BORING AND TEMPORARY WELL LOCATION AND DESIGNATION FROM LOUIS BERGER AND ASSOCIATES, 2009 INVESTIGATION
- MW-03 — MONITORING WELL LOCATION AND DESIGNATION INSTALLED BY URS, 2014
- RXSB-3 — APPROXIMATE SOIL BORING LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- RXSS-1 / RXSV-2 — APPROXIMATE SUB SLAB/SOIL VAPOR POINT LOCATION AND DESIGNATION FROM ROUX ASSOCIATES 2017 INVESTIGATION
- MW-06 — MONITORING WELL RESAMPLING LOCATION AND DESIGNATION
- PROPOSED EXCAVATION AREA BASED ON UST PETROLEUM SOURCE AREA (DEPTH TO BEDROCK)
- PROPOSED EXCAVATION AREA BASED ON UNRESTRICTED USE SOIL CLEANUP OBJECTIVES EXCEEDANCES (LIMITS AND DEPTH TO BE DELINEATED DURING PRE-EXCAVATION SAMPLING)
- PROPOSED EXCAVATION AREA BASED ON UNRESTRICTED USE SOIL CLEANUP OBJECTIVES EXCEEDANCES (DEPTH TO APPROXIMATELY 10 FEET OR BEDROCK)
- EXCAVATION OF 2 FEET OF SOIL ACROSS ENTIRE SITE
- APPROXIMATE SOIL ENDPOINT SAMPLE LOCATION
- APPROXIMATE SOIL ENDPOINT SAMPLE LOCATION (ENDPOINT SAMPLE WILL BE COLLECTED IF EXCAVATION IS NOT TO BEDROCK)
- APPROXIMATE SOIL SIDEWALL SAMPLE LOCATION

NOTES

1. AS PART OF TRACK 1 REMEDIAL ACTIVITIES, 2 FEET OF SOIL WILL BE REMOVED ACROSS THE SITE AND TRANSPORTED OFFSITE FOR DISPOSAL.
2. SUPPORT OF EXCAVATION (SOE) IS SHOWN FOR PROPOSED BUILDINGS 1A AND 1B. PROPOSED BUILDINGS 2A AND 2B ARE IN THE PRELIMINARY DESIGN PHASE, THEREFORE, SOE INFORMATION IS NOT YET AVAILABLE.
3. SOIL ENDPOINT SAMPLES WILL NOT BE COLLECTED AT LOCATIONS EXCAVATED TO BEDROCK.

40' 0 40'

Title:

POST-CONSTRUCTION ENDPOINT SAMPLE PLAN

REMEDIAL ACTION WORK PLAN
1221 SPOFFORD AVENUE
BRONX, NEW YORK

Prepared For:

THE PENINSULA JV, LLC

ROUX

Compiled by: D.H.	Date: 5DEC18	PLATE 6
Prepared by: J.W.	Scale: AS SHOWN	
Project Mgr: D.H.	Project: 2611.0002Y000	
File: 2611.0002Y121.01.DWG		

V:\CAD\PROJECTS\2611Y\0002Y\121\2611.0002Y121.01.DWG