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# OFF-SITE SITE MANAGEMENT PLAN

for

**27-01 JACKSON AVENUE  
Block 432, Lot 21  
Long Island City, New York  
NYSDEC Order on Consent No. S241209**

*Prepared For:*

**2701 JACKSON LLC  
2701 Jackson Property Owner LLC  
425 Northern Boulevard, Suite #6  
Great Neck, NY 11021**

*Prepared By:*

**Langan Engineering, Environmental, Surveying,  
Landscape Architecture and Geology, D.P.C.  
21 Penn Plaza  
360 West 31<sup>st</sup> Street, 8<sup>th</sup> Floor  
New York, New York 10001**

## Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

**LANGAN**

**December 2022  
Langan Project No. 170472002**

### CERTIFICATION STATEMENT

I, Jason J. Hayes, certify that I am currently a registered professional engineer licensed by the State of New York as defined in 6 New York Codes, Rules and Regulations (NYCRR) Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).

  
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P.E.  
12/8/2022 \_\_\_\_\_  
DATE

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## List of Acronyms

BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CO	Order on Consent
COC	Certificate of Completion
CP	Commissioner Policy
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
IC	Institutional Control
LNAPL	Light Non-Aqueous Phase Liquid
MTBE	Methyl Tertiary-Butyl Ether
NYCDOH	New York City Department of Health
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
PBS	Petroleum Bulk Storage
PCB	Polychlorinated Biphenyl
P.E. or PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
PG	Protection of Groundwater
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RIWP	Remedial Investigation Work Plan
RI	Remedial Investigation
RIR	Remedial Investigation Report

RRU	Restricted Use Restricted-Residential
RSO	Remedial System Optimization
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SIR	Site Investigation Report
SMP	Site Management Plan
SVOC	Semivolatile Organic Compound
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOGS	Technical and Operational Guidance Series
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UU	Unrestricted Use
VOC	Volatile Organic Compound

## EXECUTIVE SUMMARY

This Off-Site Site Management Plan (OSMP) was prepared for the off-site areas within the public right-of-way and sidewalks adjacent to the 27-01 Jackson Avenue site located in the Long Island City neighborhood of Queens, New York, and subject to the Order on Consent and Administrative Settlement (CO), Index No. S241209-08-09, dated April 20, 2022. The 27-01 Jackson Avenue site (BCP site) is identified as Queens Borough Block 432 and Lot 21. The BCP site was remediated pursuant to the September 17, 2018 Brownfield Cleanup Agreement (BCA), Index No. C241209-08-09, between the New York State Department of Environmental Conservation (NYSDEC) and 2701 Jackson Avenue LLC (the Participant) for New York State BCP Site No. C241209. The following amendments were made to the BCA:

- On July 27, 2021, the BCA was amended to change the name of the existing Participant from 2701 Jackson Avenue LLC to 2701 Jackson LLC and to add a new Participant, 2701 Property Owner LLC. This amendment also reflected a transfer of title to the new site owner, 2701 Property Owner LLC.
- On September 3, 2021, the BCA was again amended to submit an affordable housing Restrictive Declaration, dated June 30, 2020, executed by 2701 Property Owner LLC for the benefit of the City of New York acting by and through its Department of Housing Preservation (NYCHPD), for the purposes of acquiring a tangible property tax credit eligibility determination for the BCP site.

The BCP site was remediated to meet Track 1 Unrestricted Use (UU) cleanup objectives and is not subject to any future institutional controls (IC) or engineering controls (EC). Only the off-site sidewalk areas that adjoin the BCP site to the southeast and southwest are subject to the CO, Index No. S241209-08-09. The intent of the CO is to monitor off-site groundwater conditions following off-site groundwater treatment and on-site dewatering. The off-site remedial action objective (RAO) will be achieved when groundwater meets the Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) or continued sampling demonstrates a bulk reduction in contaminants of concern to asymptotic levels in off-site groundwater. The off-site, south- and west-adjointing sidewalks of the BCP site will be hereinafter referred to as the "CO site."

The following provides a brief summary of the controls implemented for the CO site as well as the inspections, maintenance and reporting activities required by this OSMP:



<b>Site Identification:</b>	Off-site areas subject to the CO (Index No. S241209-08-09), adjacent to 27-01 Jackson Avenue, Long Island City, New York (BCP Site No. C241209)
<b>Institutional Controls (IC):</b>	1. Environmental monitoring (i.e., groundwater sampling) must be performed as defined in this OSMP.
	2. The use of groundwater underlying the CO site is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or New York City Department of Health (NYCDOH) to render it safe for use as drinking water or for industrial purposes, and the Participant must first notify and obtain written approval to do so from the NYSDOH or NYCDOH.
	3. Data and information pertinent to the CO site management must be reported at a frequency and in a manner defined in this OSMP.
	4. Groundwater monitoring wells must be protected and replaced as necessary to ensure proper functioning in the manner specified in this OSMP.
	5. Groundwater monitoring may not be discontinued without an amendment or extinguishment of the CO. The CO may be extinguished only by release by the Commissioner of NYSDEC, or the Commissioner's designee.
	6. Compliance with the CO by the Participant and the Participant's successors and assigns and adherence to all elements of this OSMP is required.
	7. All future activities that will disturb remaining contaminated material must be conducted in accordance with this OSMP.
	8. Monitoring to assess the performance and effectiveness of the remedy must be conducted in accordance with this OSMP.

	9. Participant must provide all persons who acquire any interest in the CO site a complete copy of the NYSDEC-approved OSMP for the CO site and all NYSDEC-approved amendments to the OSMP.
<b>Engineering Control:</b>	Groundwater Monitoring
<b>Inspections:</b>	<b>Frequency:</b>
Groundwater Monitoring Wells (MW-1, MW-2, MW-3, MW-4)	Wells will be monitored quarterly for two years. If warranted by results, a request to decrease monitoring frequency or to discontinue monitoring will be submitted to NYSDEC.
<b>Reporting:</b>	<b>Reporting:</b>
Groundwater Sampling Results	Quarterly reporting for two years, after which reporting frequency will be reassessed
Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the subsequent sections of this OSMP.

## **1.0 INTRODUCTION**

### **1.1 General**

This Off-Site Site Management Plan (OSMP) was prepared for the off-site areas within the public right-of-way and sidewalks adjacent to the 27-01 Jackson Avenue site located in the Long Island City neighborhood of Queens, New York, and subject to the Order on Consent and Administrative Settlement (CO), Index No. S241209-08-09, dated April 20, 2022. The 27-01 Jackson site (BCP site) is identified as Queens Borough Block 432 and Lot 21. The BCP site was remediated pursuant to the September 17, 2018 Brownfield Cleanup Agreement (BCA), Index No. C241209-08-09, between the New York State Department of Environmental Conservation (NYSDEC) and 2701 Jackson Avenue LLC (the Participant) for New York State BCP Site No. C241209. The following two amendments were made to the BCA:

- On July 27, 2021, the BCA was amended to change the name of the existing Participant from 2701 Jackson Avenue LLC to 2701 Jackson LLC and to add a new Participant, 2701 Property Owner LLC. This amendment also reflected a transfer of title to the new site owner, 2701 Property Owner LLC.
- On September 3, 2021, the BCA was again amended to submit an affordable housing Restrictive Declaration, dated June 30, 2020, executed by 2701 Property Owner LLC for the benefit of the City of New York acting by and through its Department of Housing Preservation (NYCHPD), for the purposes of acquiring a tangible property tax credit eligibility determination for the BCP site.

The BCP site was remediated to meet Track 1 Unrestricted Use (UU) cleanup objectives and is not subject to any future institutional or engineering controls. Only the off-site sidewalk areas that adjoin the BCP site to the southeast and southwest are subject to the CO, Index No. S241209-08-09. The intent of the CO is to monitor off-site conditions in groundwater following off-site groundwater treatment and on-site dewatering. The off-site remedial action objective (RAO) will be achieved when groundwater meets the Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) or continued sampling demonstrates a bulk reduction in contaminants of concern to asymptotic levels in off-site groundwater. The off-site, south- and west-adjointing sidewalks of the BCP Site will be hereinafter referred to as the "CO site." The CO site location map and site layout plan are provided as Figures 1 and 2.

Following implementation of the Track 1 remedy for BCP Site No. C241209, residual petroleum-impacted groundwater (hereinafter referred to as "remaining contamination")

remained beneath the off-site, south- and west-adjoining sidewalks along Jackson Avenue and 43<sup>rd</sup> Avenue. Institutional and Engineering Controls (ICs and ECs) have been incorporated into this OSMP to control exposure to the remaining off-site contamination and provide measures for protection of public health and the environment. Pursuant to the January 2021 RAWP, the Participant entered into CO Index No. S241209-08-09 with the NYSDEC which requires compliance with this OSMP and all ECs and ICs placed on the adjacent off-site sidewalks subject to the CO. The CO was executed on April 20, 2022 and is provided in Appendix A.

This OSMP was prepared to manage remaining off-site contamination until the CO is extinguished, in accordance with Environmental Conservation Law (ECL) Article 27, Title 13. This Plan has been approved by the NYSDEC, and compliance with this Plan is required by the Participant and the Participant's successors and assigns. This OSMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This OSMP details the off-site procedures required by the CO. Failure to properly implement the OSMP is a violation of the CO, which is grounds for revocation of the BCP site's Track 1 Certificate of Completion (COC).
- Failure to comply with this OSMP is also a violation of ECL, Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 375 and the BCA (Index No. C241209-08-09), and thereby subject to applicable penalties.

All reports associated with BCP Site No. C241209 and the surrounding off-site impacts can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the project is provided in Appendix B of this OSMP.

This OSMP was prepared by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan), on behalf of the Participant, 2701 Jackson LLC, in accordance with the requirements of the NYSDEC Division of Environmental Remediation (DER) Program Policy DER-10: Technical Guidance for Site Investigation and Remediation, dated May 3, 2010, and the guidelines provided by the NYSDEC. This OSMP addresses the means for implementing the ICs and ECs that are required by the CO for the off-site property adjacent to the BCP site.

## **1.2 Revisions**

Revisions to the OSMP will be proposed in writing to the NYSDEC's project manager. The NYSDEC can also make changes to the OSMP or request revisions from the remedial party.

Revisions will be necessary upon, but not limited to, a change in groundwater monitoring requirements or other significant change to the CO site conditions. In accordance with the CO, the NYSDEC will provide a notice of any approved changes to the OSMP and append these notices to the OSMP that is retained in its files.

### **1.3 Notifications**

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

1. 60-day advance notice of any proposed changes in CO site use that are required under the terms of the CO, 6 NYCRR Part 375, and/or ECL.
2. 7-day advance notice of any field activity associated with the remedial program conducted by Participant.
3. Notice within 48 hours of any damage or defect to the EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
4. Notice within 48 hours of any non-routine maintenance activities.
5. 60-day advance notice of any proposed changes in responsibility for implementing this OSMP.
6. 15-day post-transfer notice following a transfer in responsibility for implementing this OSMP, including the new responsible party's name, contact representative, and contact information.

Table 1.3 below includes contact information for the above-described notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B. Responsibilities of the Owner and Remedial Party are provided as Appendix C.

**Table 1.3: NYSDEC Notification Contact Information\***

<b>Name</b>	<b>Contact Information</b>	<b>Required Notification**</b>
Shaun Bollers, Project Manager	Phone: (718) 482-4096 Email: <a href="mailto:Shaun.bollers@dec.ny.gov">Shaun.bollers@dec.ny.gov</a>	All Notifications
Cris-Sandra Maycock, Section Chief	Phone: (718) 459-4679 Email: <a href="mailto:cris-sandra.maycock@dec.ny.gov">cris-sandra.maycock@dec.ny.gov</a>	All Notifications
Jane O'Connell, P.G., NYSDEC Regional HW Engineer	Phone: (718) 482-4599 Email: <a href="mailto:Jane.oconnell@dec.ny.gov">Jane.oconnell@dec.ny.gov</a>	All Notifications
Kelly Lewandowski, Site Control	Phone: (518) 402-9569 Email: <a href="mailto:kelly.lewandowski@dec.ny.gov">kelly.lewandowski@dec.ny.gov</a>	Notifications 1 and 6
Julia Kenney, NYSDOH Project Manager	Phone: (518) (518) 402-7873 Email: <a href="mailto:bee@health.state.ny.us">bee@health.state.ny.us</a>	Notifications 3, 5 and 6

\*Notification contacts are subject to change and will be updated as necessary.

\*\*Numbers in this column reference the numbered bullets in the notification list of this section

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## **2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS**

### **2.1 Site Location and Description**

The off-site area within the public right-of-way and sidewalks subject to the CO is an approximately 2,750-square-foot area that spans sections of the Jackson Avenue and 43<sup>rd</sup> Avenue sidewalks adjoining the BCP site located at 27-01 Jackson Avenue in the Long Island City neighborhood of Queens, New York (BCP Site No. C241209), identified as Block 432, Lot 21 on the Queens County Tax Map. The BCP site itself is approximately 9,200 square feet and is bound by a multi-story commercial use building and parking followed by Hunter Street to the north; vacant land and the Ed Koch Queensboro Bridge on-ramp and upper roadway followed by a multi-story commercial use building to the east; Jackson Avenue followed by a multi-story mixed-use building, an active construction site (BCP Site No. C241217), and a parking lot to the south; and 43<sup>rd</sup> Avenue followed by a multi-story industrial use building to the west. The Metropolitan Transit Authority (MTA) "E" and "M" subway lines are located beneath Jackson Avenue directly south of the BCP site. A CO site location map and site plan are provided as Figures 1 and 2, respectively. The owner of the BCP site at the time of issuance of this OSMP is 2701 Property Owner LLC, and the remedial parties responsible for the implementation of this OSMP on the CO site are 2701 Jackson LLC and 2701 Property Owner LLC.

### **2.2 Physical Setting**

#### 2.2.1 Land Use

The BCP site and CO site are located within a Special Long Island City Mixed Use Paired District (M1-5/R9). M1 districts typically include light industrial uses such as woodworking shops, repair shops, and wholesale service and storage facilities, and R9 districts promote residential development. This paired district promotes development and expansion of the longstanding mix of residential, commercial, industrial, and cultural use throughout the area.

Additional information regarding the remediation and redevelopment at the BCP site and CO site is provided in the August 2022 draft Final Engineering Report (FER). With the exception of sidewalk restoration, as required by the New York City Department of Transportation (NYC DOT), the CO site is not included within the footprint of the redevelopment/BCP site.

The neighborhood surrounding the CO site primarily includes multi-story industrial, commercial, and residential buildings, active construction sites, and parking and vacant lots.

### 2.2.2 Geology

The subsurface profile beneath the CO site generally consists of historic fill overlying glacial sand deposits. The fill extends from surface cover to depths ranging from about 9 to 15 feet below grade surface (bgs) and consists of brown, fine- to medium-grained sand with varying amounts of silt, gravel, clay, coal, brick, wood, glass, and concrete. Native soil consists of fine-grained sand with varying amounts of gravel, silt, and clay. The bedrock surface is irregular, generally slopes from the east to west and consists of gray sillimanite-garnet-microcline gneiss. CO site-specific boring logs are provided in Appendix D.

### 2.2.3 Hydrogeology

Prior to dewatering of the BCP site for construction, groundwater was observed in the CO site at depths ranging from about 10.11 to 14.72 feet bgs (elevation [el.] -1.89 and el. -3.49<sup>1</sup>). During a synoptic gauging event on November 10, 2022, groundwater was observed in the CO site at depths ranging from 14.55 to 17.70 feet bgs (el. -1.86 and el. -5.23). Based on these readings, groundwater appears to flow along a shallow gradient towards the west. Based on information provided in the NYSDEC online databases of registered water wells and registered water withdrawals (<http://www.dec.ny.gov/pubs/103459.html>), no private or public wells are located within ½ mile of the CO site.

## **2.3 Investigation and Remedial History**

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the CO site and/or the BCP site as they relate to the CO site. Full titles for each of the reports referenced below are provided in Section 8.0 (References).

### 2.3.1 Site History

The BCP site was developed with multiple two- and three-story buildings between 1889 and 1950. In 1936, the western-most building was operated as a hand laundry facility, and in 1947, the central part of the BCP site operated as a carpenter shop. By 1970, the buildings appear to have been replaced with a gas station and auto repair shop. According to NYSDEC Petroleum Bulk Storage (PBS) database records, ten 550-gallon gasoline underground storage tanks (USTs) were removed from the BCP site in February 2000 and replaced with three 4,000-gallon gasoline USTs and one 4,000-gallon diesel UST (PBS Site No. 2-090565); the 4,000-gallon USTs were subsequently removed in October 2015. During removal of the ten 550-gallon gasoline USTs, petroleum impacts were identified, and a spill was reported to the

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<sup>1</sup> Groundwater elevations are referenced to the North American Vertical Datum of 1988 (NAVD88).



NYSDEC on February 17, 2000, for which Spill No. 9913082 was assigned. NYSDEC closed Spill No. 9913082 on September 7, 2005 following removal and off-site disposal of petroleum-contaminated soil; however, a subsequent subsurface investigation completed in April 2013 identified petroleum impacts and the spill number was reopened.

### 2.3.2 Previous Environmental Reports

The investigations listed below describe conditions prior to implementation of the remedy at the CO site and/or the BCP site as they relate to off-site conditions and were performed to characterize the nature and extent of off-site contamination, provide characterization of subsurface geology, and to develop off-site remediation and mitigation strategies.

- *March 2000 Site Investigation Report, prepared by Cifron Environmental Services, Inc. (CES)*
- *May 19, 2013 Phase II Subsurface Investigation Report, prepared by Advanced Cleanup Technologies, Inc. (ACT)*
- *October 20, 2014 Supplemental Subsurface Investigation Report, prepared by ACT*
- *December 2015 Test Pit Sampling Diagram, prepared by ACT, and January 8, 2016 Technical Report 15L0077, prepared by York Analytical Laboratories (York)*
- *December 2015, Revised Remedial Action Work Plan, prepared by ACT*
- *June 2017 Phase I Environmental Site Assessment (ESA) for 27-01 Jackson Avenue (Block 432, Lot 21), prepared by Langan*
- *August 2019 Waste Characterization Report, prepared by Langan*
- *September 30, 2020 Remedial Investigation Report (RIR), 27-01 Jackson Avenue, Long Island City, New York, prepared by Langan*
- *January 23, 2020 Off-Site In-Situ Treatment Remedial Design Plan, 27-01 Jackson Avenue, Long Island City, New York, prepared by Langan*
- *January 2021 Remedial Action Work Plan, 27-01 Jackson Avenue, Long Island City, New York, prepared by Langan*

### **March 2000 Site Investigation Report prepared by CES**

This Site Investigation Report (SIR) summarizes the February 2000 removal of twelve 550-gallon gasoline USTs and collection of five endpoint soil samples at the BCP site. All samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (collectively, BTEX) and methyl tertiary-butyl ether (MTBE). BTEX compounds were not detected; however, MTBE

was detected at concentrations above 6 NYCRR Part 375 UU Soil Cleanup Objectives (SCOs). Based on field observations during the tank removal and the endpoint soil sample analytical results, a spill was reported to the NYSDEC on February 17, 2000, and Spill No. 9913082 was assigned to the BCP site. The SIR indicates that contaminated soil was excavated after receipt of endpoint sample results; however, additional endpoint sample results confirming removal of soil with MTBE impacts were not provided. Groundwater and soil vapor samples were not collected as part of this investigation. The report also indicates that four 4,000-gallon USTs were installed following removal of the 550-gallon USTs.

NYSDEC closed Spill No. 9913082 on September 7, 2005 after documentation verifying the off-site disposal of 698 tons of contaminated soil; however, a subsequent subsurface investigation completed in April 2013 identified petroleum impacts and the spill number was reopened.

### **May 19, 2013 Phase II Subsurface Investigation Report prepared by ACT**

This report summarizes an April 2013 Phase II subsurface investigation conducted for the then-prospective purchaser of the BCP site to evaluate potential impacts to soil and groundwater related to historical use of the property as a gas station. The investigation of the BCP site included performance of a geophysical survey, advancement of four soil borings, installation of four groundwater monitoring wells, and collection of three soil and two groundwater samples for laboratory analysis of petroleum-related VOCs and SVOCs. Soil vapor samples were not collected as part of this investigation. Field observations and laboratory analytical results are summarized below:

- Petroleum-related VOCs, including ethylbenzene and xylenes, were identified at concentrations above the 6 NYCRR Part 375 UU SCOs in soil samples collected from the southern and western parts of the BCP site. Total xylenes were also identified at a concentration above the 6 NYCRR Part 375 Restricted Use Restricted-Residential (RRU) SCOs in one soil sample collected from the southwest corner of the BCP site.
- Petroleum-related VOCs, including BTEX and MTBE, and SVOCs, including naphthalene, were identified at concentrations above the NYSDEC TOGS 1.1.1 SGVs for Class GA groundwater in groundwater samples collected from the southern and western parts of the BCP site.

Because the Phase II field observations and subsurface investigation results indicated the presence of petroleum contamination at the BCP site, NYSDEC was contacted and the previously closed Spill No. 9913082 reopened.

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### **October 20, 2014 Supplemental Subsurface Investigation Report prepared by ACT**

This report summarizes a June 2013 supplemental subsurface investigation conducted at the BCP site to determine the extent of off-site petroleum-impacted soil and groundwater identified during the April 2013 Phase II subsurface investigation. The investigation included advancement of seven off-site soil borings, installation of a groundwater monitoring well in each boring, and collection of six soil and seven groundwater samples for VOC laboratory analysis. Soil vapor samples were not collected as part of this investigation. Field observations and laboratory analytical results are summarized below:

- Groundwater was observed at a depth of approximately 14 feet bgs, and groundwater was evaluated to flow generally to the southwest towards Jackson Avenue.
- Petroleum-related VOCs, including BTEX, were identified at concentrations above the 6 NYCRR Part 375 UU SCOs in soil samples collected from beneath the south- and west-adjointing sidewalks at the groundwater interface. Ethylbenzene and total xylenes were also identified at concentrations above the 6 NYCRR Part 375 RRU SCOs in one soil sample collected from the south-adjointing sidewalk. Petroleum-related VOCs were not detected above the regulatory criteria in soil samples collected from the sidewalks located across 43<sup>rd</sup> Avenue and Jackson Avenue from the BCP site.
- Petroleum-related VOCs, including BTEX, were identified at concentrations above the NYSDEC TOGS 1.1.1 SGVs in groundwater samples collected from beneath the south- and west-adjointing sidewalks. Petroleum-related VOCs were not detected above the regulatory criteria in groundwater samples collected from the sidewalks located across 43<sup>rd</sup> Avenue and Jackson Avenue from the BCP site.

### **December 2015, Revised Remedial Action Work Plan, prepared by ACT**

This RAWP details the proposed remedy to address petroleum-impacted soil and groundwater on the BCP site and beneath the adjoining off-site sidewalks. ACT's proposed remedial action included excavation and off-site disposal of contaminated soil, collection of endpoint soil samples, collection of post-excavation groundwater samples on a periodic basis, in-situ treatment of on-site and off-site soil and groundwater via application of chemical oxidizers, and construction of a high-density polyethylene (HDPE) vapor barrier system

beneath the proposed building slab. The ACT RAWP was approved by the NYSDEC Division of Environmental Remediation Spill Response Program in March 2016.

**June 2017 Phase I ESA for 27-01 Jackson Avenue (Block 432, Lot 21) prepared by Langan**

Langan performed a Phase I ESA on behalf of American Lions Group and identified the following Recognized Environmental Conditions (RECs) with respect to the CO site:

- Known Petroleum Impacts to Soil and Groundwater: Petroleum-impacted soil and groundwater were identified beneath the BCP site and adjoining off-site sidewalks during subsurface investigations performed in April and June 2013. The impacts are related to the open NYSDEC Spill No. 9913082, which was reported in 2000 during the removal of twelve 550-gallon gasoline USTs, closed in 2005, and re-opened in April 2013 following the aforementioned subsurface investigations.

**September 2020 Remedial Investigation Report for 27-01 Jackson Avenue, prepared by Langan**

Langan implemented the Remedial Investigation (RI) between October 10 and 31, 2018 in accordance with a NYSDEC-approved Remedial Investigation Work Plan (RIWP). Additional off-site RI activity was completed on February 15, 2019; March 13, 2019; June 8 and 9, 2020; and July 24, 2020. The objective of the RI was to characterize the nature and extent of contamination at the BCP site and adjoining off-site sidewalks.

The RI consisted of the following:

- Completion of a geophysical survey to identify potential USTs, underground structures, and utilities
- Advancement of 18 soil borings and collection of 62 grab soil samples (including four duplicate samples)
- Installation of six groundwater monitoring wells and collection of 14 groundwater samples (including one duplicate sample) from the newly installed on-site and existing off-site monitoring wells
- Surveying and synoptic gauging of 13 groundwater monitoring wells for the evaluation of local groundwater flow direction
- Installation of nine soil vapor points and collection of 13 soil vapor samples and two ambient air samples. Seven soil vapor samples were collected as part of the RI. Four

RI soil vapor sampling locations, plus two new sampling locations, were sampled as part of a supplemental soil vapor investigation conducted on July 24, 2020.

- Completion of a Light Non-Aqueous Phase Liquid (LNAPL) Recovery Assessment

The RI concluded the following:

1. Stratigraphy: Historic fill predominantly consisting of brown, fine- to medium-grained sand with varying amounts of silt, gravel, clay, coal, brick, wood, glass, and concrete was encountered across the BCP site and adjoining off-site sidewalks from the surface grade to depths ranging from approximately 6.5 to 22 feet bgs. Native soil encountered below historic fill predominantly consists of fine- to medium-grained sand with varying amounts of gravel, silt, and clay. Lenses of silts with varying amounts of sand and clay, ranging in thickness from approximately 6 inches to 4 feet, were observed in three borings, SB-105, SB-106, and SB-107. The top of bedrock varies across the BCP site from approximately 19 and 45 feet bgs. The bedrock surface is irregular and generally slopes from the east to west. Boring data indicates bedrock is shallowest within the southeastern part of the BCP site.
2. Hydrogeology: Synoptic groundwater measurements were collected on October 24, 2018 from all thirteen of the monitoring wells sampled during the RI. Groundwater elevations range between el. -1.89 to 3.49 feet, which corresponds to depths of approximately 10.11 to 14.72 feet bgs. Groundwater generally flows west but is likely partially influenced by dewatering activities in the south-adjoining subway tunnel, causing a local low point in the groundwater table in the southwestern corner of the BCP site. This local low point results in a secondary groundwater flow direction to the south. Underground utilities and other subsurface structures may locally influence the direction of groundwater flow.
3. Petroleum-Impacted Soil: Soil exhibiting petroleum-related staining, odors, and organic vapors above background concentrations, and containing petroleum-related VOCs at concentrations above the 6 NYCRR Part 375 UU SCOs and/or RRU SCOs was identified in the on-site soil borings SB-101 through SB-104, SB-106 and SB-107, and off-site sidewalk borings SB-202 through SB-205 (ranging from the groundwater table located at approximately 10-14 feet bgs to a depth of approximately 40 feet bgs). Petroleum impacts identified within the capillary fringe or below the water table in the remaining borings is an indication that contamination was transported through the subsurface via groundwater after the removal of source material and USTs from the former storage areas.

4. Historic Fill: Historic fill extends to depths ranging from approximately 6.5 to 22 feet bgs across the BCP site footprint. SVOCs, pesticides, polychlorinated biphenyls (PCBs) and metals were detected at concentrations above the 6 NYCRR Part 375 UU SCOs and/or RRU SCOs in samples collected throughout the BCP site and southern adjoining sidewalk. The detected concentrations are generally typical of historic fill in New York City.
5. Groundwater Impacts: VOCs associated with the former on-site petroleum sources were detected in groundwater. Petroleum-related VOCs were detected above the SGVs in off-site monitoring wells MW-2, MW-3, MW-4, and on-site MW-101, MW-103, MW-106, and MW-107. The well located in the former petroleum bulk storage area 1 (MW-101) contained the highest total VOC concentration (61,532 µg/L) measured at the BCP site. The occurrence of petroleum-impacted groundwater corresponds with the location of the former gasoline filling station and associated open NYSDEC spill. 1
6. Soil Vapor: The soil vapor samples from the northern part of the BCP site and to the northwest across 43rd Avenue contained tetrachloroethene (PCE) and trichloroethene (TCE) at concentrations that exceed the NYSDOH minimum mitigation threshold criteria. A source of chlorinated volatile organic compounds (CVOC) was not identified. Site-wide petroleum-related VOCs detected in the soil vapor are likely related to the open petroleum spill and historic petroleum bulk storage at the BCP site.
7. Off-site LNAPL Impacts: During the initial investigation, two feet of LNAPL was observed in one off-site sidewalk monitoring well (MW-2). The LNAPL was identified as weathered gasoline. The well was bailed and subsequent LNAPL thickness measurements were reduced to approximately 2.88 inches. During the subsequent recovery assessment, approximately 25% of the initial LNAPL volume (0.72 inches) recharged into the well over a four-hour period. Supplemental gauging events in May and October 2019 and April and June 2020 did not identify the presence of LNAPL recharge in the monitoring well.

**January 2020 Off-Site In-Situ Treatment Remedial Design Plan, 27-01 Jackson Avenue, Long Island City, New York, prepared by Langan**

Langan prepared a technical memorandum presenting the groundwater treatment feasibility study and proposed groundwater treatment program, consisting of a series of activated carbon (PetroFix®) injections to remediate residual petroleum-related VOC impacts to groundwater and saturated soil beneath the southern and western off-site sidewalks

adjoining the BCP site. The memorandum also describes the methodology for baseline sampling and post-injection groundwater monitoring to evaluate the efficacy of the treatment.

**January 2021 Remedial Action Work Plan, 27-01 Jackson Avenue, Long Island City, New York, prepared by Langan**

The selected remedy included the following components:

- Development and implementation of a Construction Health and Safety Plan (CHASP) and Community Air Monitoring Program (CAMP) for the protection of on-site workers, community/residents, and the environment during remediation and construction activities
- LNAPL monitoring and removal, as necessary
- Construction of the support of excavation (SOE) system to facilitate the Alternative II remediation
- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations
- Dewatering and groundwater treatment to facilitate SOE installation, remedial excavation and foundation construction
- Excavation, stockpiling, off-site transport, and disposal of historic fill and native soil that exceeds UU SCOs as defined by NYCRR Part 375-6.8
- Removal and decommissioning of any encountered USTs and/or associated appurtenances (e.g., fill lines, vent line, electrical conduit) and disposal off-site during site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC Commissioner's Policy CP-51, and other applicable NYSDEC UST closure requirements
- Appropriate off-site disposal of material removed from the BCP site in accordance with federal, state and local rules and regulations for handling, transport, and disposal
- Collection and analysis of confirmation soil samples, unless bedrock is observed, in accordance with DER-10 to confirm Track 1 SCOs were achieved
- Backfilling of excavated areas to development grade with certified-clean material (meeting Track 1 SCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone.

For off-site contamination, the CO site will achieve the remedial action objectives by: (i) demonstrating a bulk reduction to asymptotic levels in off-site groundwater contamination; (ii) relying on the City's restriction on groundwater use for the off-site area; (iii) entering into

an Off-Site CO with the NYSDEC to implement an OSMP that addresses the remaining off-site contamination. The CO provides that the NYSDEC may revoke the Track 1 COC if the Participant fails to comply with the OSMP. The following tasks will be executed to address off-site contamination:

- Completion of a short-term, off-site in-situ groundwater treatment via injection of PetroFix® within the CO site area; and
- Implementation of an OSMP, including quarterly groundwater sampling of off-site monitoring wells to document groundwater conditions and the effectiveness of the in-situ injection program.

## 2.4 Remedial Action

Objectives for the remedial action program were established through the remedy selection process contained in 6 NYCRR Part 375. Remedial Action Objectives (RAO) for soil, groundwater and soil vapor were established for the BCP site; however, the following RAOs are associated with the areas subject to the CO, as listed in the Decision Document dated February 8, 2021:

RAOs	RAOs for Public Health Protection	RAOs for Environmental Protection
Groundwater	<ul style="list-style-type: none"><li>• Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards</li><li>• Prevent contact with, or inhalation of, volatiles from contaminated groundwater</li></ul>	<ul style="list-style-type: none"><li>• Restore groundwater aquifer to pre-disposal/pre-release conditions to the extent practicable</li></ul>

The on-site remedy was implemented in accordance with the NYSDEC-approved January 2020 In-Situ Treatment Remedial Design Plan and January 2021 Remedial Action Work Plan (RAWP). The BCP site achieved a Track 1 cleanup, which is described in detail in the Final Engineering Report (FER). The following activities were implemented to achieve RAOs with respect to the off-site areas subject to the CO:

1. Collection of groundwater samples for treatability analysis and completion of a groundwater treatment feasibility study and submission of a Professional Engineer (PE) certified Remedial Design - The In-Situ Groundwater Remediation Technical Memorandum, approved by NYSDEC on December 1, 2020.



2. Collection of baseline groundwater samples from existing off-site monitoring wells MW-3 and MW-4 on October 7, 2021 and temporary monitoring wells MW-1 and MW-2 on October 19, 2021 to establish pre-treatment groundwater conditions
3. Implementation of off-site in-situ treatment for residual petroleum-impacted groundwater via injection of Petrofix® along the south- and west-adjointing sidewalks between October 20 and November 11, 2021
4. Dewatering of site groundwater to facilitate remediation - Prior to discharge, groundwater was treated through a granular activated carbon (GAC) treatment system.
5. Reinstallation of off-site groundwater monitoring wells (MW-1 through MW-4) in similar locations to the former off-site monitoring wells
6. Establishment of long-term institutional controls (ICs) in the form of this OSMP and CO – The ICs include prohibitions on the use of groundwater from the CO site to mitigate future exposure pathways.
7. Implementation of quarterly groundwater monitoring as described in this OSMP

#### 2.4.1 Baseline Groundwater Sampling

Baseline groundwater samples were collected from existing off-site monitoring wells MW-3 and MW-4 on October 7, 2021. Monitoring wells MW-1 and MW-2 located along Jackson Avenue were compromised during installation of the support of excavation, and subsequently removed; therefore, temporary monitoring wells were installed and sampled on October 19, 2021 to collect the baseline samples. Temporary wells were installed by Aquifer Drilling and Testing (ADT) of Mineola, New York, and the installation was overseen by Langan personnel. The temporary wells consisted of approximately 10 feet of 1-inch, 0.02-slot, Schedule 40 polyvinyl chloride (PVC) screened from 10 to 20 feet bgs with PVC riser pipe to grade. After baseline sampling was complete, the temporary monitoring wells were removed and the boreholes backfilled with No. 1 sand. Monitoring well construction logs are provided in Appendix E. Monitoring wells MW-3 and MW-4 along 43<sup>rd</sup> Avenue were compromised during installation of the support of excavation, after baseline samples were collected, and subsequently removed. The four monitoring wells were reinstalled for post-remediation groundwater monitoring as discussed in Sections 2.4.3 and 4.3.1.

#### 2.4.2 In-Situ Injection Program and Dewatering

In accordance with the In-Situ Remediation Design Plan, dated January 2020, application of an activated carbon solution (PetroFix™) was chosen as the remedy to reduce petroleum-related VOCs in groundwater. PetroFix™ is a proprietary product developed by Regenesi

Remediation Services that provides an adsorptive media onto which the dissolved VOCs can partition. In turn, attached microbial growth occurs on the surface of the adsorptive media, resulting in contaminant destruction via biodegradation. PetroFix™ employs the techniques of organic polymer dispersion chemistry to suspend activated carbon particles in a colloidal matrix. The PetroFix™ application was followed by a bio-stimulating electron acceptors solution, which component stimulates hydrocarbon biodegradation via added electron acceptors (sulfate and nitrate blend). In turn, the contaminant is degraded or destroyed.

Impacted groundwater was treated via an injection well network (IP-01 through IP-56) in an approximate grid pattern within the off-site, south- and west-adjoining sidewalks comprising the CO site (an approximately 2,750-square-foot area). Injection point locations are provided on Figure 3. The injection program was carried out by Clean Harbors of Norwell, Massachusetts and ADT under the oversight of Langan. Injection points were advanced to approximately 30 feet below sidewalk grade using direct-push drilling methods. At each injection point, a hollow steel injection rod was advanced to depths ranging from about 15 to 30 feet bgs. Injections were made using a “bottom-up” approach, beginning at the deepest 2-foot interval, and raised in 2-foot intervals to approximately 15 feet bgs. Approximately 14,400 pounds of Petrofix® and 720 pounds of electron acceptor blend were applied via direct-push drill rig between October 20 and November 11, 2021. Between 664 and 976 pounds of Petrofix® were applied to each point.

In addition, to facilitate on-site remediation of the BCP site, dewatering occurred from December 2021 to July 2022. Prior to discharge and in accordance with the NYSDEC Long Island Well Permit (LIWP) equivalent, issued on September 16, 2021, New York City Department of Environmental Protection (NYCDEP) discharge permit, groundwater was treated via a two-vessel GAC treatment system to remove petroleum-related VOCs. A copy of the LIWP equivalent and NYCDEP discharge permits are provided in Appendix F.

#### 2.4.3 Post-Remediation Quarterly Groundwater Well Installation and Monitoring

Four post-remediation groundwater monitoring wells (MW-1 through MW-4) were reinstalled on August 22, 2022 and October 13 and 14, 2022 to evaluate the efficacy of the remedy. Monitoring wells MW-1, MW-3, and MW-4 are constructed with 10-feet of 2-inch-diameter, Schedule 40 PVC, 0.02-inch slotted screens attached to solid risers and are installed to a depth of about 20 feet bgs. Due to limited space between the site SOE and abutting New York City Transit (NYCT) structure beneath Jackson Avenue, MW-2 was constructed with 10-feet of 1-inch-diameter, Schedule 40 PVC, 0.02-inch slotted screens attached to solid riser and is installed to a depth of about 20 feet bgs. Each well annulus contains No. 2 filter sand between the bottom of the well and a depth of about 7 to 12 feet bgs (i.e., two feet above

the screened interval), followed by a grout/bentonite seal to grade. The monitoring wells were finished with flush-mounted road boxes. The wells were developed using a submersible Monsoon® pump or peristaltic pump with a check valve until purged groundwater appeared clear, and were then allowed to stabilize until the first quarterly sampling event in October 2022. Monitoring well construction logs are provided in Appendix E.

This OSMP describes the results of the Q4 2022 sampling event. The results of the ongoing quarterly sampling events will be provided to NYSDEC in a quarterly groundwater monitoring reports.

## **2.5 Remaining Contamination**

### 2.5.1 Soil

Soil samples were collected from the CO site at the request of NYSDEC as part of the Off-Site Soil Investigation conducted in June 2020. Petroleum-related VOCs were not identified in the vadose zone above the water table. SVOCs, pesticides and/or metals were identified in one or more surficial soil samples collected from the CO area at concentrations consistent with historic fill quality in New York City. Soil samples were not collected from the impacted interval; however, petroleum-related impacts (e.g., odor, staining, organic vapors) were limited to the soil column at and below the groundwater table to depths ranging from approximately 20 to 30 feet bgs.

### 2.5.2 Groundwater

Petroleum-related VOCs were identified at concentrations above the SGVs in groundwater in the off-site, south- and west-adjointing sidewalks along Jackson Avenue and 43<sup>rd</sup> Avenue during the RI. The impacts were attributed to the former gasoline filling station operations and associated NYSDEC spill on the BCP site. An in-situ groundwater treatment program was completed concurrent with the remedial excavation and four post-remediation monitoring wells were re-installed on the southern- and western-adjointing sidewalks, within the treatment area, to monitor performance of the injections.

Prior to implementation of groundwater treatment and on-site dewatering, baseline groundwater samples were collected from the four off-site wells as described in Section 2.4.1. During the baseline sampling event, VOCs were detected below the SGVs in wells MW-3 and MW-4, with exception of n-propylbenzene in MW-3, which exceeded the applicable SGV. Monitoring wells MW-1 and MW-2 were compromised during SOE construction; therefore, baseline samples were collected from temporary one-inch monitoring wells installed in place of the former MW-1 and MW-2. Petroleum-related VOCs

detected in temporary well MW-2 were within the same order of magnitude as the concentrations detected during the RI, and petroleum-related VOC concentrations in temporary well MW-1 were one to two orders of magnitude higher than concentrations detected during the RI. Consistent with the RI results, the highest VOC concentrations were identified in temporary well MW-2, located on the western part of Jackson Avenue fronting the BCP site. As described in Section 4.2.1, permanent monitoring wells were re-installed in all four well locations prior to the Q4 2022 sampling event.

During the Q4 2022 sampling event, VOC concentrations were below SGVs in monitoring wells MW-1, MW-3 and MW-4. The decrease in VOC concentrations observed in these monitoring wells ranged from one to two orders of magnitude below the baseline samples. Several VOCs (acetone, 1,2,4-trimethylbenzene, ethylbenzene, m- and p-xylenes, and total xylenes) were identified above SGVs in MW-2; however, total VOC concentrations in monitoring well MW-2 decreased from 9,585 micrograms per liter (µg/l) in the baseline sample to 81.59 µg/l in the Q4 2022 sample, and individual VOC concentrations decreased one to three orders of magnitude below the baseline sample. The results of the Q4 2022 sampling even support the efficacy of the remedy, which will be documented over subsequent monitoring events. The following table summarizes exceedances of the SGVs in groundwater during the Q4 2022 sampling event:

Analyte	MW-1		MW-2		
	MW01_101921	MW-1_102122	MW02_101921	MW-2_102022	DUP01_102022
	10/19/2021	10/21/2022	10/19/2021	10/20/2022	10/20/2022
<b>Volatile Organic Compounds</b>					
1,2,4,5-Tetramethylbenzene	<b>12</b>	1.9 J	<b>130</b>	1.4 J	4.2 J
1,2,4-Trimethylbenzene	<b>11</b>	0.77 J	<b>1,900</b>	<b>10 J</b>	<b>34 J</b>
1,3,5-Trimethylbenzene (Mesitylene)	<b>7.8</b>	4	<b>540</b>	3.5 J	<b>8 J</b>
Acetone	4.5 J	25	<50 U	<b>56</b>	<b>63</b>
Benzene	<b>17</b>	<0.5 U	<b>2.1 J</b>	0.69	0.35 J
Ethylbenzene	<b>54</b>	<2.5 U	<b>890</b>	<b>5.9</b>	4
Isopropylbenzene (Cumene)	<b>10</b>	<2.5 U	<b>190</b>	3	3.5
M,P-Xylene	<b>11</b>	1.3 J	<b>2,300</b>	<b>16</b>	<b>14</b>
Naphthalene	3.4 J	<2.5 U	<b>460 J</b>	<2.5 U	3
n-Butylbenzene	<b>5.6</b>	<2.5 U	<b>25</b>	<2.5 U	0.93 J
n-Propylbenzene	<b>17</b>	<2.5 U	<b>370</b>	2.8 J	<b>5.7 J</b>
o-Xylene (1,2-Dimethylbenzene)	<b>9.1</b>	<2.5 U	<b>410</b>	2 J	1.9 J
Sec-Butylbenzene	4.6	<2.5 U	<b>18 J</b>	<2.5 U	0.83 J
Toluene	<b>5.3</b>	<2.5 U	<b>130</b>	0.7 J	1 J
Total Xylenes	<b>20</b>	1.3 J	<b>2,700</b>	<b>18 J</b>	<b>16 J</b>

Analyte	MW-3		MW-4		
	MW03_100721	MW-3_102122	MW04_100721	WDUP01_10072	MW-4_102122
	10/07/2021	10/21/2022	10/07/2021	10/07/2021	10/21/2022
<b>Volatile Organic Compounds</b>					
1,2,4,5-Tetramethylbenzene	2	<2 U	<2 U	<2 U	<2 U
1,2,4-Trimethylbenzene	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
1,3,5-Trimethylbenzene (Mesitylene)	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Acetone	2.9 J	1.8 J	<5 U	<5 U	<5 U
Benzene	0.16 J	<0.5 U	0.17 J	0.2 J	<0.5 U
Ethylbenzene	4.8	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Isopropylbenzene (Cumene)	3.8	<2.5 U	<2.5 U	<2.5 U	<2.5 U
M,P-Xylene	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Naphthalene	2 J	<2.5 U	0.95 J	<2.5 U	<2.5 U
n-Butylbenzene	<2.5 U	<2.5 U	0.88 J	0.87 J	<2.5 U
n-Propylbenzene	<b>9.4 J</b>	<2.5 U	<2.5 U	<2.5 U	<2.5 U
o-Xylene (1,2-Dimethylbenzene)	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Sec-Butylbenzene	<2.5 U	<2.5 U	3	3	<2.5 U
Toluene	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Total Xylenes	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U

Concentrations exceeding the NYSDEC SGVs are in bold and shaded

A full summary of the groundwater data is provided in Table 1 and shown on Figure 5.

Quarterly groundwater monitoring will continue for a minimum of eight monitoring events, unless data indicates that groundwater monitoring can be discontinued sooner, as approved by the NYSDEC. In the event rebound occurs and additional treatment is required, a supplemental work plan will be provided to NYSDEC and NYSDOH for review prior to implementation of additional treatment.

Exposure to remaining groundwater contamination is prevented by a 4-inch-thick concrete sidewalk slab. Additionally, New York City does not permit the use of groundwater as a potable water source; therefore, there is no complete exposure pathway under these conditions. Additional institutional controls, including the CO, prevent exposure to residual impacted groundwater as discussed in Section 3.2.

### **3.0 INSTITUTIONAL CONTROL (IC) PLAN**

#### 3.1 General

Because residual groundwater contamination may remain off-site, ICs are required to protect human health and the environment. This IC Plan describes the procedures for implementation and management of all ICs. The IC Plan is one component of the OSMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all ICs;
- The basic implementation and intended role of each IC;
- A description of the key components of the ICs outlined in this OSMP;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of ICs; and
- Any other provisions necessary to identify or establish methods for implementing the ICs required by the CO site remedy, as determined by the NYSDEC project manager.

#### **3.2 Institutional Controls**

As outlined in the February 8, 2021 Decision Document, the Participant has entered into a CO with the NYSDEC. The CO acts as an IC to:

1. Require compliance with the Department approved OSMP; and,
2. Require the remedial party to complete and submit to NYSDEC a periodic certification of ICs in accordance with Part 375-1.8(h)(3);

Adherence to these ICs is required by the CO and will be implemented pursuant to this OSMP. ICs listed below may not be discontinued without an amendment to or extinguishment of the CO, as approved by the NYSDEC. These ICs are:

- Environmental monitoring (i.e., groundwater sampling) must be performed as defined in this OSMP.
- The use of groundwater underlying the CO site is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or New York City Department of Health (NYCDOH) to render it

safe for use as drinking water or for industrial purposes, and the Participant must first notify and obtain written approval to do so from the NYSDOH or NYCDOH;

- Data and information pertinent to site management must be reported at the frequency and in the manner specified in this OSMP;
- Groundwater monitoring wells must be protected and replaced as necessary to ensure proper functioning in the manner specified in this OSMP;
- Groundwater monitoring may not be discontinued without an amendment or extinguishment of the CO - The CO may be extinguished only by release by the Commissioner of the NYSDEC, or the Commissioner's designee;
- Compliance with the CO by the Participant and the Participant's successors and adherence of all elements of this OSMP is required;
- All future activities that will disturb remaining contaminated groundwater must be conducted in accordance with this OSMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as specified in this OSMP; and
- Participant must provide all persons who undertake responsibility for the implementation of the CO site remedy a complete copy of the OSMP that the NYSDEC approves for the CO site and all NYSDEC-approved amendments to the OSMP.

## **4.0 MONITORING AND SAMPLING PLAN**

### **4.1 General**

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC project manager. Any work conducted pursuant to the OSMP will be conducted in accordance with the procedures defined in the Health and Safety Plan (HASP) provided in Appendix G. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management are included in the Quality Assurance Project Plan (QAPP) provided in Appendix H.

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

- Sampling and analysis of groundwater;
- Assessing compliance with applicable NYSDEC standards, criteria and guidelines (SCGs); and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

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

- Sampling locations, protocol and frequency;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells; and
- Monitoring well decommissioning procedures.

Reporting requirements are provided in Section 7.0 of this OSMP.

### **4.2 Post-Remediation Media Monitoring and Sampling**

Groundwater sampling will be performed to monitor the treatment and reduction of petroleum contaminants in off-site groundwater. Post-injection monitoring will continue on a quarterly basis to evaluate the efficacy of the off-site remedy, until bulk reduction of remaining groundwater contamination to asymptotic levels is achieved, and the Department determines that monitoring is no longer needed. Sampling locations, analytical parameters, and sampling frequencies are provided in Table 4.2 – Post-Remediation Sampling Requirements and Schedule. It is anticipated that a minimum of eight quarterly groundwater monitoring events



will be completed. Pending the laboratory analytical results, a written request to modify the sampling frequency and/or requirements may be submitted to the NYSDEC for approval. This OSMP will be revised to reflect changes in sampling plans approved by the NYSDEC.

**Table 4.2 – Post Remediation Sampling Requirements and Schedule**

<b>Sampling Location</b>	<b>Location ID</b>	<b>Analytical Parameter &amp; Method</b>	<b>Sampling Frequency</b>
On-Site Groundwater Monitoring Wells (Lot 59)	MW-1, MW-2, MW-3, and MW-4	VOCs (USEPA Method 8260C)	Quarterly for two years, at which time frequency will be reassessed

4.2.1 Monitoring Well Installation

During installation of SOE for the BCP site, the four off-site monitoring wells were compromised and subsequently removed. Monitoring wells MW-1 through MW-4 were reinstalled on August 22, 2022 and October 13 and 14, 2022; two monitoring wells were installed on each sidewalk (Jackson Avenue and 43<sup>rd</sup> Avenue) as shown on Figure 5. Monitoring wells MW-1, MW-3, and MW-4 are constructed with 10-feet of 2-inch-diameter, Schedule 40 PVC, 0.02-inch slotted screens attached to solid risers and are installed to a depth of about 20 feet bgs. Due to limited space between the site SOE and abutting New York City Transit (NYCT) structure beneath Jackson Avenue, MW-2 was constructed with 10-feet of 1-inch-diameter, Schedule 40 PVC, 0.02-inch slotted screens attached to solid riser and are installed to a depth about 20 feet bgs. Each well annulus contains No. 2 filter sand between the bottom of the well and a depth of about 7 to 12 feet bgs (i.e., two feet above the screened interval), followed by a grout/bentonite seal to grade. The monitoring wells were finished with flush-mounted road boxes.

Following installation, the monitoring wells were surged and developed with a submersible Monsoon® pump or peristaltic pump with a check valve until the water became clear (i.e., turbidity less than 50 Nephelometric Turbidity Units [NTU]). Purged groundwater was stored in a labeled 55-gallon DOT-approved drum staged on-site pending off-site disposal.

During monitoring well installation, community air monitoring was conducted in compliance with the NYSDOH generic guidance for CAMP implementation.

4.2.2 Groundwater Sampling

Groundwater monitoring will be performed on a quarterly basis to assess the effectiveness of the in-situ remedy and BCP site dewatering. The network of monitoring wells will be used to monitor residual VOC contamination in groundwater. Samples will be collected in accordance with the procedures in the USEPA’s low-flow groundwater sampling procedure

("Low Stress [low flow] Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells", EQASOP-GW 001, January 19, 2010) to allow for collection of a representative sample. Groundwater samples will be collected and analyzed for EPA Target Compound List (TCL) VOCs by a NYSDOH ELAP-certified laboratory. Monitoring wells will be gauged with an oil/water interface probe and sampled under the direction of a professional engineer. Should LNAPL be observed, the LNAPL will be collected using a bailer for laboratory analysis for total petroleum hydrocarbons and characterization via "fingerprint analysis." Depth to water readings, and product thickness, if encountered, will be recorded. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 4.4.1 – On-Site Monitoring Well Construction Details, summarizes the well identification number, location, depth, diameter, and screened interval for each monitoring point.

**Table 4.4.1 – Monitoring Well Construction Details**

Well ID	Well Diameter (inches)	Latitude			Longitude			Well Casing Elevation (feet)	Screen Interval (feet below grade)
		Deg	Min	Sec	Deg	Min	Sec		
MW-1	2	40	44	51.8208	-73	56	27.6858	12.47	9 to 19
MW-2	1	40	44	51.7020	-73	56	28.0782	12.24	10 to 20
MW-3	2	40	44	51.8742	-73	56	28.5174	12.55	14 to 24
MW-4	2	40	44	52.2168	-73	56	28.7262A	12.69	13.5 to 23.5

Off-Site Monitoring Well Construction Details will be provided following installation, in accordance with the work plan provided as Appendix E.

During each groundwater sampling event, purged groundwater (if generated) will be collected into 55-gallon UN/DOT-approved drums, transported off-site, and disposed of at facility permitted to accept such material. Purge water characterization sampling will be completed in conformance with the requirements of the disposal facility.

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

The NYSDEC will be notified prior to repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process

will be documented in the subsequent Periodic Review Report (PRR). Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC Policy CP-43 Groundwater Monitoring Well Decommissioning Policy. Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The sampling frequency may only be modified with the approval of the NYSDEC. This OSMP will be modified to reflect changes in sampling plans approved by the NYSDEC. Deliverables for the groundwater monitoring program are specified in Section 7.0 (Reporting Requirements). Locations of the monitoring wells are shown on Figure 3. Monitoring well construction logs are included in Appendix E. Detailed sample collection and analytical procedures and protocols are provided in the QAPP (Appendix H) and Field Sampling Plan (Appendix I).

#### 4.2.3 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book or tablet. Other observations (e.g., groundwater monitoring well condition assessment) will be noted on the appropriate sampling log, which will serve as the inspection form for the monitoring network. Additional details regarding monitoring and sampling protocols are provided in the site-specific Field Sampling Plan (Appendix I).

## **5.0 OPERATION AND MAINTENANCE PLAN**

### **5.1 General**

The CO site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such systems is not included in this OSMP.

## **6.0 PERIODIC ASSESSMENTS AND EVALUATIONS**

### **6.1 Climate Change Vulnerability Assessment**

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

The CO site consists of sidewalks and does not contain any buildings or systems in which electrical services are required. Therefore, the CO site is not considered vulnerable to climate change factors.

### **6.2 Green Remediation Evaluation**

NYSDEC's Program Policy DER-31: Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program, including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the OSMP provides a summary of any green remediation evaluations to be completed for the CO site during site management, and as reported in the Periodic Review Report (PRR).

Waste generated during periodic groundwater sampling events includes purged groundwater which will be containerized in 55-gallon UN/DOT-approved drums. To minimize the number of drums for disposal and the frequency of drum pickups, the drums will be used to containerize the purged groundwater collected during the course of several monitoring and sampling events and will be transported off-site for disposal once they become full.

## 7.0. REPORTING REQUIREMENTS

### 7.1 Site Management Reports

All CO site monitoring and sampling events will be recorded in the field log as described in Appendix I. The results of each quarterly groundwater sampling event will be submitted to NYSDEC in a quarterly sampling report; these reports are subject to NYSDEC revision. All CO site monitoring events will be conducted by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

Applicable sampling forms and other records, including media sampling data generated for the CO site during the reporting period, will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 7.1 and summarized in the subsequent PRR.

**Table 7.1: Schedule of Interim Monitoring Reports**

<b>Monitoring Program</b>	<b>Reporting Frequency*</b>
Groundwater Sampling Event Results	Quarterly reporting for two years, after which frequency will be reassessed
Periodic Review Report	Annually

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

The quarterly reporting will include, at a minimum:

- Date of sampling event;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Number and type of samples collected;
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating the data compared to baseline concentrations;

- Copies of all laboratory data sheets and the laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

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

## **7.2 Periodic Review Report**

A PRR will be submitted to the Department beginning 16 months after the COC is issued. After submittal of the initial PRR, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the property at 27-01 Jackson Avenue (BCP Site No. C241209) is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the CO site described in Appendix A (CO). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the PRR. The report will include:

- Identification, assessment and certification of all ICs/ECs required by the remedy for the CO site
- All applicable site management forms and other records generated for the CO site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted
- Counter-signed manifests and weight tickets (as applicable) for wastes transported and disposed of off-site during the reporting period (i.e., purged groundwater collected during a groundwater sampling event)
- Tables and figures that include a presentation of past data as part of an evaluation of contaminant concentration trends, including but not limited to:
  - Trend monitoring graphs that present groundwater contaminant levels from before the commencement of remedy implementation to the most current sampling data
  - A current contaminant plume map depicting the extent of remaining groundwater contamination beneath the CO site

- A groundwater elevation contour map for each gauging event
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as identified by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQUIS™ database in accordance with the requirements found at this link: <http://www.dec.ny.gov/chemical/62440.html>.
- A site evaluation and effectiveness summary, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific Decision Document;
  - The operation and effectiveness of the remedy, including identification of any necessary repairs or modifications;
  - Any new conclusions or observations regarding site contamination based on inspections or data generated pursuant to the Monitoring and Sampling Plan (Section 4.0) for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan (Section 5.0);
  - Trends in contaminant levels in the affected media that are evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document;
  - The overall effectiveness of the remedy; and
  - Comments, conclusions, and recommendations based on data evaluation.

#### 7.2.1 Certification of Institutional Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the PRR, the following certification per the requirements of NYSDEC DER-10:

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

- *The inspection of the CO site to confirm the effectiveness of the ICs required by the remedial program was performed under my direction;*
- *The ICs employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*



- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the CO site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the CO site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the CO site is compliant with the CO;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the CO site remedial program and generally accepted engineering practices; and*
- *No new information has come to my attention, including groundwater monitoring data from wells located at the CO site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*
- *The information presented in this report is accurate and complete.*

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

*I, **Jason J. Hayes**, P.E. of Langan, have been authorized and designated by the site owner to sign this certification for the site."*

Every five years the following certification will be added, unless otherwise approved by NYSDEC:

- *Based on the available site data, the assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the PRR.

The PRR will be submitted, in approved electronic format, to the NYSDEC Central Office, NYSDEC Regional Office in which the CO site is located, and the NYSDOH Bureau of Environmental Exposure Investigation. The PRR may also need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

### **7.3 Corrective Measures Work Plan**

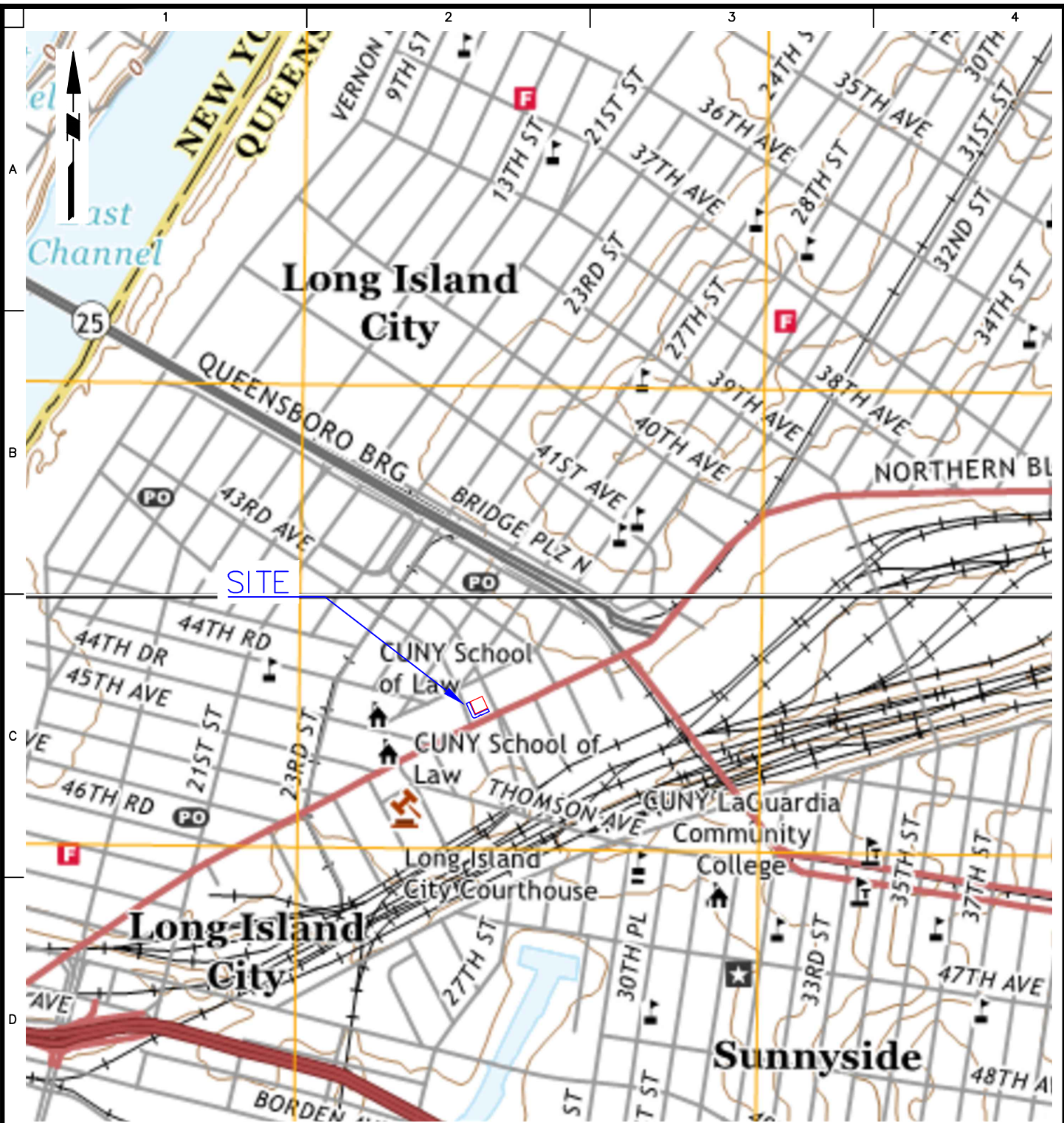
If any component of the remedy is discovered to have failed, or if the periodic certification cannot be provided due to the failure of an IC or EC or failure to conduct site management activities, a Corrective Measures Work Plan will be submitted to the NYSDEC project manager for approval. This Plan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

## **8.0 REFERENCES**

The following references were reviewed as part of this OSMP:

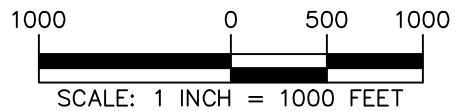
1. 6 NYCRR Part 375 – Environmental Remediation Programs (December 14, 2006).
2. 6 NYCRR Part 703.5 – Water Quality Standards (January 31, 2017).
3. NYSDEC – Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 (June 1998, April 2000 addendum).
4. NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation (May 2010).
5. NYSDEC DER-31 – Green Remediation (August 2010).
6. CES, Site Investigation Report, dated March 2000
7. ACT, Phase II Subsurface Investigation Report, dated May 19, 2013
8. ACT, Supplemental Subsurface Investigation Report, dated October 20, 2014
9. ACT, Technical Report 15L0077, dated January 8, 2016
10. ACT, Revised Remedial Action Work Plan, dated December 2015
11. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Phase I Environmental Site Assessment for 27-01 Jackson Avenue (Block 432, Lot 21), dated June 2017
12. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Off-Site In-Situ Treatment Remedial Design Plan, dated January 23, 2020
13. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Remedial Investigation Report, dated September 2020.
14. Decision Document for 27-01 Jackson Avenue, prepared by NYSDEC, dated February 8, 2021
15. Order on Consent and Administrative Settlement for 27-01 Jackson Avenue (Index No. S241209-08-09), prepared by NYSDEC, dated June 23, 2022

## **FIGURES**



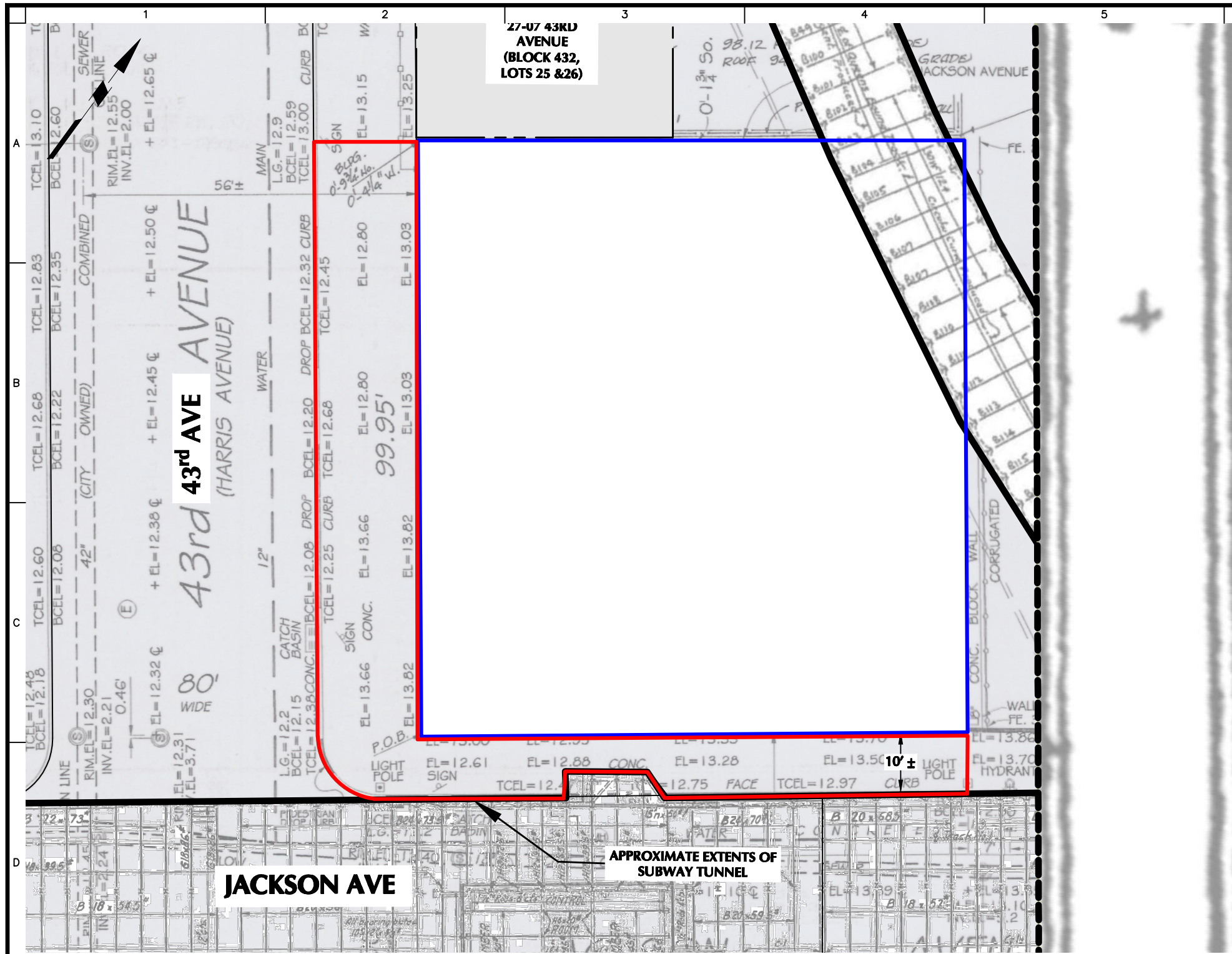
**LEGEND**

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE BOUNDARY OF BROWNFIELD CLEANUP PROGRAM SITE NO. C241209



NOTE: BASE MAP IS REFERENCED FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5 MINUTE SERIES CENTRAL PARK AND BROOKLYN QUADRANGLE MAPS, DATED 2019.

<p>LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com</p>	Project	Figure Title	Project No.	Figure No.
	<b>27-01 JACKSON AVENUE</b>	<b>SITE LOCATION MAP</b>	170472002	1
	BLOCK No. 4321, LOT No. 21		Date	
	QUEENS NEW YORK		06/01/2022	
			Drawn By	
			LH	
			Checked By	
			KS	

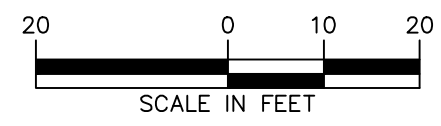


**LEGEND**

- APPROXIMATE BOUNDARY OF BROWNFIELD CLEANUP PROGRAM SITE NO. C241209
- APPROXIMATE SITE BOUNDARY

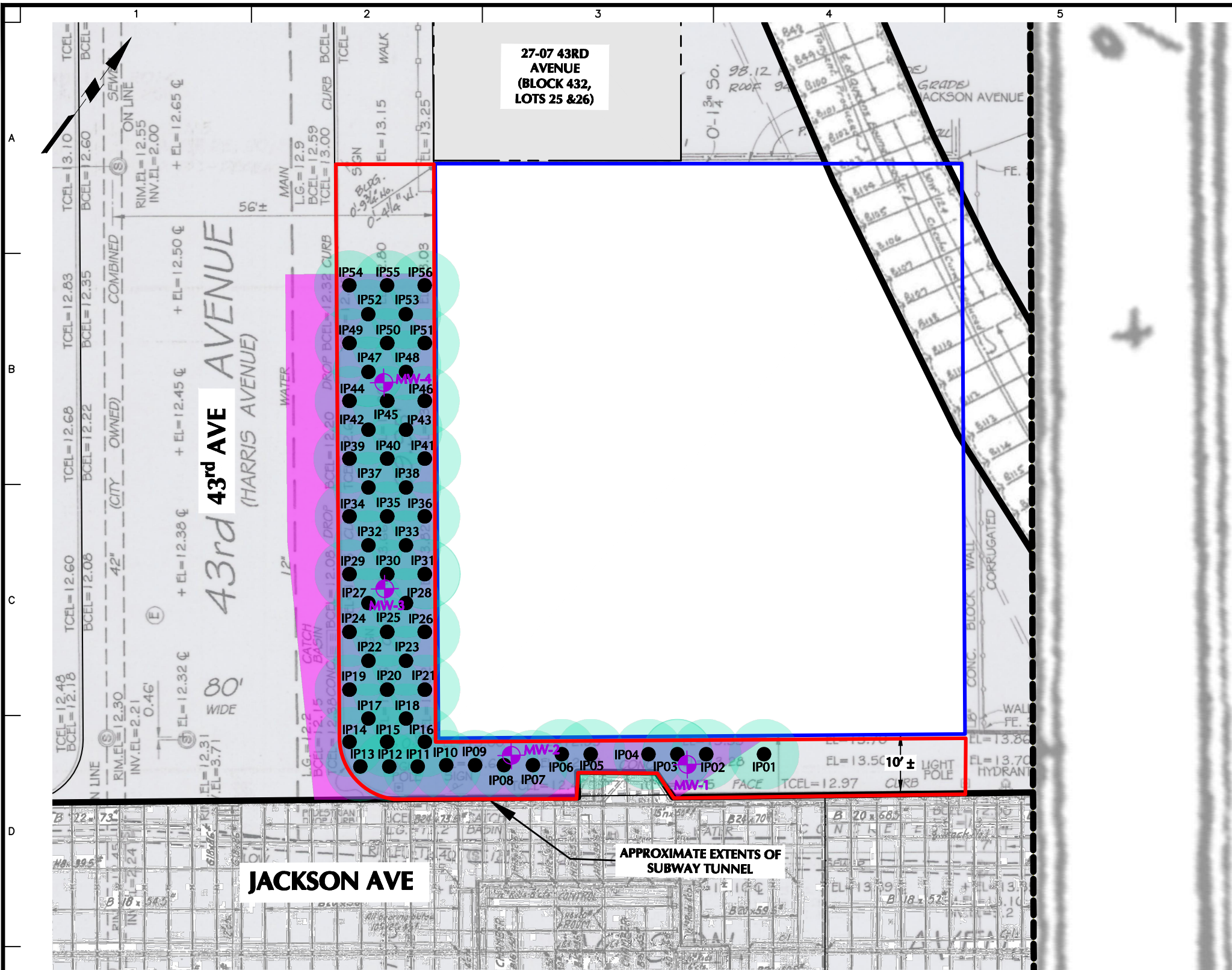
**NOTES**

1. BASEMAP TAKEN FROM HAYNES LAND SURVEYORS, DATED ON NOVEMBER 12, 2014.
2. SITE BOUNDARIES ARE APPROXIMATE



**WARNING:** IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

<p><b>LANGAN</b></p> <p>Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.</p> <p>21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001</p> <p>T: 212.479.5400 F: 212.479.5444 www.langan.com</p>	Project	Figure Title	Project No.	Figure No.
	<p><b>27-01 JACKSON AVENUE</b></p> <p>BLOCK No. 432 LOT No. 21</p>	<p><b>SITE LAYOUT PLAN</b></p>	170472002	<p><b>2</b></p>
	QUEENS	NEW YORK	Date	
			07/06/2022	
			Drawn By	
			LH	
			Checked By	
			KS	



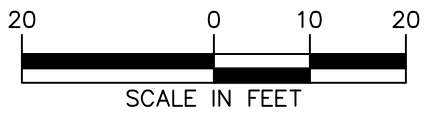
**LEGEND**

- APPROXIMATE BOUNDARY OF BROWNFIELD CLEANUP PROGRAM SITE NO. C241209
- APPROXIMATE SITE BOUNDARY
- IP01**  
● INJECTION POINT LOCATION
- APPROXIMATE RADIUS OF INFLUENCE FOR PETROFIX
- APPROXIMATE EXTENT OF OFF-SITE PETROLEUM PLUME
- MW-1**  
⊕ MONITORING WELL LOCATION

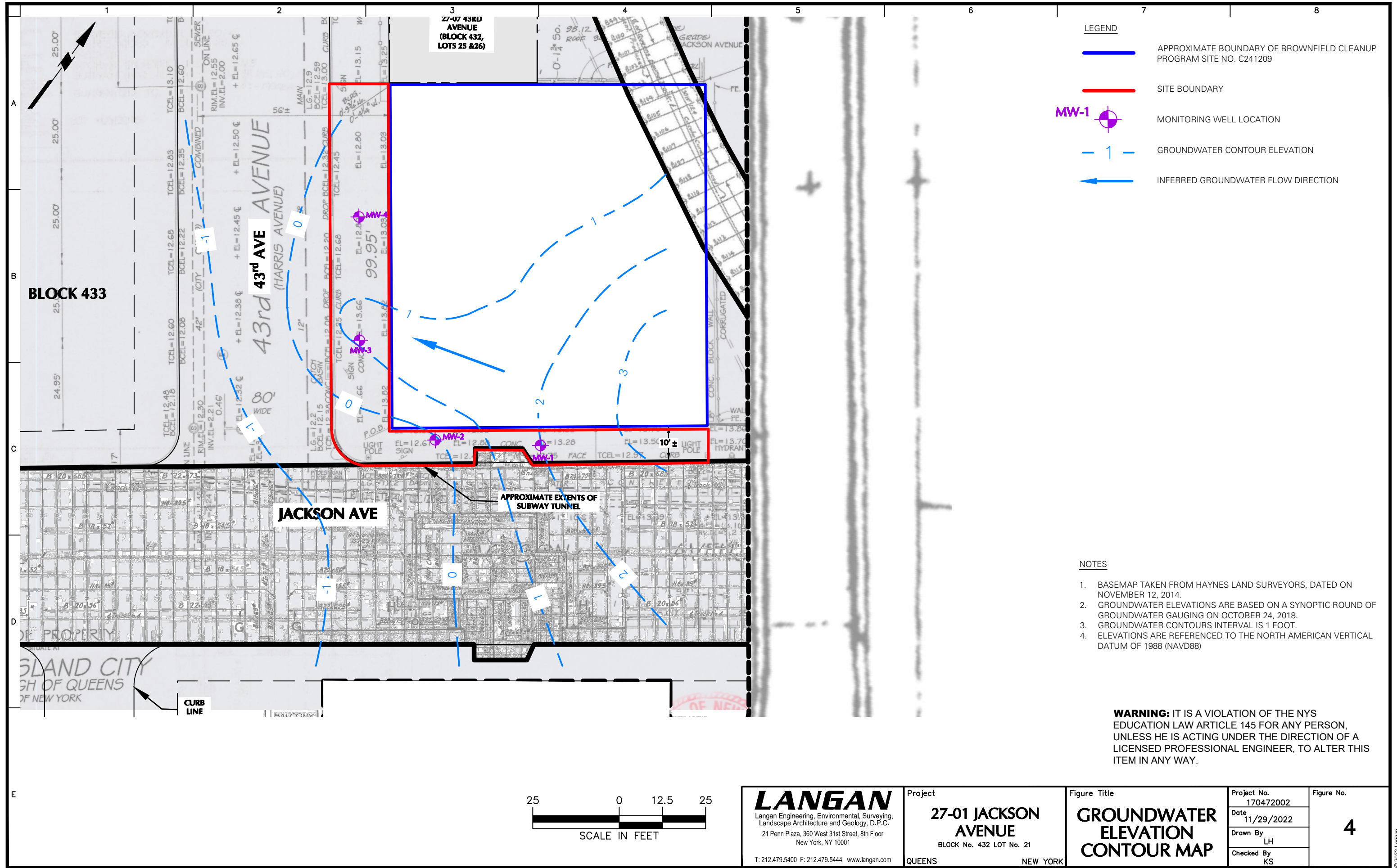
**NOTES**

1. BASEMAP TAKEN FROM HAYNES LAND SURVEYORS, DATED NOVEMBER 12, 2014.
2. INJECTIONS WERE COMPLETED BETWEEN OCTOBER 20, 2021 AND NOVEMBER 11, 2021.
3. RADIUS OF INFLUENCE CALCULATIONS WERE DETERMINED IN CONSULTATION WITH REMEDIAL CHEMICAL MANUFACTURERS BASED ON SUBSURFACE CONDITIONS AND CONTAMINANT CONCENTRATIONS ENCOUNTERED DURING THE REMEDIAL INVESTIGATION CONDUCTED BY LANGAN.
4. ALL INJECTION AND MONITORING WELL LOCATIONS ARE APPROXIMATE.
5. ELEVATIONS (EL.) ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1983 (NAVD83).

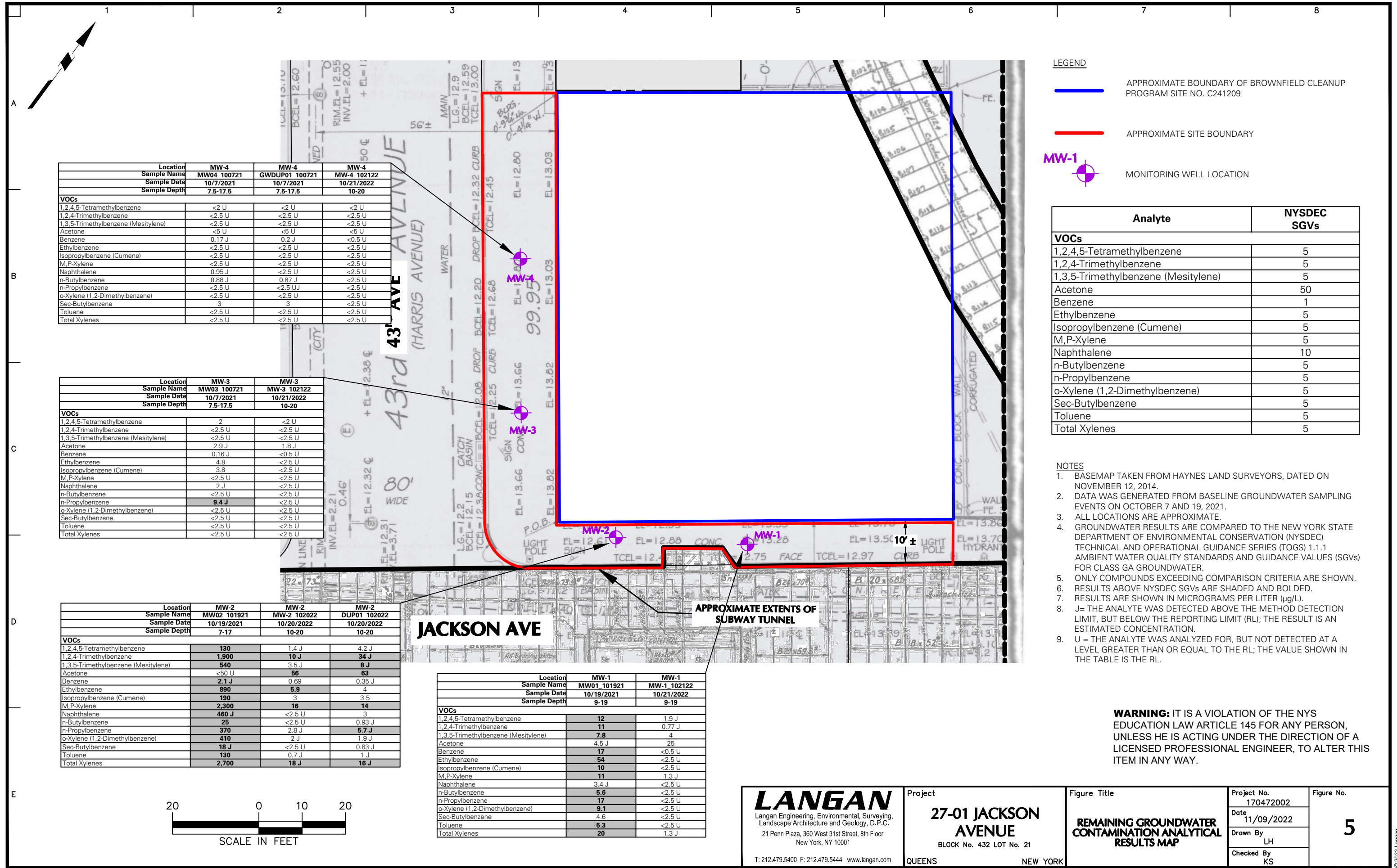
**WARNING:** IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.



<b>LANGAN</b> Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project <b>27-01 JACKSON AVENUE</b> BLOCK No. 432 LOT No. 21 QUEENS NEW YORK	Figure Title <b>IN-SITU GROUNDWATER TREATMENT INJECTION PLAN</b>	Project No. 170472002	Figure No. <b>3</b>
			Date 11/17/2022	
			Drawn By LH	
			Checked By KS	







## TABLE

Table 1
Remaining Groundwater Contamination Analytical Results

27-01 Jackson Avenue
Long Island City, New York
NYSDEC BCP Site No.: C241209
Langan Project No.: 170472002

Table with 13 columns: Analyte, CAS Number, NYSDEC SGVs, Sampling Event (Location, Sample Name, Sample Date), and Baseline/Quarter 1 results for MW-1, MW-2, MW-3, MW-4 at various monitoring wells. Includes Volatile Organic Compounds and various chemical species like Benzene, Chlorobenzene, etc.

**Table 1**  
**Remaining Groundwater Contamination Analytical Results**

27-01 Jackson Avenue  
Long Island City, New York  
NYSDEC BCP Site No.: C241209  
Langan Project No.: 170472002

**Notes:**

CAS - Chemical Abstract Service

NS - No standard

ug/l - microgram per liter

NA - Not analyzed

RL - Reporting limit

<RL - Not detected

Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 703.5 and the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water (herein collectively referenced as "NYSDEC SGVs").

**Qualifiers:**

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

UJ - The analyte was not detected at a level greater than or equal to the RL; however, the reported RL is approximate and may be inaccurate or imprecise.

U - The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

**Exceedance Summary:**

**10** - Result exceeds NYSDEC SGVs

**APPENDIX A**  
**ORDER ON CONSENT**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
STATE SUPERFUND PROGRAM  
ECL §27-1301 *et seq.*

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In the Matter a Remedial Program for

**ORDER ON CONSENT AND  
ADMINISTRATIVE SETTLEMENT  
Index No. S241209-08-09**

**DEC Site Name: 27-01 Jackson Avenue**

DEC Site No.: S241209

Site Address: 27-01 Jackson Avenue, Long Island City, New York 11101

Hereinafter referred to as "Site"

by: 2701 Jackson LLC  
2701 Property Owner LLC  
RESPONDENT

Hereinafter referred to as "Respondent"

---

1. A. The New York State Department of Environmental Conservation ("Department") is responsible for inactive hazardous waste disposal site remedial programs pursuant to Article 27, Title 13 of the Environmental Conservation Law ("ECL") and Part 375 of Title 6 of the Official Compilation of Codes, Rules and Regulations ("6 NYCRR") and may issue orders consistent with the authority granted to the Commissioner by such statute.

B. The Department is responsible for carrying out the policy of the State of New York to conserve, improve and protect its natural resources and environment and control water, land, and air pollution consistent with the authority granted to the Department and the Commissioner by Article 1, Title 3 of the ECL.

C. This Order is issued pursuant to the Department's authority under, *inter alia*, ECL Article 27, Title 13 and ECL 3-0301, and resolves Respondent's liability to the State as provided at 6 NYCRR 375-1.5(b)(5).

2. 2701 Jackson LLC and 2701 Property Owner LLC (collectively, "Respondent") are applicants in the Brownfield Cleanup Program ("BCP" or the "Program") for the site located at 27-01 Jackson Avenue, Long Island City, NY 11101, Queens County Tax Block 432, Lot 21 (hereinafter the "BCP Site"). Exhibit "A" is a map of the BCP Site showing its general location. The BCP Site is currently not listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State, but is identified as BCP Site Number C241209 with a Classification A pursuant to ECL § 27-1305. Upon the

issuance of a Certificate of Completion (“COC”), the BCP Site will be reclassified as a Class C Site. The off-Site area subject to this Order is currently not listed in the Registry of Inactive Hazardous Waste Disposal Sites, but is identified by the Department as Site Number S241209 with a Classification A pursuant to ECL § 27-1305.

3. Respondent is a “Participant” in the Program, and there is off-site contamination for which Respondent is responsible.

4. Respondent has achieved a Track 1 Unrestricted Use cleanup on the BCP Site, and the Department intends to issue a Track 1 COC.

5. Respondent has achieved the remedial action objectives for the BCP Site by demonstrating a bulk reduction in on-site groundwater contamination to asymptotic levels without meeting drinking water standards; there is a restriction on groundwater use for the on-site area under NYC Health Code Article 141.

6. Respondent consents to the issuance of this Order without (i) an admission or finding of liability, fault, wrongdoing, or violation of any law, regulation, permit, order, requirement, or standard of care of any kind whatsoever; (ii) an acknowledgment that there has been a release or threatened release of hazardous waste at or from the BCP site; and/or (iii) an acknowledgment that a release or threatened release of hazardous waste at or from the Site constitutes a significant threat to the public health or environment.

7. Respondent and the Department agree that the primary goals of this Order are to provide a mechanism for Respondent to implement any necessary off-site groundwater remedial measures and associated site management and to memorialize Respondent’s continuing obligation to address the off-site contamination through compliance with the Site Management Plan (“SMP”).

8. Solely with regard to the matters set forth below, Respondent hereby waives any right to a hearing as may be provided by law, consents to the issuance and entry of this Order, and agrees to be bound by its terms. Respondent consents to and agrees not to contest the authority or jurisdiction of the Department to issue or enforce this Order and agrees not to contest the validity of this Order or its terms or the validity of data submitted to the Department by Respondent pursuant to this Order.

**NOW**, having considered this matter and being duly advised, **IT IS ORDERED THAT:**

I. Real Property

The off-Site contamination subject to this Order has been assigned number S241209, and consists of the area adjacent and downgradient from the BCP Site described as:

Subject Property Description (A Map of the BCP Site and the area of off-Site contamination is attached as Exhibit "A")

Tax Map/Parcel No.: Block 432, Lot 21  
27-01 Jackson Avenue  
Long Island City, NY, 11101  
Owner: 2701 Property Owner LLC

II. Site Management Plan

The applicant will submit a draft SMP before or together with a draft Final Engineering Report.

III. Payment of State Costs

Invoices shall be sent to Respondent at the following address:

Aaron Shirian  
2701 Jackson LLC  
425 Northern Boulevard, Suite #6  
Great Neck, NY 11021

Albert Shirian, Hal Fetner  
2701 Property Owner LLC  
675 Third Avenue  
New York, NY 10017

IV. Communications

A. All written communications required by this Consent Order shall be transmitted by United States Postal Service, by private courier service, by hand delivery, or by electronic mail.

1. Communication from Respondent shall be sent to:

Shaun Bollers (1 hard copy (unbound for work plans) & 1 electronic copy)  
New York State Department of Environmental Conservation  
Division of Environmental Remediation



47-40 21st Street  
Long Island City, New York, 11101  
[Shaun.bollers@dec.ny.gov](mailto:Shaun.bollers@dec.ny.gov)

Julia Kenney (electronic copy only)  
New York State Department of Health  
Bureau of Environmental Exposure Investigation  
Empire State Plaza  
Corning Tower Room 1787  
Albany, NY 12237  
[julia.kenney@health.ny.gov](mailto:julia.kenney@health.ny.gov)

2. Communication from the Department to Respondent shall be sent to:

Aaron Shirian  
2701 Jackson LLC  
425 Northern Boulevard, Suite #6  
Great Neck, NY 11021  
[aaron.shirian@lionsgroupnyc.com](mailto:aaron.shirian@lionsgroupnyc.com)

B. The Department and Respondent reserve the right to designate additional or different addressees for communication on written notice to the other. Additionally, the Department reserves the right to request that the Respondent provide more than one paper copy of any work plan or report.

C. Each party shall notify the other within ninety (90) days after any change in the addresses listed in this paragraph or in Paragraph I.

V. No Further Action/Satisfactory Completion

The Department will not issue a Certificate of Completion ("COC") but rather will issue a No Further Action/Satisfactory Completion Letter ("Letter") to Respondent upon Respondent's demonstration that no further monitoring or treatment is required to address off-site groundwater contamination, and the Department agrees to terminate the SMP. The Letter's form and substance shall be materially similar to the attached Exhibit B.

VI. Compliance

Failure to comply with a required SMP is a violation of this Order and/or any COC issued by the Department. Respondent acknowledges that a violation of the Order is grounds for revocation of any Department-issued COC.

VII. Miscellaneous

A. Appendix A - "Standard Clauses for All New York State, State Superfund Orders" is attached to and hereby made a part of this Order as if set forth fully herein, with the exception of the requirement to submit a Citizen Participation Plan.

B. In the event of a conflict between the terms of this Order (including any and all attachments thereto and amendments thereof) and the terms of Appendix A, the terms of this Order shall control.

C. The effective date of this Order is the 10th day after it is signed by the Commissioner or the Commissioner's designee.

DATED: April 20, 2022

BASIL SEGGOS  
COMMISSIONER  
NEW YORK STATE DEPARTMENT OF  
ENVIRONMENTAL CONSERVATION

By: *Susan Edwards*

---

Susan Edwards, P.E., Acting Director  
Division of Environmental Remediation

CONSENT BY RESPONDENT

Respondent hereby consents to the issuing and entering of this Consent Order, waives Respondent's right to a hearing herein as provided by law, and agrees to be bound by this Consent Order.

2701 Jackson LLC

By: [Signature]  
Title: Acron Shiran  
Date: 2/24/22

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

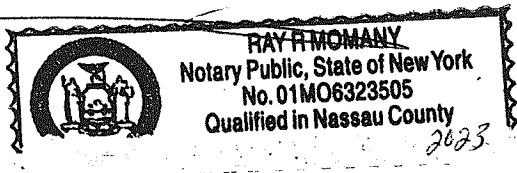
On the 24<sup>th</sup> day of FEBRUARY in the year 2022, before me, the undersigned, personally appeared Acron Shiran (full name) personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

*Acknowledgment by a corporation, in New York State:*

On the \_\_\_\_\_ day of \_\_\_\_\_ in the year 20\_\_, before me, the undersigned, personally appeared \_\_\_\_\_ (full name) personally known to me who, being duly sworn, did depose and say that he/she/they reside at \_\_\_\_\_ (full mailing address) and that he/she/they is (are) the \_\_\_\_\_ (president or other officer or director or attorney in fact duly appointed) of the \_\_\_\_\_

(full legal name of corporation), the corporation described in and which executed the above instrument; and that he/she/they signed his/her/their name(s) thereto by the authority of the board of directors of said corporation.

[Signature]  
\_\_\_\_\_  
Notary Public, State of New York



CONSENT BY RESPONDENT

Respondent hereby consents to the issuing and entering of this Consent Order, waives Respondent's right to a hearing herein as provided by law, and agrees to be bound by this Consent Order.

2701 Property Owner LLC

By: [Signature]  
Title: Albert Shirian  
Date: 2/24/22

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

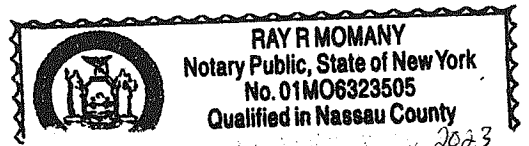
On the 24<sup>th</sup> day of FEBRUARY in the year 2022, before me, the undersigned, personally appeared ALBERT Shirian (full name) personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

*Acknowledgment by a corporation, in New York State:*

On the \_\_\_\_\_ day of \_\_\_\_\_ in the year 20\_\_\_\_, before me, the undersigned, personally appeared \_\_\_\_\_ (full name) personally known to me who, being duly sworn, did depose and say that he/she/they reside at \_\_\_\_\_ (full mailing address) and that he/she/they is (are) the \_\_\_\_\_ (president or other officer or director or attorney in fact duly appointed) of the \_\_\_\_\_

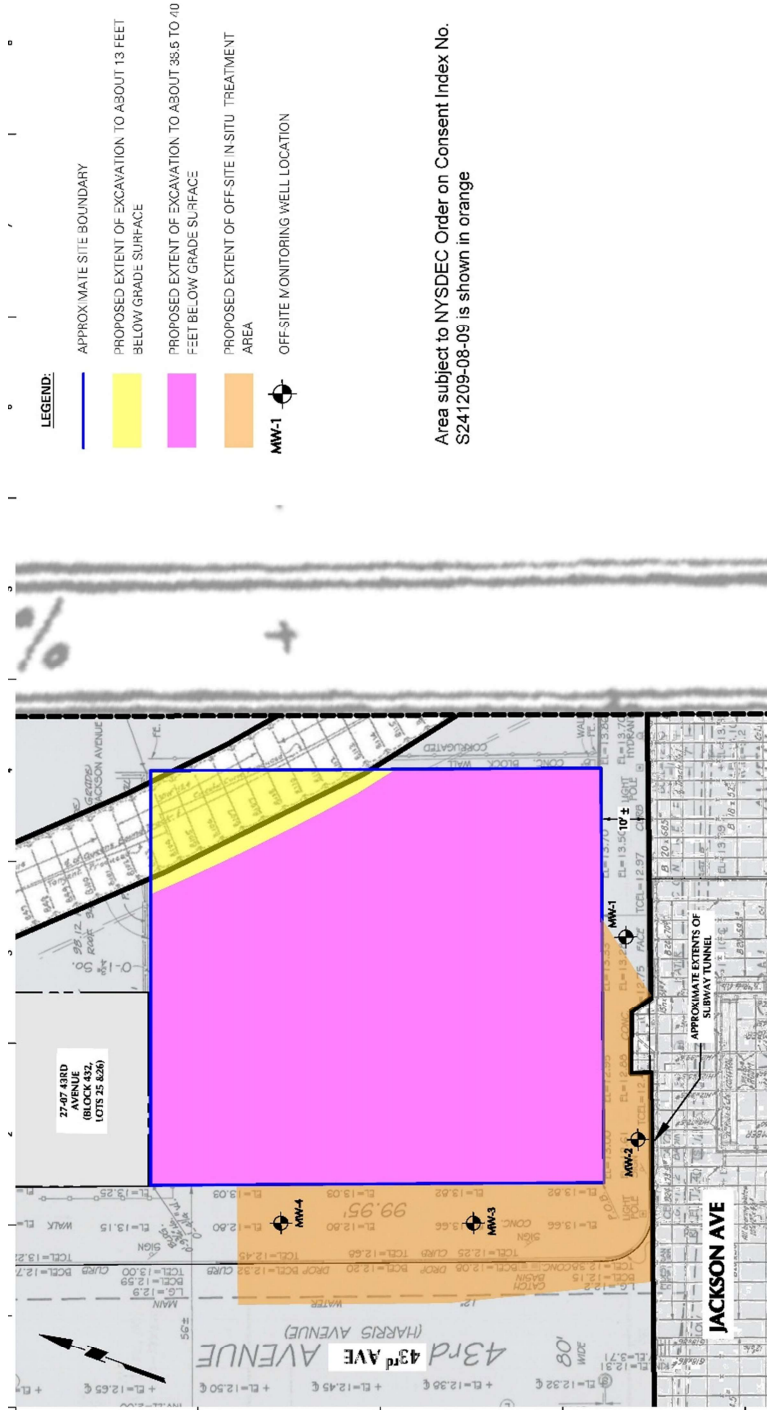
(full legal name of corporation), the corporation described in and which executed the above instrument; and that he/she/they signed his/her/their name(s) thereto by the authority of the board of directors of said corporation.

[Signature]



# EXHIBIT "A"

## Map



**EXHIBIT "B"**

**DATE**

Aaron Shirian  
2701 Jackson LLC  
425 Northern Boulevard, Suite #6  
Great Neck, NY 11021

Albert Shirian, Hal Fetner  
2701 Property Owner LLC  
675 Third Avenue  
New York, NY 10017

RE: Satisfactory Completion Letter/No Further Action Letter  
Site No.: S241209  
Site Name: 27-01 Jackson Avenue

Dear Respondent:

This letter is sent to notify Respondent that it has satisfactorily completed all site management activities for the remediation project that Respondent undertook under the Consent Order Index No. S241209-08-09 for the off-site contamination affiliated with the 27-01 Jackson Avenue, Long Island City, NY site (Tax Block 432, Lot 21) ("Site"). As such, the Department has determined, subject to the Department's reservation of rights outlined below, contained in the Consent Order, or existing at law, based upon our inspection of the above-referenced Site and upon our review of the documents you have submitted, that you completed the project in accordance with the terms and conditions of the above-referenced Order and no further remedial action is necessary. As a result, the Department is issuing this Satisfactory Completion/No Further Action Letter for the project.

Notwithstanding that the Department has determined that no further remedial action is necessary with the respect to the off-site contamination affiliated with the Site, the Department reserves any and all rights and authority, including rights concerning any claim for natural resource damages or the authority to engage in or require any further investigation or remediation the Department deems necessary. The Department retains all its respective rights concerning circumstances where Respondent, their lessees, sublessees, successors, or assigns cause or permit a Release or threat of

Release at the site of any hazardous substance (as that term is defined at 42 USC 9601[14]) or petroleum (as that term is defined in Navigation Law § 172[15]).

Additionally, with respect to the off-site contamination, nothing contained in this letter shall be construed to:

- preclude the State of New York on behalf of the New York State Environmental Protection and Spill Compensation Fund from recovering a claim of any kind or nature against any party;
- prejudice any rights of the Department to take any investigatory action or remediation or corrective measures it may deem necessary if Respondent fails to comply with the Order or if contamination other than contamination within the present knowledge of the Department is encountered;
- prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers.

If you have any questions, please do not hesitate to contact Shaun Bollers, site project manager, at 718-482-4096.

Sincerely,

Susan Edwards, P.E., Acting Director  
Division of Environmental Remediation

Department's Copies:

ec: Gerard Burke  
Jane O'Connell  
Jennifer Andaloro  
Kelly Lewandowski  
Shaun Bollers  
Grace Nam

Applicant's Copies:

ec: Aaron Shirian ([aaron.shirian@lionsgroupnyc.com](mailto:aaron.shirian@lionsgroupnyc.com))  
Albert Shirian ([albert.shirian@lionsgroupnyc.com](mailto:albert.shirian@lionsgroupnyc.com))  
Hal Fetner ([hal@fetner.com](mailto:hal@fetner.com))  
Michael Bogin ([mbogin@sprlaw.com](mailto:mbogin@sprlaw.com))  
Mimi Raygorodetsky ([mraygorodetsky@langan.com](mailto:mraygorodetsky@langan.com))

**APPENDIX "A"**

**STANDARD CLAUSES FOR ALL NEW YORK STATE  
STATE SUPERFUND ORDERS**



The parties to the State Superfund Order (hereinafter "Order") agree to be bound by the following clauses which are hereby made a part of the Order. The word "Respondent" herein refers to any party to the Order, other than the New York State Department of Environmental Conservation (hereinafter "Department").

I. Citizen Participation Plan

Within twenty (20) days after the effective date of this Order, Respondent shall submit for review and approval a written citizen participation plan prepared in accordance with the requirements of ECL §27-1417 and 6 NYCRR sections 375-1.10 and 375-3.10. Upon approval, the Citizen Participation Plan shall be deemed to be incorporated into and made a part of this Order.

II. Initial Submittal

Within thirty (30) days after the effective date of this Order, Respondent shall submit to the Department a Records Search Report prepared in accordance with Exhibit "B" attached to the Order. The Records Search Report can be limited if the Department notifies Respondent that prior submissions satisfy specific items required for the Records Search Report.

III. Development, Performance, and Reporting of Work Plans

A. Work Plan Requirements

All activities at the Site that comprise any element of an Inactive Hazardous Waste Disposal Site Remedial Program shall be conducted pursuant to one or more Department-approved work plans ("Work Plan" or "Work Plans") and this Order and all activities shall be consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, as required under CERCLA, 42 U.S.C. § 9600 *et seq.* The Work Plan(s) under this Order shall address both on-Site and off-Site conditions and shall be developed and implemented in accordance with 6 NYCRR § 375-1.6(a), 375-3.6, and 375-6. All Department-approved Work Plans shall be incorporated into and become enforceable parts of this Order. Upon approval of a Work Plan by the Department, Respondent shall implement such Work Plan in accordance with the schedule contained therein. Nothing in this Subparagraph shall mandate that any particular Work Plan be submitted.

The Work Plans shall be captioned as follows:

1. Site Characterization ("SC") Work Plan: a Work Plan which provides for the identification of the presence of any hazardous waste disposal at the Site;
2. Remedial Investigation/Feasibility Study ("RI/FS") Work Plan: a Work Plan which provides for the investigation of the nature and extent of contamination within the boundaries of the Site and emanating from such Site and a study of remedial alternatives to address such on-site and off-site contamination;
3. Remedial Design/Remedial Action ("RD/RA") Work Plan: a Work Plan which provides for the development and implementation of final plans and specifications for implementing the remedial alternative set forth in the ROD;
4. "IRM Work Plan" if the Work Plan provides for an interim remedial measure;
5. "Site Management Plan" if the Work Plan provides for the identification and implementation of institutional and/or engineering controls as well as any necessary monitoring and/or operation and maintenance of the remedy; or

6. "Supplemental" if additional work plans other than those set forth in II.A.1-5 are required to be prepared and implemented.

**B. Submission/Implementation of Work Plans**

1. Respondent may opt to propose one or more additional or supplemental Work Plans (including one or more IRM Work Plans) at any time, which the Department shall review for appropriateness and technical sufficiency.

2. Any proposed Work Plan shall be submitted for the Department's review and approval and shall include, at a minimum, a chronological description of the anticipated activities, a schedule for performance of those activities, and sufficient detail to allow the Department to evaluate that Work Plan.

i. The Department shall notify Respondent in writing if the Department determines that any element of a Department-approved Work Plan needs to be modified in order to achieve the objectives of the Work Plan as set forth in Subparagraph III.A or to ensure that the Remedial Program otherwise protects human health and the environment. Upon receipt of such notification, Respondent shall, subject to dispute resolution pursuant to Paragraph XV, modify the Work Plan.

ii. The Department may request, subject to dispute resolution pursuant to Paragraph XV, that Respondent submit additional or supplemental Work Plans for the Site to complete the current remedial phase within thirty (30) Days after the Department's written request.

3. A Site Management Plan, if necessary, shall be submitted in accordance with the schedule set forth in the IRM Work Plan or Remedial Work Plan.

4. During all field activities conducted under a Department-approved Work Plan, Respondent shall have on-Site a representative who is qualified to supervise the activities undertaken in accordance with the provisions of 6 NYCRR 375-1.6(a)(3).

5. A Professional Engineer must stamp and sign all Work Plans other than SC or RI/FS Work Plans.

**C. Submission of Final Reports and Periodic Reports**

1. In accordance with the schedule contained in a Work Plan, Respondent shall submit a final report as provided at 6 NYCRR 375-1.6(b) and a final engineering report as provided at 6 NYCRR 375-1.6(c).

2. Any final report or final engineering report that includes construction activities shall include "as built" drawings showing any changes made to the remedial design or the IRM.

3. In the event that the final engineering report for the Site requires Site management, Respondent shall submit an initial periodic report by in accordance with the schedule in the Site Management Plan and thereafter in accordance with a schedule determined by the Department. Such periodic report shall be signed by a Professional Engineer or by such other qualified environmental professional as the Department may find acceptable and shall contain a certification as provided at 6 NYCRR 375-1.8(h)(3). Respondent may petition the Department for a determination that the institutional and/or engineering controls may be terminated. Such petition must be supported by a statement by a Professional Engineer that such controls are no longer necessary for the protection of public health and the environment. The Department shall not unreasonably withhold its approval of such petition.

4. Within sixty (60) days of the Department's approval of a Final Report, Respondent shall submit such additional Work Plans as is required by the Department in its approval letter of such Final Report. Failure to submit any additional Work Plans within such period shall be a violation of this Order.

D. Review of Submittals

1. The Department shall make a good faith effort to review and respond in writing to each submittal Respondent makes pursuant to this Order within sixty (60) Days. The Department's response shall include, in accordance with 6 NYCRR 375-1.6(d), an approval, modification request, or disapproval of the submittal, in whole or in part.

i. Upon the Department's written approval of a Work Plan, such Department-approved Work Plan shall be deemed to be incorporated into and made a part of this Order and shall be implemented in accordance with the schedule contained therein.

ii. If the Department modifies or requests modifications to a submittal, it shall specify the reasons for such modification(s). Within fifteen (15) Days after the date of the Department's written notice that Respondent's submittal has been disapproved, Respondent shall notify the Department of its election in accordance with 6 NYCRR 375-1.6(d)(3). If Respondent elects to modify or accept the Department's modifications to the submittal, Respondent shall make a revised submittal that incorporates all of the Department's modifications to the first submittal in accordance with the time period set forth in 6 NYCRR 375-1.6(d)(3). In the event that Respondent's revised submittal is disapproved, the Department shall set forth its reasons for such disapproval in writing and Respondent shall be in violation of this Order unless it invokes dispute resolution pursuant to Paragraph XV and its position prevails. Failure to make an election or failure to comply with the election is a violation of this Order.

iii. If the Department disapproves a submittal, it shall specify the reasons for its disapproval. Within fifteen (15) Days after the date of the Department's written notice that Respondent's submittal has been disapproved, Respondent shall notify the Department of its election in accordance with 6 NYCRR 375-1.6(d)(4). If Respondent elects to modify the submittal, Respondent shall make a revised submittal that addresses all of the Department's stated reasons for disapproving the first submittal in accordance with the time period set forth in 6 NYCRR 375-1.6(d)(4). In the event that Respondent's revised submittal is disapproved, the Department shall set forth its reasons for such disapproval in writing and Respondent shall be in violation of this Order unless it invokes dispute resolution pursuant to Paragraph XV and its position prevails. Failure to make an election or failure to comply with the election is a violation of this Order.

2. Within thirty (30) Days after the Department's approval of a final report, Respondent shall submit such final report, as well as all data gathered and drawings and submittals made pursuant to such Work Plan, in an electronic format acceptable to the Department. If any document cannot be converted into electronic format, Respondent shall submit such document in an alternative format acceptable to the Department.

E. Department's Issuance of a ROD

1. Respondent shall cooperate with the Department and provide reasonable assistance, consistent with the Citizen Participation Plan, in soliciting public comment on the proposed remedial action plan ("PRAP"), if any. After the close of the public comment period, the Department shall select a final remedial alternative for the Site in a ROD. Nothing in this Order shall be construed to abridge any rights of Respondent, as provided by law, to judicially challenge the Department's ROD.

2. Respondent shall have 60 days from the date of the Department's issuance of the ROD to notify the Department in writing whether it will implement the remedial activities required by such ROD. If

the Respondent elects not to implement the required remedial activities, then this order shall terminate in accordance with Paragraph XIV.A. Failure to make an election or failure to comply with the election is a violation of this Order.

F. Institutional/Engineering Control Certification

In the event that the remedy for the Site, if any, or any Work Plan for the Site, requires institutional or engineering controls, Respondent shall submit a written certification in accordance with 6 NYCRR 375-1.8(h)(3) and 375-3.8(h)(2).

IV. Penalties

A. 1. Respondent's failure to comply with any term of this Order constitutes a violation of this Order, the ECL, and 6 NYCRR 375-2.11(a)(4). Nothing herein abridges Respondent's right to contest any allegation that it has failed to comply with this Order.

2. Payment of any penalties shall not in any way alter Respondent's obligations under this Order.

B. 1. Respondent shall not suffer any penalty or be subject to any proceeding or action in the event it cannot comply with any requirement of this Order as a result of any Force Majeure Event as provided at 6 NYCRR 375-1.5(b)(4). Respondent must use best efforts to anticipate the potential Force Majeure Event, best efforts to address any such event as it is occurring, and best efforts following the Force Majeure Event to minimize delay to the greatest extent possible. "Force Majeure" does not include Respondent's economic inability to comply with any obligation, the failure of Respondent to make complete and timely application for any required approval or permit, and non-attainment of the goals, standards, and requirements of this Order.

2. Respondent shall notify the Department in writing within five (5) Days of the onset of any Force Majeure Event. Failure to give such notice within such five (5) Day period constitutes a waiver of any claim that a delay is not subject to penalties. Respondent shall be deemed to know of any circumstance which it, any entity controlled by it, or its contractors knew or should have known.

3. Respondent shall have the burden of proving by a preponderance of the evidence that (i) the delay or anticipated delay has been or will be caused by a Force Majeure Event; (ii) the duration of the delay or the extension sought is warranted under the circumstances; (iii) best efforts were exercised to avoid and mitigate the effects of the delay; and (iv) Respondent complied with the requirements of Subparagraph IV.B.2 regarding timely notification.

4. If the Department agrees that the delay or anticipated delay is attributable to a Force Majeure Event, the time for performance of the obligations that are affected by the Force Majeure Event shall be extended for a period of time equivalent to the time lost because of the Force Majeure event, in accordance with 375-1.5(4).

5. If the Department rejects Respondent's assertion that an event provides a defense to non-compliance with this Order pursuant to Subparagraph IV.B, Respondent shall be in violation of this Order unless it invokes dispute resolution pursuant to Paragraph XV and Respondent's position prevails.

V. Entry upon Site

A. Respondent hereby consents, upon reasonable notice under the circumstances presented, to entry upon the Site (or areas in the vicinity of the Site which may be under the control of Respondent) by any duly designated officer or employee of the Department or any State agency having jurisdiction with

respect to matters addressed pursuant to this Order, and by any agent, consultant, contractor, or other person so authorized by the Commissioner, all of whom shall abide by the health and safety rules in effect for the Site, for inspecting, sampling, copying records related to the contamination at the Site, testing, and any other activities necessary to ensure Respondent's compliance with this Order. Upon request, Respondent shall (i) provide the Department with suitable work space at the Site, including access to a telephone, to the extent available, and (ii) permit the Department full access to all non-privileged records relating to matters addressed by this Order. Raw data is not considered privileged and that portion of any privileged document containing raw data must be provided to the Department. In the event Respondent is unable to obtain any authorization from third-party property owners necessary to perform its obligations under this Order, the Department may, consistent with its legal authority, assist in obtaining such authorizations.

B. The Department shall have the right to take its own samples and scientific measurements and the Department and Respondent shall each have the right to obtain split samples, duplicate samples, or both, of all substances and materials sampled. The Department shall make the results of any such sampling and scientific measurements available to Respondent.

#### VI. Payment of State Costs

A. Within forty-five (45) days after receipt of an itemized invoice from the Department, Respondent shall pay to the Department a sum of money which shall represent reimbursement for State Costs as provided by 6 NYCRR 375-1.5 (b)(3)(i). Failure to timely pay any invoice will be subject to late payment charge and interest at a rate of 9% from the date the payment is due until the date the payment is made.

B. Costs shall be documented as provided by 6 NYCRR 375-1.5(b)(3). The Department shall not be required to provide any other documentation of costs, provided however, that the Department's records shall be available consistent with, and in accordance with, Article 6 of the Public Officers Law.

C. Each such payment shall be made payable to the New York State Department of Environmental Conservation and shall be sent to:

Director, Bureau of Program Management  
Division of Environmental Remediation  
New York State Department of Environmental Conservation  
625 Broadway  
Albany, New York 12233-7012

D. The Department shall provide written notification to the Respondent of any change in the foregoing addresses.

E. If Respondent objects to any invoiced costs under this Order, the provisions of 6 NYCRR 375-1.5 (b)(3)(v) and (vi) shall apply. Objections shall be sent to the Department as provided under subparagraph VI.C above.

F. In the event of non-payment of any invoice within the 45 days provided herein, the Department may seek enforcement of this provision pursuant to Paragraph IV or the Department may commence an enforcement action for non-compliance with ECL '27-1423 and ECL 71-4003.

#### VII. Release and Covenant Not to Sue

Upon the Department's issuance of a Certificate of Completion as provided at 6 NYCRR 375-1.9 and 375-2.9, Respondent shall obtain the benefits conferred by such provisions, subject to the terms and conditions described therein.

## VIII. Reservation of Rights

A. Except as provided at 6 NYCRR 375-1.9 and 375-2.9, nothing contained in this Order shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the Department's rights or authorities, including, but not limited to, the right to require performance of further investigations and/or response action(s), to recover natural resource damages, and/or to exercise any summary abatement powers with respect to any person, including Respondent.

B. Except as otherwise provided in this Order, Respondent specifically reserves all rights and defenses under applicable law respecting any Departmental assertion of remedial liability and/or natural resource damages against Respondent, and further reserves all rights respecting the enforcement of this Order, including the rights to notice, to be heard, to appeal, and to any other due process. The existence of this Order or Respondent's compliance with it shall not be construed as an admission of liability, fault, wrongdoing, or breach of standard of care by Respondent, and shall not give rise to any presumption of law or finding of fact, or create any rights, or grant any cause of action, which shall inure to the benefit of any third party. Further, Respondent reserves such rights as it may have to seek and obtain contribution, indemnification, and/or any other form of recovery from its insurers and from other potentially responsible parties or their insurers for past or future response and/or cleanup costs or such other costs or damages arising from the contamination at the Site as may be provided by law, including but not limited to rights of contribution under section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

## IX. Indemnification

Respondent shall indemnify and hold the Department, the State of New York, the Trustee of the State's natural resources, and their representatives and employees harmless as provided by 6 NYCRR 375-2.5(a)(3)(i).

## X. Public Notice

A. Within thirty (30) Days after the effective date of this Order, Respondent shall provide notice as required by 6 NYCRR 375-1.5(a). Within sixty (60) Days of such filing, Respondent shall provide the Department with a copy of such instrument certified by the recording officer to be a true and faithful copy.

B. If Respondent proposes to transfer by sale or lease the whole or any part of Respondent's interest in the Site, or becomes aware of such transfer, Respondent shall, not fewer than forty-five (45) Days before the date of transfer, or within forty-five (45) Days after becoming aware of such conveyance, notify the Department in writing of the identity of the transferee and of the nature and proposed or actual date of the conveyance, and shall notify the transferee in writing, with a copy to the Department, of the applicability of this Order. However, such obligation shall not extend to a conveyance by means of a corporate reorganization or merger or the granting of any rights under any mortgage, deed, trust, assignment, judgment, lien, pledge, security agreement, lease, or any other right accruing to a person not affiliated with Respondent to secure the repayment of money or the performance of a duty or obligation.

## XI. Change of Use

Applicant shall notify the Department at least sixty (60) days in advance of any change of use, as defined in 6 NYCRR 375-2.2(a), which is proposed for the Site, in accordance with the provisions of 6 NYCRR 375-1.11(d). In the event the Department determines that the proposed change of use is prohibited, the Department shall notify Applicant of such determination within forty-five (45) days of receipt of such notice.

## XII. Environmental Easement

A. If a Record of Decision for the Site relies upon one or more institutional and/or engineering controls, Respondent (or the owner of the Site) shall submit to the Department for approval an Environmental Easement to run with the land in favor of the State which complies with the requirements of ECL Article 71, Title 36, and 6 NYCRR 375-1.8(h)(2). Upon acceptance of the Environmental Easement by the State, Respondent shall comply with the requirements of 6 NYCRR 375-1.8(h)(2).

B. If the ROD provides for no action other than implementation of one or more institutional controls, Respondent shall cause an environmental easement to be recorded under the provisions of Subparagraph XII.A.

C. If Respondent does not cause such environmental easement to be recorded in accordance with 6 NYCRR 375-1.8(h)(2), Respondent will not be entitled to the benefits conferred by 6 NYCRR 375-1.9 and 375-2.9 and the Department may file an Environmental Notice on the site.

### XIII. Progress Reports

Respondent shall submit a written progress report of its actions under this Order to the parties identified in Subparagraph IV.A.1 of the Order by the 10th day of each month commencing with the month subsequent to the approval of the first Work Plan and ending with the Termination date as set forth in Paragraph XIV, unless a different frequency is set forth in a Work Plan. Such reports shall, at a minimum, include: all actions relative to the Site during the previous reporting period and those anticipated for the next reporting period; all approved activity modifications (changes of work scope and/or schedule); all results of sampling and tests and all other data received or generated by or on behalf of Respondent in connection with this Site, whether under this Order or otherwise, in the previous reporting period, including quality assurance/quality control information; information regarding percentage of completion; unresolved delays encountered or anticipated that may affect the future schedule and efforts made to mitigate such delays; and information regarding activities undertaken in support of the Citizen Participation Plan during the previous reporting period and those anticipated for the next reporting period.

### XIV. Termination of Order

A. This Order will terminate upon the earlier of the following events:

1. Respondent's election in accordance with Paragraph III.E.2 not to implement the remedial activities required pursuant to the ROD. In the event of termination in accordance with this Subparagraph, this Order shall terminate effective the 5th Day after the Department's receipt of the written notification, provided, however, that if there are one or more Work Plan(s) for which a final report has not been approved at the time of Respondent's notification of its election not to implement the remedial activities in accordance with the ROD, Respondent shall complete the activities required by such previously approved Work Plan(s) consistent with the schedules contained therein. Thereafter, this Order shall terminate effective the 5th Day after the Department's approval of the final report for all previously approved Work Plans; or

2. The Department's written determination that Respondent has completed all phases of the Remedial Program (including Site Management), in which event the termination shall be effective on the 5th Day after the date of the Department's letter stating that all phases of the remedial program have been completed.

B. Notwithstanding the foregoing, the provisions contained in Paragraphs VI and IX shall survive the termination of this Order and any violation of such surviving Paragraphs shall be a violation of this Order, the ECL, and 6 NYCRR 375-2.11(a)(4), subjecting Respondent to penalties as provided under Paragraph IV so long as such obligations accrued on or prior to the Termination Date.

C. If the Order is terminated pursuant to Subparagraph XIV.A.1, neither this Order nor its termination shall affect any liability of Respondent for remediation of the Site and/or for payment of State Costs, including implementation of removal and remedial actions, interest, enforcement, and any and all other response costs as defined under CERCLA, nor shall it affect any defenses to such liability that may be asserted by Respondent. Respondent shall also ensure that it does not leave the Site in a condition, from the perspective of human health and environmental protection, worse than that which existed before any activities under this Order were commenced. Further, the Department's efforts in obtaining and overseeing compliance with this Order shall constitute reasonable efforts under law to obtain a voluntary commitment from Respondent for any further activities to be undertaken as part of a Remedial Program for the Site.

#### XV. Dispute Resolution

A. In the event disputes arise under this Order, Respondent may, within fifteen (15) Days after Respondent knew or should have known of the facts which are the basis of the dispute, initiate dispute resolution in accordance with the provisions of 6 NYCRR 375-1.5(b)(2).

B. All cost incurred by the Department associated with dispute resolution are State costs subject to reimbursement pursuant to this Order.

C. Nothing contained in this Order shall be construed to authorize Respondent to invoke dispute resolution with respect to the remedy selected by the Department in the ROD or any element of such remedy, nor to impair any right of Respondent to seek judicial review of the Department's selection of any remedy.

#### XVI. Miscellaneous

A. Respondent agrees to comply with and be bound by the provisions of 6 NYCRR Subparts 375-1 and 375-2; the provisions of such Subparts that are referenced herein are referenced for clarity and convenience only and the failure of this Order to specifically reference any particular regulatory provision is not intended to imply that such provision is not applicable to activities performed under this Order.

B. The Department may exempt Respondent from the requirement to obtain any state or local permit or other authorization for any activity conducted pursuant to this Order in accordance with 6 NYCRR 375-1.12(b), (c), and (d).

C. 1. Respondent shall use best efforts to obtain all Site access, permits, easements, approvals, institutional controls, and/or authorizations necessary to perform Respondent's obligations under this Order, including all Department-approved Work Plans and the schedules contained therein. If, despite Respondent's best efforts, any access, permits, easements, approvals, institutional controls, or authorizations cannot be obtained, Respondent shall promptly notify the Department and include a summary of the steps taken. The Department may, as it deems appropriate and within its authority, assist Respondent in obtaining same.

2. If an interest in property is needed to implement an institutional control required by a Work Plan and such interest cannot be obtained, the Department may require Respondent to modify the Work Plan pursuant to 6 NYCRR 375-1.6(d)(3) to reflect changes necessitated by Respondent's inability to obtain such interest.

D. The paragraph headings set forth in this Order are included for convenience of reference only and shall be disregarded in the construction and interpretation of any provisions of this Order.



E. 1. The terms of this Order shall constitute the complete and entire agreement between the Department and Respondent concerning the implementation of the activities required by this Order. No term, condition, understanding, or agreement purporting to modify or vary any term of this Order shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department shall be construed as relieving Respondent of Respondent's obligation to obtain such formal approvals as may be required by this Order. In the event of a conflict between the terms of this Order and any Work Plan submitted pursuant to this Order, the terms of this Order shall control over the terms of the Work Plan(s). Respondent consents to and agrees not to contest the authority and jurisdiction of the Department to enter into or enforce this Order.

2. i. Except as set forth herein, if Respondent desires that any provision of this Order be changed, Respondent shall make timely written application to the Commissioner with copies to the parties listed in Subparagraph IV.A.1.

ii. If Respondent seeks to modify an approved Work Plan, a written request shall be made to the Department's project manager, with copies to the parties listed in Subparagraph IV.A.1.

iii. Requests for a change to a time frame set forth in this Order shall be made in writing to the Department's project attorney and project manager; such requests shall not be unreasonably denied and a written response to such requests shall be sent to Respondent promptly.

F. 1. If there are multiple parties signing this Order, the term "Respondent" shall be read in the plural, the obligations of each such party under this Order are joint and several, and the insolvency of or failure by any Respondent to implement any obligations under this Order shall not affect the obligations of the remaining Respondent(s) under this Order.

2. If Respondent is a partnership, the obligations of all general partners (including limited partners who act as general partners) under this Order are joint and several and the insolvency or failure of any general partner to implement any obligations under this Order shall not affect the obligations of the remaining partner(s) under this Order.

3. Notwithstanding the foregoing Subparagraphs XVI.F.1 and 2, if multiple parties sign this Order as Respondents but not all of the signing parties elect to implement a Work Plan, all Respondents are jointly and severally liable for each and every obligation under this Order through the completion of activities in such Work Plan that all such parties consented to; thereafter, only those Respondents electing to perform additional work shall be jointly and severally liable under this Order for the obligations and activities under such additional Work Plan(s). The parties electing not to implement the additional Work Plan(s) shall have no obligations under this Order relative to the activities set forth in such Work Plan(s). Further, only those Respondents electing to implement such additional Work Plan(s) shall be eligible to receive the release and covenant not to sue referenced in Paragraph VII.

G. Respondent shall be entitled to receive contribution protection and/or to seek contribution to the extent authorized by ECL 27-1421(6) and 6 NYCRR 375-1.5(b)(5).

H. Unless otherwise expressly provided herein, terms used in this Order which are defined in ECL Article 27 or in regulations promulgated thereunder shall have the meaning assigned to them under said statute or regulations.

I. Respondent's obligations under this Order represent payment for or reimbursement of response costs, and shall not be deemed to constitute any type of fine or penalty.

J. Respondent and Respondent's successors and assigns shall be bound by this Order. Any change in ownership or corporate status of Respondent shall in no way alter Respondent's responsibilities under this Order.

K. This Order may be executed for the convenience of the parties hereto, individually or in combination, in one or more counterparts, each of which shall be deemed to have the status of an executed original and all of which shall together constitute one and the same.

**APPENDIX B**  
**SITE CONTACT LIST**

**APPENDIX B - SITE CONTACT LIST**

Key contacts for this project are as follows:

<b>Title/Property:</b>	<b>Contact Name, Phone, Email Address:</b>
Site Owner and Remedial Party:	Mr. Albert Shirian Phone: (516) 829-5883 <a href="mailto:albert.shirian@lionsgroupnyc.com">albert.shirian@lionsgroupnyc.com</a>
Remedial Engineer:	Jason Hayes, P.E. Phone: (212) 479-5427 <a href="mailto:jahayes@langan.com">jahayes@langan.com</a>
Project Director:	Ms. Mimi Raygorodetsky Telephone: (212) 479-5400 <a href="mailto:mraygorodetsky@langan.com">mraygorodetsky@langan.com</a>
Project Manager:	Mr. Brian Gochenaur, QEP Phone: (212) 479-5479 <a href="mailto:bgochenaur@langan.com">bgochenaur@langan.com</a>
NYSDEC DER Project Manager:	Shaun Bollers Phone: (718) 459-7801 <a href="mailto:Shaun.bollers@dec.ny.gov">Shaun.bollers@dec.ny.gov</a>
NYSDEC Regional HW Engineer:	Jane O'Connell, P.G. Phone: (718) 482-4599 <a href="mailto:Jane.oconnell@dec.ny.gov">Jane.oconnell@dec.ny.gov</a>
NYSDEC Site Control:	Kelly Lewandowski Phone: (518) 402-9569 <a href="mailto:kelly.lewandowski@dec.ny.gov">kelly.lewandowski@dec.ny.gov</a>
Remedial Party Attorney:	Michael Bogin Phone: (646) 378-7210 <a href="mailto:mbogin@sprlaw.com">mbogin@sprlaw.com</a>
North Adjacent Properties:	
Hyatt Place Long Island City/New York City and parking, 27-03, 27-07, 27-09, 27-10 43rd Avenue, Queens, New York 11101	Phone: (929) 208-3100
East Adjacent Properties:	
Vacant Land and Ed Koch Queensboro Bridge On-ramp and upper roadway (elevated)	N/A

Title/Property	Phone/Email Address
South Adjacent Properties:	
Parking lot, 26-46 Jackson Avenue, Queens, New York 11101  Brownfield Cleanup Program Site No. C241217, 26-32 Jackson Avenue, Queens, New York 11101  Multi-story mixed-use building, 26-26 Jackson Avenue, Queens, New York 11101	N/A
West Adjacent Properties:	
Multi-story industrial building, 26-27 Jackson Avenue, Queens, New York 11101	N/A

Document Repositories:

The document repositories identified below have been established to provide the public with convenient access to important project documents:

Queens Library at Long Island City  
Attn to: Luba Kierkosz  
37-44 21st Street  
Long Island City, NY 11101  
Phone: 718-752-3700

Queens Community Board No. 2  
Morry Galonoy, Chairperson  
43-22 50th Street, Room 2B  
Woodside, New York 11377  
Phone: 718-533-8773

**APPENDIX C**  
**RESPONSIBILITIES OF REMEDIAL PARTY**

## **APPENDIX C – RESPONSIBILITIES OF REMEDIAL PARTY**

### **Responsibilities**

The responsibility for implementing the Site Management Plan (“SMP”) for the **off-site areas subject to Order of Consent (CO) No. S241209 affiliated with Brownfield Cleanup Program (BCP) Site No. 241209**, is the sole responsibility of the Remedial Party, as defined below:

2701 Jackson LLC (the “Participant”)  
425 Northern Boulevard  
Great Neck, NY 11021

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

Nothing on this page shall supersede the provisions of the Order on Consent (CO), Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the site.

### **Remedial Party’s (BCP Participant):**

1. In accordance with a periodic time frame determined by the NYSDEC, the RP shall periodically certify, in writing, that all Institutional Controls (ICs) set forth in the CO remain in place and continue to be complied with.
2. In the event the site is delisted, the RP remains bound by the CO and shall submit, upon request by the NYSDEC, a written certification that the CO is still in place and have been complied with.
3. In the event some action or inaction by the RP adversely impacts the site, the RP must notify the NYSDEC in accordance with the time frame indicated in Section 1.3 - Notifications and (ii) coordinate the performance of necessary corrective actions with the RP.

4. The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the site.
5. The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.
6. Before accessing the site property to undertake a specific activity, the RP shall provide advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the NYSDEC, and (ii) other entities, if required by the SMP, a copy of any data generated during the site visit and/or any final report produced.
7. If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner.
8. The RP shall notify the NYSDEC of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (ECs). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at <http://www.dec.ny.gov/chemical/76250.html>.
9. The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 1.3 - Notifications of the SMP.
10. Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the owner and RP shall submit to the NYSDEC for approval an amended SMP.
11. Any change in use, change in ownership, change in site classification (e.g., delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.



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


Future site Ps and their successors and assigns are required to carry out the activities set forth above.

**APPENDIX D**  
**SITE BORING LOGS**

Project 27-01 Jackson Avenue				Project No. 170472002			
Location Queens, NY				Elevation and Datum			
Drilling Company Aquifer Drilling Testing				Date Started 6/8/20		Date Finished 6/8/20	
Drilling Equipment Geoprobe 7782DT				Completion Depth 24 ft		Rock Depth 24 ft	
Size and Type of Bit 2-inch Direct push				Number of Samples		Disturbed 3	Undisturbed NA
Casing Diameter (in) NA		Casing Depth (ft) NA		Water Level (ft.) First 18		Completion NA	24 HR. NA
Casing Hammer NA		Weight (lbs) NA		Drop (in) NA		Drilling Foreman Rob allegrazza	
Sampler 5-foot Acetate Liner				Field Engineer Jack Donelan			
Sampler Hammer NA		Weight (lbs) NA		Drop (in) NA			

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MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
			Number	Type	Recov. (in)	Penetr. resist	BL/Join		
[Cross-hatched pattern]	R1 Brown to black fine SAND, some clay, trace medium sand, brick, concrete, coal (moist) [FILL]	0					0	Sample collected for TCL/Part 375 VOCs and SVOCs	
		1					0		
		2					0		
		3		R1	Macrocore	36			0.1
		4							0.1
		5							0.1
		6							0.0
		7							0.0
		8		R2	Macrocore	48			0.0
		9							0.0
[Cross-hatched pattern]	R2 Brown to black fine SAND, some clay, trace medium sand, Brick, coal, concrete, (moist)[FILL]	10					0.2		
		11					0.6		
		12					0.3		
		13		R3	Macrocore	48			0.1
		14							0.1
		15							0.0
		16							0.0
		17							0.0
		18							0.0
		19							0.0
[Cross-hatched pattern]	R3 Grey to dark brown fine SAND, some clay, trace fine gravel (moist)[FILL]	20					0.1		
		21					0.1		
		22					0.1		
		23					0.2		
		24					0.2		
		25					0.2		
		26					0.1		
		27					0.1		
		28					0.2		
		29					0.2		
[Cross-hatched pattern]	R4a (0-24") Grey to dark brown fine SAND, some clay, trace fine gravel (moist)[FILL]	30					0.2		
		31					0.1		
		32					0.1		
		33					0.2		
		34					0.2		
		35					0.1		
		36					1.5		
		37					4.2		
		38					8.9		
		39							
[Cross-hatched pattern]	R4b (24-42") Brown to dark brown fine SAND, some clay, trace fine gravel (wet)[SP-SC]	40						Sample collected for TCL/Part 375 VOCs and SVOCs	
		41							
		42		R4	Macrocore	42			
		43							
		44							
		45							
		46							
		47							
		48							
		49							

Project		Project No.					
27-01 Jackson Avenue		170472002					
Location		Elevation and Datum					
Queens, NY							
MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Number	Type	Recov. (in)	Penetr. resist. BL/ft	
	R5 Brown to dark brown fine SAND, some clay, trace gravel (wet)[SP-SC]	20	R5	Macrocore	48		0
		21					0
		22					0.1
		23					0.1
		24					0.2
		25					0
		26					0
		27					
		28					
		29					
		30					
		31					
		32					
		33					
		34					
		35					
		36					
		37					
		38					
		39					
		40					
		41					
		42					
		43					
		44					
		45					

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Sample collected for  
TCL/Part 375 VOCs and  
SVOCs  
End of boring at 24 feet bgs.  
Boring backfilled with clean  
soil cuttings and/or sand to  
grade.

Project 27-01 Jackson Avenue				Project No. 170472002			
Location Queens, NY				Elevation and Datum			
Drilling Company Aquifer Drilling Testing				Date Started 6/8/20		Date Finished 6/8/20	
Drilling Equipment Geoprobe 7782DT				Completion Depth 34 ft		Rock Depth	
Size and Type of Bit 2-inch Direct push				Number of Samples		Disturbed 3	Undisturbed NA
Casing Diameter (in) NA		Casing Depth (ft) NA		Water Level (ft.) First 15		Completion NA	24 HR. NA
Casing Hammer NA		Weight (lbs) NA		Drop (in) NA		Drilling Foreman Rob allegrazza	
Sampler 5-foot Acetate Liner				Field Engineer Jack Donelan			
Sampler Hammer NA		Weight (lbs) NA		Drop (in) NA			

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MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
			Number	Type	Recov. (in)	Penetr. resist	BL/Join		
[Cross-hatched]	R1 Brown to black fine SAND, some clay, brick, coal, coal ash (moist)[FILL]	0					21.0	Sample collected for TCL/Part 375 VOCs and SVOCs	
		1					4.6		
		2	R1	Macrocore	24				1.1
		3							1.0
		4							
[Cross-hatched]	R2 Brown fine SAND, some fine gravel, brick (moist)[FILL]	5							
		6							
		7	R2	Macrocore	12				
		8							
		9							0.1
[Cross-hatched]	R3a Brown fine SAND, some fine gravel, brick (moist)[FILL]	10					0.1		
		11							
		12							
		13	R3	Macrocore	36				4.1
		14							5.5
[Cross-hatched]	R3b Brownish gray to black fine SAND, some clay (wet)[SP-SC]	13					1.3	Sample collected for TCL/Part 375 VOCs and SVOCs	
		14					6.1		
		15					0.9		
		16							
		17	R4	Macrocore	58				575.5
[Cross-hatched]	R4 Brownish gray to black fine SAND, some clay (wet)[SP-SC]	15					1208	Petroleum-like odor	
		16					1129		
		17					597.3		
		18					254.6		
		19					4.8		
		20							

Project 27-01 Jackson Avenue	Project No. 170472002
Location Queens, NY	Elevation and Datum

MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
			Number	Type	Recov. (in)	Penetr. resist. BL/6in		PID Reading (ppm)
	R5 Brownish gray to black fine SAND, some clay (wet)[SP-SC]	20	R5	Macrocore	60		538.9	
	21	46.6						
	22	31.8						
	23	52.6						
	24	43.6						
	25	38.7						
	R8 Dark gray to brown fine SAND, some medium sand, trace clay (wet)[SP-SC]	26	R6	Macrocore	48		19.6	
	27	11.5						
	28	9.6						
	29	71.6						
	30	2.6						
	31	9.9						
	R7 Dark gray to brown fine SAND, some medium sand, trace clay (wet)[SP-SC]	32	R7	Macrocore	18		15.6	
	33	7.2						
	34	2.4						
			35					7.4
			36					1.5
			37					
		38						
		39						
		40						
		41						
		42						
		43						
		44						
		45						

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Sample collected for  
TCL/Part 375 VOCs and  
SVOCs  
End of boring at 34 feet bgs.  
Boring backfilled with clean  
soil cuttings and/or sand to  
grade.

Project 27-01 Jackson Avenue				Project No. 170472002			
Location Queens, NY				Elevation and Datum			
Drilling Company Aquifer Drilling Testing				Date Started 6/9/20		Date Finished 6/9/20	
Drilling Equipment Geoprobe 7782DT				Completion Depth 30 ft		Rock Depth	
Size and Type of Bit 2-inch Direct push				Number of Samples		Disturbed 3	Undisturbed NA
Casing Diameter (in) NA		Casing Depth (ft) NA		Water Level (ft.) First 14.5		Completion NA	24 HR. NA
Casing Hammer NA		Weight (lbs) NA		Drop (in) NA		Drilling Foreman Rob allegrazza	
Sampler 5-foot Acetate Liner				Field Engineer Jack Donelan			
Sampler Hammer NA		Weight (lbs) NA		Drop (in) NA			

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MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
			Number	Type	Recov. (in)	Penetr. resist	BL/Join		
[Cross-hatched pattern]	R1 Brown to black fine SAND, some coarse sand, trace fine gravel, brick, coal (moist)[FILL]	0					0.0	Sample collected for TCL/Part 375 VOCs and SVOCs [DUP01]	
		1					0.0		
		2					0.1		
		3	R1	Macrocore	36				0.0
		4					0.0		
	R2 Brown fine SAND, some medium sand, trace clay (moist)[FILL]	5					0.0		
		6					0.0		
		7	R2	Macrocore	42				0.0
		8					0.0		
		9					4.2		
R3 Brown to black fine SAND, some silt, trace clay (moist)[FILL]	10					4.5			
	11								
	12	R3	Macrocore	42			0.2		
	13					0.5			
	14					0.8			
R4 Dark brown to black fine SAND, some silt, trace clay (wet)[SP-SC]	15					0.6	Sample collected for TCL/Part 375 VOCs and SVOCs [MS/MSD] Petroleum-like odor, sheen visible in pore water		
	16					6.8			
	17					10.2			
	18	R4	Macrocore	42				292.6	
	19					459.7			
	20					1012			

Petroleum-like odor, sheen visible in pore water

Project 27-01 Jackson Avenue	Project No. 170472002
Location Queens, NY	Elevation and Datum

MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
			Number	Type	Recov. (in)	Penetr. resist. BL/6in		PID Reading (ppm)
	R5 Dark brown to black fine SAND, some silt, trace clay (wet)[SP-SC]	20	R5	Macrocore	54			
		21						20.0
		22						31.2
		23						26.5
		24						855.1
		25						860.7
		26						340.6
		27						89.4
		28						21.2
		29						
	R6 Dark brown to black fine SAND, some silt, trace clay (wet)[SP-SC]	30	R6	Macrocore	36			
		31						400.7
		32						397.0
		33						25.4
		34						21.2
		35						26.7
		36						39.7
		37						45.6
		38						
		39						
	40							
	41							
	42							
	43							
	44							
	45							

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Petroleum-like odor

Petroleum-like odor

Sample collected for  
TCL/Part 375 VOCs and  
SVOCs  
End of boring at 30 feet bgs.  
Boring backfilled with clean  
soil cuttings and/or sand to  
grade.



Project 27-01 Jackson Avenue				Project No. 170472002			
Location Queens, NY				Elevation and Datum			
Drilling Company Aquifer Drilling Testing				Date Started 6/8/20		Date Finished 6/8/20	
Drilling Equipment Geoprobe 7782DT				Completion Depth 32 ft		Rock Depth	
Size and Type of Bit 2-inch Direct push				Number of Samples		Disturbed 3	Undisturbed NA
Casing Diameter (in) NA		Casing Depth (ft) NA		Water Level (ft.) First 13		Completion NA	24 HR. NA
Casing Hammer NA		Weight (lbs) NA		Drop (in) NA		Drilling Foreman Rob allegrazza	
Sampler 5-foot Acetate Liner				Field Engineer Jack Donelan			
Sampler Hammer NA		Weight (lbs) NA		Drop (in) NA			

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MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Number	Type	Recov. (in)	Penetr. resist	BL/Join	
[Cross-hatched pattern]	R1 Brown to dark CLAY, some fine sand (moist)[FILL]	0					0.0	Sample collected for TCL/Part 375 VOCs and SVOCs
		1					0.0	
		2					0.0	
		3	R1	Macrocore	30			
		4					0.0	
[Cross-hatched pattern]	R2a (0-24") Brown to dark brown CLAY, some fine sand (moist)[FILL]	5					0.2	Sample collected for TCL/Part 375 VOCs and SVOCs
		6					0.2	
		7	R2	Macrocore	36		0.2	
		8					4.6	
		9					14.7	
[Cross-hatched pattern]	R2b (24-36") Dark brown fine SAND, some clay (moist)[SP-SC]	10					3.5	Sample collected for TCL/Part 375 VOCs and SVOCs
		11					0.3	
		12	R3	Macrocore	48		3.2	
		13					15.8	
		14					4.9	
[Cross-hatched pattern]	R3 Dark brown fine SAND, some clay (wet)[SP-SC]	15					3.1	Petroleum-like odor
		16					0.2	
		17	R4	Macrocore	60		0.3	
		18					15.6	
		19					6.9	
[Cross-hatched pattern]	R4 Dark brown fine SAND, some clay (wet)[SP-SC]	20					5.9	Petroleum-like odor
		21					4.6	
		22					5.6	
		23					25.5	
		24					176.6	
[Cross-hatched pattern]		25					568.3	Increasingly sandy with depth
		26					17.9	
		27						

Project		Project No.					
27-01 Jackson Avenue		170472002					
Location		Elevation and Datum					
Queens, NY							
MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Number	Type	Recov. (in)	Penetr. resist. BL/6in	
	R5 Dark brown fine SAND, some clay (wet)[SP-SC]	20	R5	Macrocore	56		159.2
		21					641.8
		22					87.6
		23					86.3
		24					39.1
		25					7.9
		26					102.6
		27					31.9
		28					25.0
		29					
	R6 Grayish brown fine SAND, some clay, trace medium sand (wet)[SP]	25	R6	Macrocore	55		14.9
		26					6.8
		27					4.5
		28					15.4
		29					32.7
		30					16.5
		31					15.6
		32					55.4
		33					
		34					
	R7 Grayish brown fine SAND, some clay, trace medium sand (wet)[SP]	30	R7	Macrocore	24		5.6
		31					13.7
		32					5.3
		33					21.5
		34					
		35					
		36					
		37					
		38					
		39					
40							
41							
42							
43							
44							
45							

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Sample collected for TCL/Part 375 VOCs and SVOCs  
 End of boring at 24 feet bgs. Boring backfilled with clean soil cuttings and/or sand to grade.

# LANGAN

Project 27-01 Jackson Avenue				Project No. 170472002			
Location Queens, NY				Elevation and Datum			
Drilling Company Aquifer Drilling Testing				Date Started 6/9/20		Date Finished 6/9/20	
Drilling Equipment Geoprobe 7782DT				Completion Depth 30 ft		Rock Depth	
Size and Type of Bit 2-inch Direct push				Number of Samples		Disturbed 4	Undisturbed NA
Casing Diameter (in) NA		Casing Depth (ft) NA		Water Level (ft.) First 13		Completion NA	24 HR. NA
Casing Hammer NA		Weight (lbs) NA	Drop (in) NA	Drilling Foreman Rob allegrazza			
Sampler 5-foot Acetate Liner				Field Engineer Jack Donelan			
Sampler Hammer NA		Weight (lbs) NA	Drop (in) NA				

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MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Number	Type	Recov. (in)	Penetr. resist. BL/Join	PID Reading (ppm)	
[Cross-hatched pattern]	R1 Dark brown to brown fine SAND, some clay, brick, concrete (moist)[FILL]	0					0.0	Sample collected for TCL/Part 375 VOCs and SVOCs
		1					0.0	
		2					0.2	
		3	R1	Macrocore	36		0.1	
		4					0.0	
	R2 Dark brown to brown fine SAND, some clay, brick, concrete, odors (moist)[FILL]	5					0.0	
		6					4.8	
		7	R2	Macrocore	48		5.7	
		8					10.8	
		9					205.7	
R3 Dark brown to brown fine SAND, some clay, brick, concrete (moist)[FILL]	10					485.9	Sample collected for TCL/Part 375 VOCs and SVOCs Staining, petroleum-like odor	
	11					267.5		
	12					6.9		
	13	R3	Macrocore	48		7.5		
	14					11.4		
R4 Dark brown to brown fine SAND, some clay, brick, concrete (moist)[SP-SC]	15					11.6	Sample collected for TCL/Part 375 VOCs and SVOCs	
	16					7.5		
	17					8.9		
	18	R4	Macrocore	42		8.9		
	19					20.0		
	20					2.8		

Project		Project No.					
27-01 Jackson Avenue		170472002					
Location		Elevation and Datum					
Queens, NY							
MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Number	Type	Recov. (in)	Penetr. resist. BL/6in	
	R5 Dark brown to brown fine SAND, some clay, trace coarse sand, brick (moist)[SP-SC]	20	R5	Macrocore	52		
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	R6 Dark brown to brown fine SAND, some clay, trace coarse sand, brick (moist)[SP-SC]	25	R6	Macrocore	48		
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
35							
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Sample collected for  
TCL/Part 375 VOCs and  
SVOCs  
End of boring at 30 feet bgs.  
Boring backfilled with clean  
soil cuttings and/or sand to  
grade.

Project 27-01 Jackson Avenue				Project No. 170472002			
Location Queens, NY				Elevation and Datum			
Drilling Company Aquifer Drilling Testing				Date Started 6/9/20		Date Finished 6/9/20	
Drilling Equipment Geoprobe 7782DT				Completion Depth 30 ft		Rock Depth	
Size and Type of Bit 2-inch Direct push				Number of Samples		Disturbed 3	Undisturbed NA
Casing Diameter (in) NA		Casing Depth (ft) NA		Water Level (ft.) First 14		Completion NA	24 HR. NA
Casing Hammer NA		Weight (lbs) NA		Drop (in) NA		Drilling Foreman Rob allegrazza	
Sampler 5-foot Acetate Liner				Field Engineer Jack Donelan			
Sampler Hammer NA		Weight (lbs) NA		Drop (in) NA			

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MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
			Number	Type	Recov. (in)	Penetr. resist	BL/Join		
[Cross-hatch pattern]	R1 Brown fine SAND, some clay, trace silt, brick, concrete (moist)[FILL]	0						0.1	Sample collected for TCL/Part 375 VOCs and SVOCs
		1						0.2	
		2						0.3	
		3	R1	Macrocore	36			0.0	
		4						0.3	
[Cross-hatch pattern]	R2a (0-24") Brown fine SAND, some clay, trace silt, brick, concrete (moist)[FILL]	5						0.3	
		6						0.6	
		7						0	
		8	R2	Macrocore	36			0	
		9						0	
[Diagonal lines pattern]	R2b (24-36") Brown fine SAND, some clay, trace silt (moist)[SP-SC] R3 Brown fine SAND, some clay, trace silt (moist)[SP-SC]	10						0	
		11						0	
		12						0	
		13	R3	Macrocore	42			0.0	
		14						0.0	
[Diagonal lines pattern]	R4 Brown fine SAND, some clay, trace silt (moist)[SP-SC]	15						0.0	Sample collected for TCL/Part 375 VOCs and SVOCs
		16						0.0	
		17						0.6	
		18	R4	Macrocore	36			0.5	
		19						0.1	
		20						0.1	
								0.0	

Project		Project No.					
27-01 Jackson Avenue		170472002					
Location		Elevation and Datum					
Queens, NY							
MATERIAL SYMBOL	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Number	Type	Recov. (in)	Penetr. resist. BL/6in	
	Brown fine SAND, some clay, trace silt (moist)[SP-SC]	20	R5	Macrocore	60		
		21					
		22					
		23					
		24					
		25					
		26					
		27					
		28					
		29					
	Brown fine SAND, some clay, trace silt (moist)[SP]	25	R6	Macrocore	54		
		26					
		27					
		28					
		29					
		30					
		31					
		32					
		33					
		34					
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Sample collected for  
TCL/Part 375 VOCs and  
SVOCs  
End of boring at 30 feet bgs.  
Boring backfilled with clean  
soil cuttings and/or sand to  
grade.

**APPENDIX E**  
**MONITORING WELL CONSTRUCTION LOGS**

## WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

MW-1

<b>PROJECT</b>		<b>PROJECT NO.</b>																																																																													
27-01 Jackson Avenue		170472002																																																																													
<b>LOCATION</b>		<b>ELEVATION AND DATUM</b>																																																																													
Long Island City, NY		el. N/A NAVD88																																																																													
<b>DRILLING AGENCY</b>		<b>DATE STARTED</b>	<b>DATE FINISHED</b>																																																																												
Aquifer Drilling and Testing, Inc.		10/19/2021	10/19/2021																																																																												
<b>DRILLING EQUIPMENT</b>		<b>DRILLER</b>																																																																													
Geoprobe® 6620 DT		Chris Lodice																																																																													
<b>SIZE AND TYPE OF BIT</b>		<b>INSPECTOR</b>																																																																													
2-inch Direct Push		Andrew Nesci																																																																													
<b>BOREHOLE DIAMETER</b>		<b>TYPE OF WELL (OVERBURDEN / BEDROCK)</b>																																																																													
3 inches		Overburden																																																																													
<b>RISER MATERIAL</b>	<b>DIAMETER</b>	<b>TYPE OF BACKFILL MATERIAL</b>																																																																													
PVC	1-Inch	No. 1 Sand																																																																													
<b>TYPE OF SCREEN</b>	<b>DIAMETER</b>	<b>TYPE OF WELL PACK</b>	<b>TYPE OF SEAL MATERIAL</b>																																																																												
PVC No. 10 Slot	1-inch	No. 1 Sand	Neat Grout																																																																												
<b>METHOD OF INSTALLATION</b>																																																																															
<p>Geoprobe 6620 DT was used to advance 3-inch temporary steel casing to approximately 20 feet bgs. A one-inch (1") PVC monitoring well was installed which consisted of 10' of 10 slot (0.010-inch) well screen, and a solid 1" PVC riser. Well screen was installed from approximately 10 to 20 feet bgs with riser from 10 feet bgs to top of well. Well annulus was backfilled with Filco Superior Quarts Filtration Media (No.1 Sand) to about 1 bgs. Initial PID Headspace reading of 11.4 ppm was observed. Well development took place on 10/19/2021.</p>																																																																															
<b>WELL DEVELOPMENT DATA</b>																																																																															
<b>SURGE BLOCK DIAMETER</b>	N/A	<b>TYPE PUMP</b>	Peristaltic																																																																												
<b>DRILLER OR LANGAN</b>	Driller	<b>MAX PUMP RATE</b>	1 LPM																																																																												
<b>NUMBER OF SURGE CYCLES</b>	N/A	<b>TOTAL VOLUME</b>	5 gal																																																																												
Well developed until purged groundwater was no longer turbid.																																																																															
<b>TOP OF CASING</b>	<b>ELEVATION</b>	<b>HEIGHT (ft)</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">WELL DETAILS</th> <th style="text-align: center;">SUMMARY SOIL CLASSIFICATION</th> <th style="text-align: center;">DEPTH (FT)</th> </tr> <tr> <td style="width: 20%;"></td> <td style="width: 20%;"></td> <td style="width: 40%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td>TOP OF CASING</td> <td>N/A</td> <td></td> <td>0</td> </tr> <tr> <td>TOP OF SLAB</td> <td>N/A</td> <td></td> <td>0</td> </tr> <tr> <td>TOP OF SEAL</td> <td>N/A</td> <td></td> <td>0</td> </tr> <tr> <td>TOP OF FILTER</td> <td>N/A</td> <td></td> <td>0</td> </tr> <tr> <td>TOP OF SCREEN</td> <td>N/A</td> <td></td> <td>10.0</td> </tr> <tr> <td>BOTTOM OF BORING</td> <td>N/A</td> <td></td> <td>20</td> </tr> <tr> <td>SCREEN LENGTH</td> <td></td> <td></td> <td>10</td> </tr> <tr> <td>SLOT SIZE</td> <td>No. 10 Slot; 0.010 Inches</td> <td></td> <td></td> </tr> <tr> <td colspan="4" style="text-align: center;"><b>GROUNDWATER ELEVATIONS</b></td> </tr> <tr> <td>ELEVATION</td> <td>DATE</td> <td>DEPTH TO WATER</td> <td></td> </tr> <tr> <td>N/A</td> <td>10/19/2021</td> <td>16.82 ft</td> <td></td> </tr> <tr> <td>ELEVATION</td> <td>DATE</td> <td>DEPTH TO WATER</td> <td></td> </tr> <tr> <td>ELEVATION</td> <td>DATE</td> <td>DEPTH TO WATER</td> <td></td> </tr> <tr> <td>ELEVATION</td> <td>DATE</td> <td>DEPTH TO WATER</td> <td></td> </tr> <tr> <td>ELEVATION</td> <td>DATE</td> <td>DEPTH TO WATER</td> <td></td> </tr> <tr> <td>ELEVATION</td> <td>DATE</td> <td>DEPTH TO WATER</td> <td></td> </tr> <tr> <td>ELEVATION</td> <td>DATE</td> <td>DEPTH TO WATER</td> <td></td> </tr> </table>	WELL DETAILS		SUMMARY SOIL CLASSIFICATION	DEPTH (FT)					TOP OF CASING	N/A		0	TOP OF SLAB	N/A		0	TOP OF SEAL	N/A		0	TOP OF FILTER	N/A		0	TOP OF SCREEN	N/A		10.0	BOTTOM OF BORING	N/A		20	SCREEN LENGTH			10	SLOT SIZE	No. 10 Slot; 0.010 Inches			<b>GROUNDWATER ELEVATIONS</b>				ELEVATION	DATE	DEPTH TO WATER		N/A	10/19/2021	16.82 ft		ELEVATION	DATE	DEPTH TO WATER		ELEVATION	DATE	DEPTH TO WATER		ELEVATION	DATE	DEPTH TO WATER		ELEVATION	DATE	DEPTH TO WATER		ELEVATION	DATE	DEPTH TO WATER		ELEVATION	DATE	DEPTH TO WATER	
WELL DETAILS		SUMMARY SOIL CLASSIFICATION		DEPTH (FT)																																																																											
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**LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.**  
 21 Penn Plaza, 360 West 31st Street, 8th Floor, New York



## WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

MW-2

<b>PROJECT</b>		<b>PROJECT NO.</b>	
27-01 Jackson Avenue		170472002	
<b>LOCATION</b>		<b>ELEVATION AND DATUM</b>	
Long Island City, NY		el. N/A NAVD88	
<b>DRILLING AGENCY</b>		<b>DATE STARTED</b>	<b>DATE FINISHED</b>
Aquifer Drilling and Testing, Inc.		10/19/2021	10/19/2021
<b>DRILLING EQUIPMENT</b>		<b>DRILLER</b>	
Geoprobe® 6620 DT		Chris Lodice	
<b>SIZE AND TYPE OF BIT</b>		<b>INSPECTOR</b>	
2-inch Direct Push		Andrew Nesci	
<b>BOREHOLE DIAMETER</b>		<b>TYPE OF WELL (OVERBURDEN / BEDROCK)</b>	
3 inches		Overburden	
<b>RISER MATERIAL</b>	<b>DIAMETER</b>	<b>TYPE OF BACKFILL MATERIAL</b>	
PVC	1-Inch	No. 1 Sand	
<b>TYPE OF SCREEN</b>	<b>DIAMETER</b>	<b>TYPE OF WELL PACK</b>	<b>TYPE OF SEAL MATERIAL</b>
PVC No. 10 Slot	1-inch	No. 1 Sand	Neat Grout
<b>METHOD OF INSTALLATION</b>			
<p>Geoprobe 6620 DT was used to advance 3-inch temporary steel casing to approximately 20 feet bgs. A one-inch (1") PVC monitoring well was installed which consisted of 10' of 10 slot (0.010-inch) well screen, and a solid 1" PVC riser. Well screen was installed from approximately 10 to 20 feet bgs with riser from 10 feet bgs to top of well. Well annulus was backfilled with Filco Superior Quarts Filtration Media (No.1 Sand) to about 1 bgs. Initial PID Headspace reading of 958 ppm was observed. Well development took place on 10/19/2021.</p>			
<b>WELL DEVELOPMENT DATA</b>			
<b>SURGE BLOCK DIAMETER</b>	N/A	<b>TYPE PUMP</b>	Peristaltic
<b>DRILLER OR LANGAN</b>	Driller	<b>MAX PUMP RATE</b>	1 LPM
<b>NUMBER OF SURGE CYCLES</b>	N/A	<b>TOTAL VOLUME</b>	5 gal
<b>DEVELOPMENT CONFIRMATION</b>	Well developed until purged groundwater was no longer turbid.		
<b>TOP OF CASING</b>	<b>ELEVATION</b>	<b>HEIGHT (ft)</b>	<p>The diagram shows a vertical well casing. At the top is the 'Stickup' (ground surface). Below it is the 'Riser'. A 'Seal' is located at the 'Grade Surface' (10 feet depth). Below the seal is the 'PVC Screen' (10 feet length, from 10 to 20 feet depth). The 'Grade Surface' is at 10 feet depth. The 'Seal' is at 0 feet depth. The 'PVC Screen' is from 10 to 20 feet depth. The 'Stickup' is at 0 feet depth. The 'Riser' is from 0 to 10 feet depth. The 'Seal' is at 10 feet depth. The 'PVC Screen' is from 10 to 20 feet depth. The 'Grade Surface' is at 10 feet depth. The 'Seal' is at 0 feet depth. The 'PVC Screen' is from 10 to 20 feet depth.</p>
<b>TOP OF SLAB</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	N/A	0	
<b>TOP OF SEAL</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	N/A	0	
<b>TOP OF FILTER</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	N/A	0	
<b>TOP OF SCREEN</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	N/A	10.0	
<b>BOTTOM OF BORING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	N/A	20	
<b>SCREEN LENGTH</b>		10	
<b>SLOT SIZE</b>	No. 10 Slot; 0.010 Inches		0
			0
			10
<b>GROUNDWATER ELEVATIONS</b>			
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
N/A	10/19/2021	14.41 ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
			20
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.</b>			
21 Penn Plaza, 360 West 31st Street, 8th Floor, New York			

## WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

MW-1

<b>PROJECT</b>		<b>PROJECT NO.</b>	
27-01 Jackson Avenue		170472002	
<b>LOCATION</b>		<b>ELEVATION AND DATUM</b>	
27-01 Jackson Avenue		el. 12.47      NAVD88	
<b>DRILLING AGENCY</b>		<b>DATE STARTED</b>	<b>DATE FINISHED</b>
Aquifer Drilling and Testing, Inc.		10/14/2022	10/14/2022
<b>DRILLING EQUIPMENT</b>		<b>DRILLER</b>	
Geoprobe® 7822 DT		Anthony Palomeque	
<b>SIZE AND TYPE OF BIT</b>		<b>INSPECTOR</b>	
4-inch Direct Push		Seyena Simpson	
<b>BOREHOLE DIAMETER</b>		<b>TYPE OF WELL (OVERBURDEN / BEDROCK)</b>	
4-Inch		Overburden	
<b>RISER MATERIAL</b>	<b>DIAMETER</b>	<b>TYPE OF BACKFILL MATERIAL</b>	
PVC	2-Inch	No. 2 Sand	
<b>TYPE OF SCREEN</b>	<b>DIAMETER</b>	<b>TYPE OF WELL PACK</b>	<b>TYPE OF SEAL MATERIAL</b>
PVC No. 20 Slot	2-Inch	No. 2 Sand	Bentonite
<b>METHOD OF INSTALLATION</b>			
<p>Geoprobe 7822 DT was used to advance the boring to approximately 19 feet below grade surface (bgs). A two-inch (2") PVC monitoring well was installed which consisted of 10 feet of 20 slot (0.020-inch) well screen, and a solid 2" PVC riser. Well screen was installed from approximately 9 to 19 feet bgs with riser from 9 feet bgs to top of well. Well annulus was backfilled with No. 2 sand to about 7 feet bgs followed by 3 feet of bentonite then clean soil cuttings to grade. The well was finished with a manhole cover and concrete pad. Initial PID headspace reading of 109.5 ppm was observed. Well development took place on 10/14/2022.</p>			
<b>WELL DEVELOPMENT DATA</b>			
<b>SURGE BLOCK DIAMETER</b>	N/A	<b>TYPE PUMP</b>	Peristaltic
<b>DRILLER OR LANGAN</b>	Langan	<b>MAX PUMP RATE</b>	N/A
<b>NUMBER OF SURGE CYCLES</b>	N/A	<b>TOTAL VOLUME</b>	0.1 Gal
<b>DEVELOPMENT CONFIRMATION</b>			
Well developed until three well volumes of purged groundwater was achieved.			
<b>TOP OF CASING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	12.47	0	
<b>TOP OF SEAL</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	8.47	4	
<b>TOP OF FILTER</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	5.47	7	
<b>TOP OF SCREEN</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	3	9	
<b>BOTTOM OF BORING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-6.53	19	
<b>SCREEN LENGTH</b>		10	
<b>SLOT SIZE</b>	No. 20 Slot; 0.020 Inches		
<b>GROUNDWATER ELEVATIONS</b>			
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
-5.76	10/14/2022	18.23 ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
		ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
			19
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.</b>			
21 Penn Plaza, 360 West 31st Street, 8th Floor, New York			

## WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

MW-2

<b>PROJECT</b>		<b>PROJECT NO.</b>	
27-01 Jackson Avenue		170472002	
<b>LOCATION</b>		<b>ELEVATION AND DATUM</b>	
27-01 Jackson Avenue		el. 12.24 NAVD88	
<b>DRILLING AGENCY</b>		<b>DATE STARTED</b>	<b>DATE FINISHED</b>
Aquifer Drilling and Testing, Inc.		10/13/2022	10/14/2022
<b>DRILLING EQUIPMENT</b>		<b>DRILLER</b>	
Geoprobe® 7822 DT		Anthony Palomeque	
<b>SIZE AND TYPE OF BIT</b>		<b>INSPECTOR</b>	
2-inch Direct Push		Seyena Simpson	
<b>BOREHOLE DIAMETER</b>		<b>TYPE OF WELL (OVERBURDEN / BEDROCK)</b>	
3-Inch		Overburden	
<b>RISER MATERIAL</b>	<b>DIAMETER</b>	<b>TYPE OF BACKFILL MATERIAL</b>	
PVC	1-Inch	No. 2 Sand	
<b>TYPE OF SCREEN</b>	<b>DIAMETER</b>	<b>TYPE OF WELL PACK</b>	<b>TYPE OF SEAL MATERIAL</b>
PVC No. 20 Slot	1-Inch	No. 2 Sand	Neat Grout
<b>METHOD OF INSTALLATION</b>			
<p>Geoprobe 7822 DT was used to advance 3-inch temporary steel casing to approximately 20 feet below grade surface (bgs). A one-inch (1") PVC monitoring well was installed which consisted of 10 feet of 20 slot (0.020-inch) well screen, and a solid 1" PVC riser. Well screen was installed from approximately 10 to 20 feet bgs with riser from 10 feet bgs to top of well. Well annulus was backfilled with No.2 Sand and clean cuttings to about 1 ft bgs followed by neat grout to grade. The well was finished with a manhole cover and concrete pad. Initial PID Headspace reading of 231.1 ppm was observed. Well development took place on 10/14/2022.</p>			
<b>WELL DEVELOPMENT DATA</b>			
<b>SURGE BLOCK DIAMETER</b>	N/A	<b>TYPE PUMP</b>	Peristaltic
<b>DRILLER OR LANGAN</b>	Driller	<b>MAX PUMP RATE</b>	N/A
<b>NUMBER OF SURGE CYCLES</b>	N/A	<b>TOTAL VOLUME</b>	7.5 Gal
<b>DEVELOPMENT CONFIRMATION</b>			
Well developed until three well volumes of purged groundwater was achieved.			
<b>TOP OF CASING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	12.24	0	
<b>TOP OF SEAL</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	12.24	0	
<b>TOP OF FILTER</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	11.24	1	
<b>TOP OF SCREEN</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	2.24	10	
<b>BOTTOM OF BORING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-7.76	20	
<b>SCREEN LENGTH</b>		10	0
<b>SLOT SIZE</b>	No. 20 Slot; 0.020 Inches		1
<b>GROUNDWATER ELEVATIONS</b>			
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
-2.06	10/14/2022	14.30 ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
		ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
			20
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.</b>			
21 Penn Plaza, 360 West 31st Street, 8th Floor, New York			

## WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

MW-3

<b>PROJECT</b>		<b>PROJECT NO.</b>	
27-01 Jackson Avenue		170472002	
<b>LOCATION</b>		<b>ELEVATION AND DATUM</b>	
27-01 Jackson Avenue		el. 12.55 NAVD88	
<b>DRILLING AGENCY</b>		<b>DATE STARTED</b>	<b>DATE FINISHED</b>
Aquifer Drilling and Testing, Inc.		8/22/2022	8/22/2022
<b>DRILLING EQUIPMENT</b>		<b>DRILLER</b>	
Geoprobe® 7822 DT		Rob Allegrezza	
<b>SIZE AND TYPE OF BIT</b>		<b>INSPECTOR</b>	
4-inch Direct Push		Roswell Lo	
<b>BOREHOLE DIAMETER</b>		<b>TYPE OF WELL (OVERBURDEN / BEDROCK)</b>	
4-Inch		Overburden	
<b>RISER MATERIAL</b>	<b>DIAMETER</b>	<b>TYPE OF BACKFILL MATERIAL</b>	
PVC	2-Inch	No. 2 Sand	
<b>TYPE OF SCREEN</b>	<b>DIAMETER</b>	<b>TYPE OF WELL PACK</b>	<b>TYPE OF SEAL MATERIAL</b>
PVC No. 20 Slot	2-Inch	No. 2 Sand	Bentonite
<b>METHOD OF INSTALLATION</b>			
<p>Geoprobe 7822 DT was used to advance the boring to approximately 24 feet bgs. A two-inch (2") PVC monitoring well was installed which consisted of 10 feet of 20 slot (0.020-inch) well screen, and a solid 2" PVC riser. Well screen was installed from approximately 14 to 24 feet bgs with riser from 14 feet bgs to top of well. Well annulus was backfilled with No. 2 sand to 12 feet bgs followed by bentonite slurry to grade. The well was finished with a flush mounted road box and concrete pad. Initial PID headspace reading of 0.0 ppm was observed. Well development took place on 8/22/2022.</p>			
<b>WELL DEVELOPMENT DATA</b>			
<b>SURGE BLOCK DIAMETER</b>	N/A	<b>TYPE PUMP</b>	Submersible
<b>DRILLER OR LANGAN</b>	Langan	<b>MAX PUMP RATE</b>	1 LPM
<b>NUMBER OF SURGE CYCLES</b>	N/A	<b>TOTAL VOLUME</b>	20 Gal
Well developed until purged groundwater was no longer turbid.			
<b>TOP OF CASING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	12.55	0	
<b>TOP OF SEAL</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-0.45	13	
<b>TOP OF FILTER</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	12.55	0	
<b>TOP OF SCREEN</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-1	14	
<b>BOTTOM OF BORING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-11.45	24	
<b>SCREEN LENGTH</b>		10	
<b>SLOT SIZE</b>	No. 20 Slot; 0.020 Inches		
		13	
		0	
		14	
		24	
<b>GROUNDWATER ELEVATIONS</b>			
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
-4.45	8/22/2022	17.00 ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
		ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.</b>			
21 Penn Plaza, 360 West 31st Street, 8th Floor, New York			

## WELL CONSTRUCTION AND DEVELOPMENT SUMMARY

Well No.

MW-4

<b>PROJECT</b>		<b>PROJECT NO.</b>	
27-01 Jackson Avenue		170472002	
<b>LOCATION</b>		<b>ELEVATION AND DATUM</b>	
27-01 Jackson Avenue		el. 12.69 NAVD88	
<b>DRILLING AGENCY</b>		<b>DATE STARTED</b>	<b>DATE FINISHED</b>
Aquifer Drilling and Testing, Inc.		8/22/2022	8/22/2022
<b>DRILLING EQUIPMENT</b>		<b>DRILLER</b>	
Geoprobe® 7822 DT		Rob Allegrezza	
<b>SIZE AND TYPE OF BIT</b>		<b>INSPECTOR</b>	
4-inch Direct Push		Roswell Lo	
<b>BOREHOLE DIAMETER</b>		<b>TYPE OF WELL (OVERBURDEN / BEDROCK)</b>	
4-Inch		Overburden	
<b>RISER MATERIAL</b>	<b>DIAMETER</b>	<b>TYPE OF BACKFILL MATERIAL</b>	
PVC	2-Inch	No. 2 Sand	
<b>TYPE OF SCREEN</b>	<b>DIAMETER</b>	<b>TYPE OF WELL PACK</b>	<b>TYPE OF SEAL MATERIAL</b>
PVC No. 20 Slot	2-Inch	No. 2 Sand	Bentonite
<b>METHOD OF INSTALLATION</b>			
<p>Geoprobe 7822 DT was used to advance the boring to approximately 23.5 feet bgs. A two-inch (2") PVC monitoring well was installed which consisted of 10 feet of 20 slot (0.020-inch) well screen, and a solid 2" PVC riser. Well screen was installed from approximately 13.5 to 23.5 feet bgs with riser from 13.5 feet bgs to top of well. Well annulus was backfilled with No. 2 sand to 12 feet bgs followed by bentonite slurry to grade. The well was finished with a flush mounted road box and concrete pad. Initial PID headspace reading of 0.0 ppm was observed. Well development took place on 8/22/2022.</p>			
<b>WELL DEVELOPMENT DATA</b>			
<b>SURGE BLOCK DIAMETER</b>	N/A	<b>TYPE PUMP</b>	Submersible
<b>DRILLER OR LANGAN</b>	Langan	<b>MAX PUMP RATE</b>	1 LPM
<b>NUMBER OF SURGE CYCLES</b>	N/A	<b>TOTAL VOLUME</b>	20 Gal
DEVELOPMENT CONFIRMATION			
Well developed until purged groundwater was no longer turbid.			
<b>TOP OF CASING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	12.69	0	
<b>TOP OF SEAL</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-0.31	13	
<b>TOP OF FILTER</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	12.69	0	
<b>TOP OF SCREEN</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-1.31	14	
<b>BOTTOM OF BORING</b>	<b>ELEVATION</b>	<b>DEPTH (ft)</b>	
	-11.31	24	
<b>SCREEN LENGTH</b>		10	13
<b>SLOT SIZE</b>	No. 20 Slot; 0.020 Inches		0
<b>GROUNDWATER ELEVATIONS</b>			
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	14
-3.71	8/22/2022	16.40 ft	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	24
<b>ELEVATION</b>	<b>DATE</b>	<b>DEPTH TO WATER</b>	
<b>LANGAN Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.</b> 21 Penn Plaza, 360 West 31st Street, 8th Floor, New York			

**APPENDIX F**  
**DEWATERING DOCUMENTATION**

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

Division of Environmental Remediation, Region 2  
47-40 21st Street, Long Island City, NY 11101  
P: (718) 482-4995  
www.dec.ny.gov

**PERMIT EQUIVALENT**  
**Under the Environmental Conservation Law (ECL)**

**Facility Information**

**Permit Equivalent Issued to:**

2701 Property Owner LLC  
425 Northern Boulevard, Suite #6  
Great Neck, NY 11201

**Facility Name / Site Code:**

27-01 Jackson Avenue / C241209

**Location:**

27-01 Jackson Avenue  
Long Island City, NY 11101

**Facility Principal Reference Point:**

Latitude: 40°44' 52.32"      Longitude: -73° 56' 28.09"

**Authorized Activity:** Install and operate a temporary dewatering system consists of 5 dewatering well points to facilitate remedial excavation at 27-01 Jackson Avenue, Queens, NY 11101 with a maximum withdrawal rate of 100,000 gallons per day. Pumped groundwater is to be treated by a settling tank, a filter unit fitted with 10-micron filter bags, and two granular activated carbon (GAC) vessels before discharging to the 42" combined sewer on 43<sup>rd</sup> Avenue. The final point of discharge of this sewer is Bowery Bay WPCP. The Permittee obtained conditional approval from NYCDEP Bureau of Wastewater Treatment on March 1, 2021 for discharging into the combined sewer.

**Long Island Well - Under Article 15, Title 15**

**Permit Equivalent Authorizations**

Permit Equivalent ID:      BCP Site # C241209

Permit Equivalent Effective Date: 09/16/2021      Expiration Date: 09/30/2022

**NYSDEC Approval**

**By acceptance of this Permit Equivalent, the Permittee agrees that the Permit Equivalent is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this Permit Equivalent.**

Permit Equivalent Administrator: Jane O' Connell, P.G., Regional Hazardous Waste Remediation Engineer

Authorized Signature: *Jane H. O'Connell*      Date 09/16/21



## Permit Equivalent Components

LONG ISLAND WELL PERMIT EQUIVALENTS SPECIAL CONDITIONS APPLY TO THIS  
AUTHORIZED PERMIT EQUIVALENT

### LONG ISLAND WELL PERMIT EQUIVALENT CONDITIONS

1. **Conformance with Plans** All activities authorized by the Brownfield Cleanup Agreement for this Permit Equivalent must be in strict conformance with the approved plans submitted by the Permittee or Permittee's agent as part of the Permit Equivalent application. Such approval plans were prepared by Tenen Environmental, LLC for 2701 Property Owner LLC.
2. **Conformance with Plans - Addenda** In addition to plans referenced in the Condition titled "Conformance with Plans," the activities authorized by this Permit Equivalent must be in strict conformance with the following approved plans and/or submissions made as part of the Permit Equivalent application:
  - A. Long Island Well Permit Equivalent Application Package dated July 12, 2021;
  - B. Region 2 Long Island Well Dewatering System Detail Sheet, signed by Matthew M. Carroll P.E. dated September 8, 2020; and
  - C. DEC approved Remedial Action Work plan dated January 2021; and
  - D. DEC approved Remedial Design report dated January 23, 2020.
3. **Daily Pump Log:** A daily pump log in gallons per day (GPD) must be kept at the project site at all times. The pump log must be made available to authorized representatives of the DEC during pumping operations.
4. **Handling of Contaminated Groundwater:** The Permittee is fully responsible for proper handling and all costs associated with the proper sampling, treatment and disposal of any contaminated groundwater.
5. **Well Driller Registration:** The dewatering operation shall be performed by well drillers duly registered in accordance with Section 15-1525 of the Environmental Conservation Law of the State of New York.
6. **Notice of Intent to Commence Work:** At least five (5) days prior to commencement of the authorized activity, Permittee must complete and submit the attached "Notice of Intent to Commence Work" to NYSDEC Division of Environmental Remediation, 47-40 21st Street, Long Island City, NY 11101 (Attention: Shaun Bollers).

### GENERAL CONDITIONS - Apply to ALL Authorized Permit Equivalents:

1. **Facility Inspection by The Department:** The Brownfield Cleanup Program site or facility, including relevant records, is subject to inspection at reasonable hours and intervals



by an authorized representative of the Department of Environmental Conservation ("DEC") to determine whether the Permittee is complying with this Permit Equivalent and the ECL. Such representative may order the work suspended pursuant to ECL 71- 0301 and SAPA 401(3).

The Permittee shall provide a person to accompany the DEC's representative during an inspection to the Permit Equivalent area when requested by the DEC.

A copy of this Permit Equivalent, including all referenced maps, drawings and special conditions, must be available for inspection by the DEC at all times at the project site or facility. Failure to produce a copy of the Permit Equivalent upon request by a DEC representative is a violation of this Permit Equivalent.

## **2. Relationship of this Permit Equivalent to Other Department Orders and Determinations**

Unless expressly provided for by the DEC, issuance of this Permit Equivalent does not modify, supersede or rescind any order or determination previously issued by the DEC or any of the terms, conditions or requirements contained in such order or determination.

**3. Applications For Permit Equivalent Renewals, Modifications or Transfers** The Permittee must submit a separate written application to the DEC for Permit Equivalent renewal, modification or transfer of this Permit Equivalent. Such application must include any forms or supplemental information the DEC requires. Any renewal, modification or transfer granted by the DEC must be in writing. Submission of applications for Permit Equivalent renewal, modification or transfer are to be submitted to:

Jane O' Connell, P.G., Regional Remediation Engineer  
NYSDEC REGION 2 HEADQUARTERS  
47-40 21ST ST  
LONG ISLAND CITY, NY11101 -5407

**4. Submission of Renewal Application** The applicant must submit a renewal application at least 30 days before Permit Equivalent expiration for the following Permit Equivalent authorizations: Long Island Well.

**5. Permit Equivalent Modifications, Suspensions and Revocations by the Department** The DEC reserves the right to modify, suspend or revoke this Permit Equivalent. The grounds for modification, suspension or revocation include:

- a. materially false or inaccurate statements in the Permit Equivalent application or supporting papers;
- b. failure by the Permittee to comply with any terms or conditions of the Permit Equivalent;
- c. exceeding the scope of the project as described in the Permit Equivalent application;
- d. newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing Permit Equivalent;
- e. noncompliance with previously issued Permit Equivalent conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the DEC related to the permitted activity.

**6. Permit Equivalent Transfer** Permit Equivalents are transferrable unless specifically prohibited by statute, regulation or another Permit Equivalent condition. Applications for Permit Equivalent transfer should be submitted prior to actual transfer of ownership.

<b>NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS</b>
--

**Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification**

The Permittee, excepting state or federal agencies, expressly agrees to indemnify and hold harmless the DEC for all claims, suits, actions, and damages, to the extent attributable to the Permittee's acts or omissions in connection with the Permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the Permit Equivalent whether in compliance or not in compliance with the terms and conditions of the Permit Equivalent. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under Article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

**Item B: Permittee's Contractors to Comply with Permit Equivalent**

The Permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this Permit Equivalent, including all special conditions while acting as the Permittee's agent with respect to the authorized activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the Permittee.

**Item C: Permittee Responsible for Obtaining Other Required Permit Equivalents**

The Permittee is responsible for obtaining any other Permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this Permit Equivalent.

**Item D: No Right to Trespass or Interfere with Riparian Rights**

This Permit Equivalent does not convey to the Permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the authorized work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the Permit Equivalent.

**NOTICE OF INTENT TO COMMENCE WORK**

Date: \_\_\_\_\_

Shaun Bollers  
NYSDEC Region 2 Office  
Division of Environmental Remediation  
47-40 21st Street  
Long Island City, N.Y. 11101

Re: LI Well Permit Equivalent Site Code - C241209  
27-01 Jackson Avenue, Remedial Action Excavation Dewatering  
27-01 Jackson Avenue, Long Island City, NY 11101

Dear Mr. Bollers:

In accordance with Special Condition 6 of the referenced permit equivalent, I hereby serve notice to commence work on \_\_\_\_\_, 20\_\_\_\_.

This is also to certify that, having read the entire permit equivalent, I am fully aware of and understand the Long Island Well special and general conditions therein, and agree to comply with all such conditions. Further, I understand that prior to undertaking any modification to the authorized work, I must seek a permit equivalent modification from the NYSDEC Region 2 Office.

\_\_\_\_\_  
Signature of Permittee

\_\_\_\_\_  
Signature of Contractor

\_\_\_\_\_  
Name of Permittee (please print)

\_\_\_\_\_  
Name of Contractor (please print)

\_\_\_\_\_  
Street Address of Contractor

\_\_\_\_\_  
City, State, & Zip Code of Contractor

\_\_\_\_\_  
Telephone Number of Contractor

**WARNING**

**The Permittee and their contractor(s) (if any) are required to follow all permit equivalent conditions. Violations of the permit equivalent may lead to legal action, including the imposition of substantial monetary fines and corrective work.**

**Permit Type:** DEWATERING PERMIT **Permit No:** C001402156

**Customer's Name:** TENEN ENVIRONMENTAL **Phone Number:**  
**Customer's Service Account Number:** 1001053370001  
**Address:**

**Customer's Mailing Address:** 121 WEST 27TH STREET  
NEW YORK, NY 10001

**Issued By:** LJ **Issue Date:** 04/13/2022  
**Permitted Activity:** 722,400 gallons of discharge **Expiration Date:** 06/30/2022  
(03/01/2022 thru 06/30/2022) @ **Fee:** \$6,287.19  
\$6.51 per hundred cubic feet -  
\$6,287.19 Permit Fee

**Permittee:** TENEN ENVIRONMENTAL  
**Dewatering Location:** SC-1127 C-7398, 27-01 Jackson Ave, Queens  
**BBL:**

**Additional Requirements:**

1. If the approval is revoked, the permit is no longer valid.

DEP PERMIT QUEENS OFFICE  
2022 APR 14 A 9:35



March 1, 2022

StructureTech New York, Inc.  
500 Seventh Avenue, Floor 10B  
New York, NY 10018

**Attn: Daniel Chan**

**Rohit Aggarwala**  
Commissioner &  
NYC Chief Climate Officer

**Re: Groundwater Discharge, 27-01 Jackson Avenue, Queens, Letter of Approval No. 22-C-7398-1**

**Pam Elardo, P.E.**  
Deputy Commissioner

Dear Daniel Chan:

**Bureau of Wastewater Treatment**

This Letter of Approval is a renewal of the Letter of Approval issued on March 1, 2021.

96-05 Horace Harding  
Expressway – 2<sup>nd</sup> Floor  
Corona, NY 11368

This is in response to the February 1 and 24, 2022 submissions requesting permission to discharge up to **252,000 gallons per day (gpd)** of groundwater generated during the construction of a 24-story residential/commercial building located at 27-01 Jackson Avenue, Queens, NY 11101 (New York State Department of Environmental Conservation Brownfield Cleanup Program Site Code C241209). The groundwater will be treated through one 6,400 gallon settling tank, one duplex bag filter system, and two 5,000 lb carbon units, per provided schematic and information, before discharging to a proposed sewer connection. The sewer connection leads to the existing 42” combined sewer located at 43<sup>rd</sup> Avenue between Jackson Avenue and Hunter Street in Queens, NY.

Based upon the information, schematic and analytical data submitted, the property owner 2701 Property Owner LLC and agents of the property owner who are authorized to act on the property owner’s behalf in this matter (hereinafter referred to as “the owner and its authorized agents”) are hereby conditionally authorized, to discharge up to 252,000 gpd of the groundwater, treated through the above system, per provided schematic and information, as specified in your submissions, **for a total of 180 days**, to the combined sewer at the above mentioned location. **This Letter of Approval shall expire at midnight on February 28, 2023.**

**The owner and its authorized agents are prohibited from discharging any groundwater during wet weather events.**

This conditional approval, however, is subject to your obtaining a groundwater discharge Approval, specifying allowable flow rates, from the Chief of Permitting and Compliance, Bureau of Water and Sewer Operations. The owner and its authorized agents are required to follow manufacturer specifications for the operation and maintenance of the selected equipment. **This Letter of Approval is contingent upon compliance on the part of the owner and its**

**authorized agents with any federal, state, or local requirements applicable to the permitted activity.**

**Under no circumstances shall muddy groundwater be discharged into the public sewer.**

Payment shall be made to and permit obtained from the Bureau of Customer Service for groundwater discharge into the New York City Wastewater System in accordance with the Water and Wastewater Rate Schedule established by the New York City Water Board.

**The owner or its authorized agents must install a flow meter to measure the flow of groundwater to the combined sewer.**

**The owner or its authorized agents must maintain a logbook of the groundwater discharge flow meter for each day of discharge. The logbook must include at a minimum: the date, time, flow meter reading (units in either cubic feet or gallons), difference from previous day's reading (units in either cubic feet or gallons), and employee's signature or initials. The logbook must be available to DEP personnel for review upon request.**

The owner or its authorized agents must notify this section in writing prior to the commencement of discharge. Please refer to file No. C-7398 in any correspondence to this office.

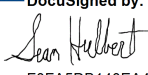
**The owner or its authorized agents must collect samples of the groundwater after the pretreatment system *in each quarter of the calendar year*. The samples must be analyzed for the parameter(s) included in the attached chart by a New York State Department of Health certified laboratory. The results must be submitted to this office within 21 days after each sampling date. If the sampling results, or any other sampling results, exceed the DEP limits, the discharge must cease and the Bureau of Wastewater Treatment must be notified immediately by phone at (718) 595-4715 and by email at [shulbert@dep.nyc.gov](mailto:shulbert@dep.nyc.gov).**

**The owner and its authorized agents are prohibited from discharging any groundwater that exceeds the attached discharge limit(s), as well as those contained in Title 15 Rules of the City of New York Chapter 19.**

This Letter of Approval is an Order of the Commissioner of the Department of Environmental Protection, and applies to the owner and its authorized agents. Please be advised that failure to comply with this Letter of Approval by the owner and its authorized agents may result in the issuance of summonses to either the owner or its authorized agents, or both (returnable to the New York City Office of Administrative Trials and Hearings) and/or revocation of the Letter of Approval. Summonses carry penalties of up to \$10,000 a day, per violation.

If you have any questions concerning this matter, please contact me at (718) 595-4715.

Sincerely,

DocuSigned by:  
  
F0FA5DB140EA4BB...

**Sean H. Hulbert, P.E., Acting  
Chief, Industrial Resource  
Management and Permitting  
Section**

### SAMPLING REQUIREMENTS AND LIMITATIONS

Parameter <sup>1</sup>	Daily Limit	Units	Sample Type	Monthly Limit
Non-polar material <sup>2</sup>	50	mg/l	Instantaneous	---
pH	5-12	SU's	Instantaneous	---
Temperature	< 150	Degree F	Instantaneous	---
Flash Point	> 140	Degree F	Instantaneous	---
Cadmium	2 0.69	mg/l mg/l	Instantaneous Composite	---
Chromium (VI)	5	mg/l	Instantaneous	---
Copper	5	mg/l	Instantaneous	---
Lead	2	mg/l	Instantaneous	---
Mercury	0.05	mg/l	Instantaneous	---
Nickel	3	mg/l	Instantaneous	---
Zinc	5	mg/l	Instantaneous	---
Benzene	134	ppb	Instantaneous	57
Carbontetrachloride	---	---	Composite	---
Chloroform	---	---	Composite	---
1,4 Dichlorobenzene	---	---	Composite	---
Ethylbenzene	380	ppb	Instantaneous	142
MTBE (Methyl-Tert-Butyl-Ether)	50	ppb	Instantaneous	---
Naphthalene	47	ppb	Composite	19
Phenol	---	---	Composite	---
Tetrachloroethylene (Perc)	20	ppb	Instantaneous	---
Toluene	74	ppb	Instantaneous	28
1,2,4 Trichlorobenzene	---	---	Composite	---
1,1,1 Trichloroethane	---	---	Composite	---
Xylenes (Total)	74	ppb	Instantaneous	28
PCB's (Total) <sup>3</sup>	1	ppb	Composite	---
Total Suspended Solids (TSS)	350	mg/l	Instantaneous	---
CBOD	---	---	Composite	---
Chloride	---	---	Instantaneous	---
Total Nitrogen <sup>4</sup>	---	---	Composite	---
Total Solids	---	---	Instantaneous	---
Other				

- 1 All handling and preservation of collected samples and laboratory analyses of samples shall be performed in accordance with 40 C.F.R. pt. 136. If 40 C.F.R. pt. 136 does not cover the pollutant in question, the handling, preservation, and analysis must be performed in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater." All analyses shall be performed using a detection level less than the lowest applicable regulatory discharge limit. If a parameter does not have a limit, then the detection level is defined as the method detection limit (MDL) and limit of quantitation (LOQ) required by the analytical method that is used to analyze the parameter. If the method does not contain an MDL or LOQ, the lab must use an approved method that does contain an MDL or LOQ. If none of the approved methods contain an MDL or LOQ for that parameter then the lab must develop its own LOQ, and report it with the analytical results.
- 2 Non-polar material shall mean that portion of the oil and grease that is not eliminated from a solution containing N-Hexane, or any other extractant the EPA shall prescribe, by silica gel or any other means of adsorption the EPA shall prescribe.
- 3 Analysis for PCB's must be done by EPA method 608 with MDL=<65 ppt. PCB's (total) is the sum of PCB-1242 (Aroclor 1242), PCB-1254 (Aroclor 1254), PCB-1221 (Aroclor 1221), PCB-1232 (Aroclor 1232), PCB-1248 (Aroclor 1248), PCB-1260 (Aroclor 1260) and PCB-1016 (Aroclor 1016).
- 4 Total Nitrogen = Total Kjeldahl Nitrogen (TKN) + Nitrite (NO<sub>2</sub>) + Nitrate (NO<sub>3</sub>).



**Permit Type:** DEWATERING PERMIT **Permit No:** C001207810

**Customer's Name:** TENEN ENVIRONMENTAL  
**Customer's Service Address:**

**Phone Number:**  
**Account Number:** 1001053370001

**Customer's Mailing Address:** 121 WEST 27TH STREET  
NEW YORK, NY 10001

**Issued By:** CL  
**Permitted Activity:** Dewatering permit for 756,000 gallons of discharge (11/22/2021 thru 02/28/2022) @ \$6.51 per hundred cubic feet-27-01 Jackson Ave, Queens File # C-7398, Permit Fee \$6579.62

**Issue Date:** 12/07/2021  
**Expiration Date:** 02/28/2022  
**Fee:** \$6,579.62

**Permittee:** Tenen Environmental  
**Dewatering Location:** C-7398, 27-01 Jackson Ave, Queens  
**BBL:**

**Additional Requirements:**

1. If the approval is revoked, the permit is no longer valid.

2021 DEC -7 P 6:53  
DEP PERMIT QUEENS OFFICE

**APPENDIX G**  
**HEALTH AND SAFETY PLAN**

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# HEALTH AND SAFETY PLAN

for

**27-01 JACKSON AVENUE  
LONG ISLAND CITY, NEW YORK  
NYSDEC BCP Site No. C241209  
Queens Borough Tax Map Block 432, Lot 21**

*Prepared For:*

**2701 Jackson Avenue LLC  
425 Northern Boulevard  
Great Neck, New York 11021**

*Prepared By:*

**Langan Engineering, Environmental, Surveying,  
Landscape Architecture and Geology, D.P.C.  
21 Penn Plaza  
360 West 31<sup>st</sup> Street, 8<sup>th</sup> Floor  
New York, New York 10001**

**LANGAN**

**June 2022**

**Langan Project Number: 170472002**

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\* Items to be posted prominently on site, or made readily available to personnel.



## **1.0 INTRODUCTION**

### **1.1 General**

This HEALTH AND SAFETY PLAN (HASP) was developed to address disturbance of known and reasonably anticipated subsurface contaminants and comply with Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.120(b)(4), *Hazardous Waste Operations and Emergency Response* during site work for the southern- and western-adjointing sidewalks along Jackson Avenue and 43rd Avenue (hereafter referred to as the "Site") associated with the property defined as 27-01 Jackson Avenue (Brownfield Cleanup Program [BCP] site number C241209) in the Long Island City neighborhood of Queens, New York. The legal description for the property located at 27-01 Jackson Avenue is the Borough of Queens Tax Block 432, Lot 21.

This HASP provides the minimum requirements for implementing site operations during future remedial measure activities. All contractors performing work on this site shall implement their own HASP that, at a minimum, adheres to this HASP. The contractor is responsible for their own health and safety and that of their subcontractors. Langan personnel will implement this HASP while onsite.

The management of the day-to-day site activities and implementation of this HASP in the field is the responsibility of the site Langan Field Team Leader (FTL). Assistance in the implementation of this HASP can also be obtained from the Langan Health and Safety Officer (HSO) and the Langan Health and Safety Manager (HSM). Contractors operating on the site shall designate their own FTL, HSO and HSM. The content of this HASP may change or undergo revision based upon additional information made available to health and safety personnel, monitoring results, or changes in the work plan.

### **1.2 Site Location and Background**

The BCP site is located at 27-01 Jackson Avenue in the Long Island City neighborhood of Queens, New York and is identified as Block 432, Lot 21, on the Queens Borough Tax Map. A site location map showing the BCP site and the southern- and western-adjointing sidewalks is provided as Figure 1. The BCP site encompasses an area of about 10,000 square feet ( $\pm 0.23$  acres) and was previously occupied by a gas station with a one-story convenience store and auto repair garage. The BCP site is bound by multi-story mixed-use commercial and residential buildings followed by Hunter Street to the north; vacant property followed by multi-story commercial buildings and 42nd Road to the east; Jackson Avenue followed by a one-story commercial use building to the south; and 43rd Avenue followed by a multi-story mixed-use commercial and residential building to the west.

Petroleum-impacted soil and groundwater were identified beneath the BCP site and the southern- and western-adjointing sidewalks along Jackson Avenue and 43rd Avenue during subsurface investigations performed in April and June 2013. The impacts are related to open New York State Department of Environmental Conservation (NYSDEC) spill No. 9913082, which was reported in 2000 during the removal of ten 550-gallon gasoline underground storage tanks (USTs), closed in 2005, and re-opened in April 2013 following the aforementioned subsurface investigation. The site is listed in the U.S. Historical Auto Stations database for former operations as a gas station and auto repair shop, and in the NYSDEC Petroleum Bulk Storage (PBS) database as currently housing three 4,000-gallon gasoline USTs and one 4,000-gallon diesel UST (PBS Site No. 2-090565). A representative of American Lions, the current owner of the property, confirmed that the 4,000-gallon USTs were removed in June 2015.

### **1.3 Summary of Work Tasks**

#### **1.3.1 Groundwater Investigation and Sampling**

Groundwater samples will be collected from one or more of the observation/monitoring wells in accordance with the Langan Low Flow Groundwater Sampling SOP and specified in the Site Management Plan (SMP).

Groundwater samples will be submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory and analyzed in accordance with work plan specifications.

#### **1.3.2 QA/QC Sampling**

Samples for quality assurance/quality control [QA/QC] samples may also be collected and submitted to an approved laboratory and analyzed in accordance with work plan specifications. Information regarding the QA/QC samples including required method of analysis may be included in the same COC as the soil samples unless otherwise instructed by the work plan.

#### **1.3.3 Groundwater Gauging**

Langan may gauge one or more of the observation/monitoring wells to collect synoptic head data or determine the presence of product. When gauging, Langan may also survey head space VOCs within the well using a duly calibrated PID. When collected, gauging data will be based on the northernmost point at top of casing (TOC) using an interface probe (IP) capable of determining the presence of free product in the monitoring well either as light non-aqueous phase liquid (LNAPL) at the top of the water column or as dense non-aqueous phase liquid

(DNAPL) at the base of the monitoring well or water meter. Langan will decontaminate gauging equipment between wells.

### **1.3.4 Observation/Monitoring Well Plugging and Abandonment**

At an unspecified future date, the observation/monitoring wells will be abandoned. Plugging and abandonment will be in accordance with federal and state requirements. Langan may retain a drilling contractor to complete the plugging and abandonment activities. The contractor will contact the appropriate utility mark-out authority and make available to their field staff the verification number and effective dates. Langan may observe the plugging and abandonment of one or more observation/monitoring wells to document that the plugging and abandonment activities were completed in accordance with the work plan and regulations.

### **1.3.5 Equipment Decontamination**

Before the start of the day's sampling and after sampling each run, sampling equipment will be decontaminated by the decontamination process outlined Attachment B - Decontamination Procedures. Decontamination wastes and purge water will be temporarily stored on site pending analytical results.

### **1.3.6 Management of Investigative-Derived Waste**

The investigative-derived waste (IDW) generated during this investigation will be contained in DOT-approved 55-gallon drums. The drums will be temporarily stored on the site or as directed by the client representative. All drums will be filled between to two-thirds full to allow easy maneuvering during drum pickup and disposal. Drum labels are to be provided by Langan (Environmental Closet). All drums will be labeled as "IDW Pending Analysis" until sample data are reported from the laboratory. Drum labels will include date filled and locations where waste was generated along with the standard information required by the labels in accordance with the Langan SOP09, Drum Labeling..

Closed top drums are to be used to store liquids. Debris, including plastic sheeting, polyethylene tubing, personal protection equipment (PPE), decontamination debris, etc. will be segregated from and disposed in large heavy duty garbage bags and disposed of at the site. Excess unused glassware should be returned to the lab along with the last day of collection samples.

### **1.3.7 Drum Sampling**

Langan personnel may collect drum samples, as required, prior to off-site drum disposal. Samples will be placed into laboratory-supplied batch-certified clean glassware and submitted to

an approved laboratory and analyzed in accordance with work plan specifications, if required.

### **1.3.8 Surveying**

Surveying activities may be completed by Langan. Surveying will be conducted by licensed surveyors.

## **2.0 IDENTIFICATION OF KEY PERSONNEL/HEALTH AND SAFETY PERSONNEL**

The following briefly describes the health and safety (H&S) designations and general responsibilities that may be employed for this site. The titles have been established to accommodate the project needs and requirements and ensure the safe conduct of site activities. The H&S personnel requirements for a given work location are based upon the proposed site activities.

### **2.1 Langan Project Manager**

The Langan Environmental Project Manager (PM) is Brian Gochenaur, his responsibilities include:

- Ensuring that this HASP is developed, current, and approved prior to on-site activities.
- Ensuring that all the tasks in the project are performed in a manner consistent with Langan's comprehensive *Health and Safety Program for Hazardous Waste Operations* and this HASP.

### **2.2 Langan Corporate Health and Safety Manager**

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

- Updating the *Construction Health and Safety Program for Hazardous Waste Operations*.
- Assisting the site Health and Safety Officer (HSO) with development of the HASP, updating HASP as dictated by changing conditions, jobsite inspection results, etc. and approving changes to this HASP.
- Assisting the HSO in the implementation of this HASP and conducting Jobsite Safety Inspections and assisting with communication of results and correction of shortcomings found.
- Maintaining records on personnel (medical evaluation results, training and certifications, accident investigation results, etc.).

### **2.3 Langan Site Health & Safety Officer**

The Langan HSO is William Bohrer. His responsibilities include:

- Participating in the development and implementation of this HASP.
- When on-site, assisting the Langan Field Team Leader in conducting Tailgate Safety Meetings and Jobsite Safety Inspections and correcting any shortcomings in a timely manner.
- Ensuring that proper PPE is available, worn by employees, and properly stored and maintained.
- Controlling entry into and exit from the site contaminated areas or zones.
- Monitoring employees for signs of stress, such as heat stress, fatigue, and cold exposure.
- Monitoring site hazards and conditions.
- Knowing (and ensuring that all site personnel also know) emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.
- Resolving conflicts that may arise concerning safety requirements and working conditions.
- Reporting all incidents, injuries and near misses to the Langan Incident/Injury Hotline immediately and the client representative.

### **2.4 Langan Field Team Leader Responsibilities**

The Langan Field Team Leader (FTL) is Kimberly Semon. The Field Team Leader's responsibilities include:

- The management of the day-to-day site activities and implementation of this HASP in the field.
- Participating in and/or conducting Tailgate Safety Meetings and Jobsite Safety Inspections and correcting any shortcomings in a timely manner.
- When a Community Air Monitoring Operating Program (CAMP) is part of the scope, the FTL will set up and maintaining community air monitoring activities and instructing the responsible contractor to implement organic vapor or dust mitigation when necessary.
- Overseeing the implementation of activities specified in the work plan.

### **2.5 Contractor Responsibilities**

The contractor shall develop and implement their own HASP for their employees, lower-tier subcontractors, and consultants. The contractor is responsible for their own health and safety

and that of their subcontractors. Contractors operating on the site shall designate their own FTL, HSO and HSM. The contractor's HASP will be at least as stringent as this Langan HASP. The contractor must be familiar with and abide by the requirements outlined in their own HASP. A contractor may elect to adopt Langan's HASP as its own provided that it has given written notification to Langan, but where Langan's HASP excludes provisions pertinent to the contractor's work (i.e., confined space entry); the contractor must provide written addendums to this HASP. Additionally, the contractor must:

- Ensure their employees are trained in the use of all appropriate PPE for the tasks involved;
- Notify Langan of any hazardous material brought onto the job site or site related area, the hazards associated with the material, and must provide a material safety data sheet (MSDS) or safety data sheet (SDS) for the material;
- Have knowledge of, understand, and abide by all current federal, state, and local health and safety regulations pertinent to the work;
- Ensure their employees handling hazardous materials, if identified at the site, have received current training in the appropriate levels of 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER) if hazardous waste is identified at the Site;
- Ensure their employees handling hazardous materials, if identified at the Site, have been fit-tested within the year on the type respirator they will wear; and
- Ensure all air monitoring is in place pertaining to the health and safety of their employees as required by OSHA 1910.120; and
- All contractors must adhere to all federal, state, and local regulatory requirements.

### **3.0 TASK/OPERATION SAFETY AND HEALTH RISK ANALYSES**

A Task-Hazard Analysis (Table 1) was completed for general construction hazards that may be encountered at the Site. The potential contaminants that might be encountered during the field activities and the exposure limits are listed in Table 2 complete inventory of MSDS/SDS for chemical products used on site is included as Attachment E.

#### **3.1 Specific Task Safety Analysis**

##### **3.1.1 Groundwater Sampling**

Sampling groundwater requires the donning of chemical resistant gloves in addition to the standard PPE and cut resistant gloves when cutting sampling-tubing to length.

### **3.1.2 Monitoring Well Gauging**

Langan will don work gloves when opening the well box pulling the well plug and nitrile gloves when handling the interface probe in addition to standard PPE. Langan may record the head space VOCs with a PID and record the survey data. If product is observed in the well, Langan personnel may use product absorbing socks and pads.

### **3.1.3 Plugging and Abandonment of Observation/Monitoring Wells**

Langan personnel are not to operate equipment nor assist in the plugging and abandonment of the observation/monitoring wells. These tasks are to be completed by the contractor.

### **3.1.4 Drum Sampling**

Drilling fluid, rinse water, grossly-contaminated soil samples and cuttings will be containerized in 55-gallon drums for disposed off-site. Each drum must be labeled in accordance with the Langan Drum Labeling Standard Operating Procedure (SOP-#9). Sampling drums requires the donning of work gloves when opening the drums and chemical resistant gloves when sampling in addition to standard PPE.

Langan personnel and contractors are not to move or opened any orphaned (unlabeled) drum found on the site without approval of the project manager.

## **3.2 Radiation Hazards**

No radiation hazards are known or expected at the site.

## **3.3 Physical Hazards**

Physical hazards, which may be encountered during site operations for this project, are detailed in Table 1.

### **3.3.1 Explosion**

No explosion hazards are expected for the scope of work at this site.

### **3.3.2 Heat Stress**

The use of Level C protective equipment, or greater, may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient

temperature is 72°F or above. Table 6 presents the suggested frequency for such monitoring. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Refer to the Table 7 to assist in assessing when the risk for heat related illness is likely. To use this table, the ambient temperature and relative humidity must be obtained (a regional weather report should suffice). Heat stress monitoring should be performed by the HSO or the FTL, who shall be able to recognize symptoms related to heat stress.

To monitor the workers, be familiar with the following heat-related disorders and their symptoms:

- **Heat Cramps:** Painful spasm of arm, leg or abdominal muscles, during or after work
- **Heat Exhaustion:** Headache, nausea, dizziness; cool, clammy, moist skin; heavy sweating; weak, fast pulse; shallow respiration, normal temperature
- **Heat Stroke:** Headache, nausea, weakness, hot dry skin, fever, rapid strong pulse, rapid deep respirations, loss of consciousness, convulsions, coma. *This is a life threatening condition.*

Do not permit a worker to wear a semi-permeable or impermeable garment when they are showing signs or symptoms of heat-related illness.

To monitor the worker, measure:

- **Heart rate:** Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third. A worker cannot return to work after a rest period until their heart rate is below 100 beats per minute.
- **Oral temperature:** Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking). If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period. A worker cannot return to work after a rest period until their oral temperature is below 99.6°F. If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third. Do not permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

Prevention of Heat Stress - Proper training and preventative measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:



- Adjust work schedules.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
  - Maintain water temperature 50° to 60°F (10° to 16.6°C).
  - Provide small disposal cups that hold about four ounces (0.1 liter).
  - Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.
  - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.
  - Train workers to recognize the symptoms of heat related illness.

### 3.3.3 Cold-Related Illness

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally called frostbite.

- **Hypothermia** - Hypothermia is defined as a decrease in the patient core temperature below 96°F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interference with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a "cold" ambient temperature. Symptoms of hypothermia include: shivering, apathy, listlessness, sleepiness, and unconsciousness.
- **Frostbite** - Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 20°F. Symptoms of frostbite are: a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale, and solid.

Prevention of Cold-Related Illness - To prevent cold-related illness:

- Educate workers to recognize the symptoms of frostbite and hypothermia
- Identify and limit known risk factors:
- Assure the availability of enclosed, heated environment on or adjacent to the site.
- Assure the availability of dry changes of clothing.
- Assure the availability of warm drinks.
- Start (oral) temperature recording at the job site:
- At the FSO or Field Team Leader's discretion when suspicion is based on changes in a worker's performance or mental status.
- At a worker's request.
- As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20°F, or wind-chill less than 30°F with precipitation).
- As a screening measure whenever anyone worker on the site develops hypothermia.

Any person developing moderate hypothermia (a core temperature of 92°F) cannot return to work for 48 hours.

### **3.3.4 Noise**

Work activities during the proposed activities may be conducted at locations with high noise levels from the operation of equipment. Hearing protection will be used as necessary.

### **3.3.5 Hand and Power Tools**

The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. All hand and power tools should be inspected for health and safety hazards prior to use. If deemed unserviceable/un-operable, notify supervisor and tag equipment out of service. Ground Fault Circuit Interrupters (GFCI) are required for all power tools requiring direct electrical service.

### **3.3.6 Slips, Trips and Fall Hazards**

Care should be exercised when walking at the site, especially when carrying equipment. The presence of surface debris, uneven surfaces, pits, facility equipment, and soil piles contribute to tripping hazards and fall hazards. To the extent possible, all hazards should be identified and marked on the site, with hazards communicated to all workers in the area.

### **3.3.7 Utilities (Electrocution and Fire Hazards)**

#### *3.3.7.1 Utility Clearance*

The possibility of encountering underground utilities poses fire, explosion, and electrocution hazards. All excavation work will be preceded by review of available utility drawings and by notification of the subsurface work to the N.Y. One –Call–Center.

#### *3.3.7.2 Lockout-Tagout*

The potential adverse effects of electrical hazards include burns and electrocution, which could result in death. Therefore, there is a procedure that establishes the requirements for the lockout/tagout (LOTO) of energy isolating devices in accordance with the OSHA electrical lockout and tagging requirements as specified in 29 CFR 1926.417. This procedure will be used to ensure that all machines and equipment are isolated from potentially hazardous energy. If possible, equipment that could cause injury due to unexpected energizing, start-up, or release of stored energy will be locked/tagged, before field personnel perform work activities.

Depending upon the specific work task involved, Langan’s SSC or FTL will serve as the authorized lockout/tagout coordinator, implement the lockout/tagout procedure and will be responsible to locate, lock and tag valves, switches, etc.

**SPECIAL NOTE:** Project personnel will assume that all electrical equipment at surface, subsurface and overhead locations is energized, until equipment has been designated and confirmed as de-energized by a utility company representative. Langan will notify the designated utility representative prior to working adjacent to this equipment and will verify that the equipment is energized or de-energized in the vicinity of the work location.

No project work shall be performed by Langan personnel or subcontractors on or near energized electrical lines or equipment unless hazard assessments are completed in writing, reviewed by Langan’s SSHO, and clearly communicated to the field personnel.

The FTL shall conduct a survey to locate and identify all energy isolating devices. They shall be certain which switches, valves or other isolating devices apply to the equipment. The lockout/tagout procedure involves, but is not limited to, electricity, motors, steam, natural gas, compressed air, hydraulic systems, digesters, sewers, etc.

### **3.3.8 Physical Hazard Considerations for Material Handling**

There are moderate to severe risks associated with moving heavy objects at the Site. The

following physical hazards should be considered when handling materials at the Site:

- Heavy objects will be lifted and moved by mechanical devices rather than manual effort whenever possible.
- The mechanical devices will be appropriate for the lifting of moving task and will be operated only by trained and authorized personnel.
- Objects that require special handling or rigging will only be moved under the guidance of a person who has been specifically trained to move such objects.
- Lifting devices will be inspected, certified, and labeled to confirm their weight capacities. Defective equipment will be taken out of service immediately and repaired or destroyed.
- The wheels of any trucks being loaded or unloaded will be chocked to prevent movement. Outriggers will be fully extended on a flat, firm surface during operation.
- Personnel will not pass under a raised load, nor will a suspended load be left unattended.
- Personnel will not be carried on lifting equipment, unless it is specifically designed to carry passengers.
- All reciprocating, rotating, or other moving parts will be guarded at all times.
- Accessible fire extinguishers, currently (monthly) inspected, will be available in all mechanical lifting devices.
- Verify all loads/materials are secure before transportation.

Material handling tasks that are unusual or require specific guidance will need a written addendum to this HASP. The addendum must identify the lifting protocols before the tasks are performed. Upon approval, the plan must be reviewed with all affected employees and documented. Any deviation from a written plan will require approval by the Langan HSM.

### **3.3.9 Hearing Conservation**

Under the construction industry standard, the maximum permissible occupational noise exposure is 90 dbA (8-hour TWA), and noise levels in excess of 90 dbA must be reduced through feasible administrative and engineering controls (20 CFR 1926.52). Hearing protection is required when working within 15 feet of vacuum extraction equipment and drill rigs.

### **3.3.9 Open Water**

Employees working over or near water, where the danger of drowning exists, shall be provided with U.S. Coast Guard-approved life jackets or buoyant work vests. Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

And should a worker fall into the water, OSHA requires (29 CFR 1926.106(c)) that ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. The distance between ring buoys shall not exceed 200 feet. Another remedial action required by OSHA (29 CFR 1926.106(d)) is the use of lifesaving skiffs.

OSHA requires that at least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water and must include the following provisions.

- The skiff must be in the water or capable of being quickly launched by one person.
- At least one person must be present and specifically designated to respond to water emergencies and operate the skiff at all times when there are employees above water.
- When the operator is on break another operator must be designated to provide requisite coverage when there are employees above water.
- The designated operator must either have the skiff staffed at all times or have someone remain in the immediate area such that the operator can quickly reach the skiff and perform rescue services.
- The skiff operator maybe assigned other tasks provided the tasks do not interfere with the operator's ability to quickly reach the skiff.
- A communication system, such as a walkie-talkie, must be used to inform the skiff operator of an emergency and to inform the skiff operator where the skiff is needed.
- The skiff must be equipped with both a motor and oars.

With regard to the number of skiffs required and the appropriate maximum response time, the following factors must be evaluated:

- The number of work locations where there is a danger of falling into water;
- The distance to each of those locations;
- Water temperature and currents;
- Other hazards such as, but not limited to, rapids, dams, and water intakes;

Other regulations that present S&H practices and PPE for work on or near water include: 29 CFR 1910, Subpart T (401 – 440)

### **3.4 Biological Hazards**

#### **3.4.1 Animals**

There is a possibility of encountering wildlife including reptiles, rodents and other small and medium size mammals. The Langan personnel is to avoid interacting with any wildlife.

### **3.4.2 Insects**

Ticks and other biting or stinging insects may to be encountered during site operations. Langan personnel should take necessary precautions including donning long sleeve shirts and insecticide to prevent bites and stings. After field work, Langan personnel should perform a complete visual inspection of their clothing to insure they are not inadvertently harboring ticks. If they do observe a tick bite, they are to contact the HSM or HSO and report the event.

### **3.4.3 Plants**

Poisonous plants may to be encountered during site operations. Langan personnel should take necessary precautions including donning long sleeve shirts and applying preventative poison Ivy/Sumac lotion to prevent or limit effects of exposure. If after field work, Langan employees do observe a reaction to poisonous plant exposure, they are to contact the HSM or HSO and report the event.

### **3.4.4 Coronavirus**

#### *3.4.4.1 General Preventative Measures*

Field personnel must follow general proper hygiene measures while in the field including:

- Avoid touching eyes, nose and mouth.
- Cover cough or sneeze with tissue, and throw in trash.
- Wash hands often with soap and water for 20 seconds after going to bathroom, before eating, after blowing nose, coughing or sneezing.
- Use hand sanitizer with at least 60% alcohol if soap and water are not available.
- Avoid physical contact with other people (e.g., no handshakes).
- Maintain a safe distance of at least 6 feet from other people (social distancing).
- Wear face coverings when around other worker to minimize spread of COVID-19. (May be required in certain states or locations.)

#### *3.4.4.2 Construction Trailers*

Employees should avoid use of shared construction trailers or where employees cannot maintain a safe distance (minimum 6 feet) from other workers. If trailer use is needed, areas such as desks, phones, chairs and other common areas, should be cleaned and disinfected before and after use. Protocols should be developed to minimize trailer use to essential personal, restrict use from any workers who are ill or showing symptoms of being ill, and ensure a safe distance

of 6 feet can be established between workers.

#### *3.4.4.3 Communication*

Include Coronavirus topics and prevention topics in daily tailgate meetings to ensure Coronavirus awareness is communicated daily. Discussions can focus on general topics including: social distancing, prevention measures for field personnel, signs and symptoms and recent news on the Coronavirus. Site-specific topics should include minimizing face-to-face contact, disinfecting/sterilizing field equipment, use of PPE to reduce exposure, site security and other potential exposure issues/concerns.

#### *3.4.4.4 Sick/Ill Workers*

No Langan employee is permitted to be onsite when ill and/or showing potential symptoms of the Coronavirus. Symptoms of the Coronavirus may appear 2-14 days after exposure and can range from mild to severe. The most common symptoms include: fever, fatigue, dry cough and shortness of breath. If an employee or subcontractor is observed being ill or exhibiting symptoms of Coronavirus, employees must immediately utilize their Stop Work Authority and contact their project manager to address the situation. If an employee observes another worker onsite exhibiting symptoms of Coronavirus, immediately utilize Stop Work Authority and notify their project manager and site construction manager or safety officer. Work should resume when the safety and health of Langan and subcontractors is adequately addressed.

### **3.5 Additional Safety Analysis**

#### **3.5.1 Presence of Non-Aqueous Phase Liquids (NAPL)**

There is potential for exposure to NAPL at this site. Special care and PPE should be considered when NAPL is observed as NAPL is a typically flammable fluid and releases VOCs known to be toxic and/or carcinogenic. If NAPL is present in a monitoring well, vapors from the well casing may contaminate the work area breathing zone with concentrations of VOCs potentially exceeding health and safety action levels. In addition, all equipment used to monitor or sample NAPL (or ground water from wells containing NAPL) must be intrinsically safe. Equipment that directly contacts NAPL must also be resistant to organic solvents.

At a minimum, a PID should be used to monitor for VOCs when NAPL is observed. If NAPL is expected to be observed in an excavation or enclosed area, air monitoring must be started using calibrated air monitoring equipment designed to sound an audio alarm when atmospheric concentrations of VOC are within 10% of the LEL. In normal atmospheric oxygen concentrations, the LEL monitoring may be done with a Wheatstone bridge/catalytic bead type sensor (i.e.

MultiRAE). However in oxygen depleted atmospheres (confined space), only an LEL designed to work in low oxygen environments may be used. Best practices require that the LEL monitoring unit be equipped with a long sniffer tube to allow the LEL unit to remain outside the UST excavation.

When NAPL is present, Langan personnel are required to use disposable nitrile gloves at all times to prevent skin contact with contaminated materials. They should also consider having available a respirator and protective clothing (Tyvek® overalls), especially if NAPL is in abundance and there are high concentrations of VOCs.

All contaminated disposables including PPE and sampling equipment must be properly disposed of in labeled 55-gallon drums

### **3.6 Job Safety Analysis**

A Job Safety Analysis (JSA) is a process to identify existing and potential hazards associated with each job or task so these hazards can be eliminated, controlled or minimized. A JSA will be performed at the beginning of each work day, and additionally whenever an employee begins a new task or moves to a new location. All JSAs must be developed and reviewed by all parties involved. A blank JSA form and documentation of completed JSAs are in Attachment G.

## **4.0 PERSONNEL TRAINING**

### **4.1 Basic Training**

Completion of an initial 40-hour HAZWOPER training program as detailed in OSHA's 29 CFR 1910.120(e) is required for all employees working on a site engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances, health hazards, or safety hazards as defined by 29 CFR 1910.120(a). Annual 8-hour refresher training is also required to maintain competencies to ensure a safe work environment. In addition to these training requirements, all employees must complete the OSHA 10 hour Construction Safety and Health training and supervisory personnel must also receive eight additional hours of specialized management training. Training records are maintained by the HSM.

### **4.2 Initial Site-Specific Training**

Training will be provided to specifically address the activities, procedures, monitoring, and equipment for site operations at the beginning of each field mobilization and the beginning of each discrete phase of work. The training will include the site and facility layout, hazards, and emergency services at the site, and will detail all the provisions contained within this HASP. For



a HAZWOPER operation, training on the site must be for a minimum of 3 days. Specific issues that will be addressed include the hazards described in Section 3.0.

### **4.3 Tailgate Safety Briefings**

Before starting work each day or as needed, the Langan HSO will conduct a brief tailgate safety meeting to assist site personnel in conducting their activities safely. Tailgate meetings will be documented in Attachment H. Briefings will include the following:

- Work plan for the day;
- Review of safety information relevant to planned tasks and environmental conditions;
- New activities/task being conducted;
- Results of Jobsite Safety Inspection Checklist;
- Changes in work practices;
- Safe work practices; and
- Discussion and remedies for noted or observed deficiencies.

## **5.0 MEDICAL SURVEILLANCE**

All personnel who will be performing field work involving potential exposure to toxic and hazardous substances (defined by 29 CFR 1910.120(a)) will be required to have passed an initial baseline medical examination, with follow-up medical exams thereafter, consistent with 29 CFR 1910.120(f). Medical evaluations will be performed by, or under the direction of, a physician board-certified in occupational medicine.

Additionally, personnel who may be required to perform work while wearing a respirator must receive medical clearance as required under CFR 1910.134(e), *Respiratory Protection*. Medical evaluations will be performed by, or under the direction of, a physician board-certified in occupational medicine. Results of medical evaluations are maintained by the HSM.

## **6.0 PERSONAL PROTECTIVE EQUIPMENT**

### **6.1 Levels of Protection**

Langan will provide PPE to Langan employees to protect them from the specific hazards they are likely to encounter on-site. Direct hired contractors will provide their employees with equivalent PPE to protect them from the specific hazards likely to be encountered on-site. Selection of the appropriate PPE must take into consideration: (1) identification of the hazards or suspected hazards; (2) potential exposure routes; and, (3) the performance of the PPE construction (materials and seams) in providing a barrier to these hazards.

Based on anticipated site conditions and the proposed work activities to be performed at the site, Level D protection will be used. The upgrading/downgrading of the level of protection will be based on continuous air monitoring results as described in Section 6.0 (when applicable). The decision to modify standard PPE will be made by the site HSO or FTL after conferring with the PM. The levels of protection are described below.

**Level D Protection (as needed)**

- Safety glasses with side shields or chemical splash goggles
- Safety boots/shoes
- Coveralls (Tyvek® or equivalent)
- Hard hat
- Long sleeve work shirt and work pants
- Nitrile gloves
- Hearing protection
- Reflective safety vest

**Level D Protection (Modified, as needed)**

- Safety glasses with sideshields or chemical splash goggles
- Safety boots/shoes (toe-protected)
- Disposable chemical-resistant boot covers
- Coveralls (polycoated Tyvek or equivalent to be worn when contact with wet contaminated soil, groundwater, or non-aqueous phase liquids is anticipated)
- Hard hat
- Long sleeve work shirt and work pants
- Nitrile gloves
- Hearing protection (as needed)
- Personal floatation device (for work within 5 feet of the water)
- Reflective traffic vest

**Level C Protection (as needed)**

- Full or Half face, air-purifying respirator, with NIOSH approved HEPA filter
- Inner (latex) and outer (nitrile) chemical-resistant gloves
- Safety glasses with side shields or chemical splash goggles
- Chemical-resistant safety boots/shoes
- Hard hat
- Long sleeve work shirt and work pants

- Coveralls (Tyvek® or equivalent)
- Hearing protection (as needed)
- Reflective safety vest

The action levels used in determining the necessary levels of respiratory protection and upgrading to Level C are summarized in Table 4. The written Respiratory Protection Program is maintained by the HSM and is available if needed. The monitoring procedures and equipment are outlined in Section 6.0 (when applicable).

## **6.2 Respirator Fit-Test**

All Langan employees who may be exposed to hazardous substances at the work site are in possession of a full- or half-face, air-purifying respirator and have been successfully fit-tested within the past year. Fit-test records are maintained by the HSM.

## **6.3 Respirator Cartridge Change-Out Schedule**

Respiratory protection is required to be worn when certain action levels (table 2) are reached. A respirator cartridge change-out schedule has been developed in order to comply with 29 CFR 1910.134. The respirator cartridge change-out schedule for this project is as follows:

- Cartridges shall be removed and disposed of at the end of each shift, when cartridges become wet or wearer experiences breakthrough, whichever occurs first.
- If the humidity exceeds 85%, then cartridges shall be removed and disposed of after 4 hours of use.

Respirators shall not be stored at the end of the shift with contaminated cartridges left on. Cartridges shall not be worn on the second day, no matter how short the time period was the previous day they were used.

## **7.0 AIR QUALITY MONITORING AND ACTION LEVELS**

### **7.1 Monitoring During Site Operations**

Atmospheric air monitoring results may be collected and used to provide data to determine when exclusion zones need to be established and when certain levels of personal protective equipment are required. For all instruments there are Site-specific action level criteria which are used in making field health and safety determinations. Other data, such as the visible presence of contamination or the steady state nature of air contaminant concentration, are also used in making field health and safety decisions. Therefore, the HSO may establish an exclusion zone

or require a person to wear a respirator even though atmospheric air contaminant concentrations are below established HASP action levels.

During site work involving disturbance of petroleum-impacted or fill material, real time air monitoring may be conducted for volatile organic compounds (VOCs). A photoionization detector (PID) and/or flame ionization detector (FID) will be used to monitor concentrations of VOCs at personnel breathing-zone height. Air monitoring will be the responsibility of the HSO or designee. Air monitoring may be conducted during intrusive activities associated with the completion of excavation, debris removal, and soil grading. All manufacturers' instructions for instrumentation and calibration will be available onsite.

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

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

### **7.1.1 Volatile Organic Compounds**

Monitoring with a PID, such as a MiniRAE 2000 (10.6v) or equivalent may occur during intrusive work in the AOCs. Colorimetric Indicator Tubes for benzene may be used as backup for the PID, if measurements remain above background monitor every 2 hours. The HSO will monitor the employee breathing zone at least every 30 minutes, or whenever there is any indication that concentrations may have changed (odors, visible gases, etc.) since the last measurement. If VOC levels are observed above 5 ppm for longer than 5 minutes or if the site PPE is upgraded to Level C, the HSO will begin monitoring the site perimeter at a location downwind of the AOC every 30 minutes in addition to the employee breathing zone. Instrument action levels for monitored gases are provided in Table 4.

### **7.1.2 Metals**

Based upon the site historical fill, there is a potential for the soils to contain PAHs and metals. During invasive procedures which have the potential for creating airborne dust, such as excavation of dry soils, a real time airborne dust monitor such as a Mini-Ram may be used to monitor for air particulates. The HSO will monitor the employee breathing zone at least every 30 minutes, or whenever there is any indication that concentrations may have changed (appearance of visible dust) since the last measurement. If dust levels are observed to be greater than 0.100 mg/m<sup>3</sup> or visible dust is observed for longer than 15 minutes or if the site PPE is upgraded to Level C, the HSO will begin monitoring the site perimeter at a location downwind of the AOC every 30 minutes in addition to the employee breathing zone. Instrument action levels for dust monitoring are provided in Table 4.

## **7.2 Monitoring Equipment Calibration and Maintenance**

Instrument calibration shall be documented and included in a dedicated safety and health logbook or on separate calibration pages of the field book. All instruments shall be calibrated before and after each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

All instruments shall be operated in accordance with the manufacturers' specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on site by the HSO for reference.

## **7.3 Determination of Background Levels**

Background (BKD) levels for VOCs and dust will be established prior to intrusive activities within the AOC at an upwind location. A notation of BKD levels will be referenced in the daily monitoring log. BKD levels are a function of prevailing conditions. BKD levels will be taken in an appropriate upwind location as determined by the HSO.

Table 4 lists the instrument action levels.

## **8.0 COMMUNITY AIR MONITORING PROGRAM**

Community air monitoring may be conducted in compliance with local standards or the generic CAMP outlined below:

Monitoring for dust and odors will be conducted during all ground intrusive activities by the FTL. Continuous monitoring on the perimeter of the work zones for odor, VOCs, and dust may be required for all ground intrusive activities such as soil excavation and handling activities. The work zone is defined as the general area in which machinery is operating in support of remediation activities. A portable PID will be used to monitor the work zone and for periodic monitoring for VOCs during activities such as soil and groundwater sampling and soil excavation. The site perimeter will be monitored for fugitive dust emissions by visual observations as well as instrumentation measurements (if required). When required, particulate or dust will be monitored continuously with real-time field instrumentation that will meet, at a minimum, the local standards or, default to the performance standards below:

If VOC monitoring is required, the following actions will be taken based on VOC levels measured:

- If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels

readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.

- If total VOC levels at the downwind perimeter of the hot zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet, is below 5 ppm above background for the 15-minute average.
- If the total VOC level is above 25 ppm at the perimeter of the hot zone, activities will be shut down.

If dust monitoring with field instrumentation is required, the following actions will be taken based on instrumentation measurements:

- If the downwind particulate level is 100 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression must be employed. Work may continue with dust suppression techniques provided that downwind PM10 levels do not exceed  $150 \mu\text{g}/\text{m}^3$  above the background level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM10 levels are greater than  $150 \mu\text{g}/\text{m}^3$  above the background level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 concentration to within  $150 \mu\text{g}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

## **8.1 Dust Suppression Techniques**

Preventative measures for dust generation may include wetting site fill and soil, construction of an engineered construction entrance with gravel pad, a truck wash area, covering soils with tarps, and limiting vehicle speeds to five miles per hour.

Work practices to minimize odors and vapors include limiting the time that the excavations remain open, minimizing stockpiling of contaminated-source soil, and minimizing the handling of contaminated material. Offending odor and organic vapor controls may include the application of foam suppressants or tarps over the odor or VOC source areas. Foam suppressants may include biodegradable foams applied over the source material for short-term control of the odor and

VOCs.

If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: direct load-out of soils to trucks for off-site disposal; use of chemical odorants in spray or misting systems; and, 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.

## **9.0 WORK ZONES AND DECONTAMINATION**

### **9.1 Site Control**

Work zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas.

Any person working in an area where the potential for exposure to site contaminants exists will only be allowed access after providing the HSO with proper training and medical documentation.

**Exclusion Zone (EZ)** - All activities which may involve exposure to site contaminants, hazardous materials and/or conditions should be considered an EZ. Decontamination of field equipment will also be conducted in the Contaminant Reduction Zone (CRZ) which will be located on the perimeter of the EZ. The EZ and the CRZ will be clearly delineated by cones, tapes or other means. The HSO may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the HSO allowing adequate space for the activity to be completed, field members and emergency equipment.

### **9.2 Contamination Zone**

#### **9.2.1 Personnel Decontamination Station**

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

## **9.2.2 Minimization of Contact with Contaminants**

During completion of all site activities, personnel should attempt to minimize the chance of contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination as PPE is intended to minimize accidental contact. This may ultimately minimize the degree of decontamination required and the generation of waste materials from site operations.

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

## **9.2.3 Personnel Decontamination Sequence**

Decontamination may be performed by removing all PPE used in EZ and placing it in drums/trash cans at the CRZ. Baby wipes should be available for wiping hands and face. Drums/trash cans will be labeled by the field crews in accordance with all local, state, and federal requirements. Management plans for contaminated PPE, and tools are provided below.

## **9.2.4 Emergency Decontamination**

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination and wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment. If the injured person can be moved, he/she will be decontaminated by site personnel as described above before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury), provisions shall be made to ensure that emergency response personnel will be able to respond to the victim without being exposed to potentially hazardous atmospheric conditions. If the potential for inhalation hazards exist, such as with open excavation, this area will be covered with polyethylene sheeting to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition, potential contaminants, and provided with all pertinent data.

## **9.2.5 Hand-Held Equipment Decontamination**

Hand-held equipment includes all monitoring instruments as stated earlier, samples, hand tools, and notebooks. The hand-held equipment is dropped at the first decontamination station to be decontaminated by one of the decontamination team members. These items must be decontaminated or discarded as waste prior to removal from the CRZ.



To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using wipes or paper towels if contamination is visually evident. Sampling equipment, hand tools, etc. will be cleaned with non-phosphorous soap to remove any potentially contaminated soil, and rinsed with deionized water. All decontamination fluids will be containerized and stored on-site pending waste characterization sampling and appropriate off-site disposal.

### 9.2.6 Heavy Equipment Decontamination

All heavy equipment and vehicles arriving at the work site will be free from contamination from offsite sources. Any vehicles arriving to work that are suspected of being impacted will not be permitted on the work site. Potentially contaminated heavy equipment will not be permitted to leave the EZ unless it has been thoroughly decontaminated and visually inspected by the HSO or his designee.

### 9.3 Support Zone

The support zone or cold zone will include the remaining areas of the job site. Break areas and support facilities (include equipment storage and maintenance areas) will be located in this zone. No equipment or personnel will be permitted to enter the cold zone from the hot zone without passing through the decontamination station in the warm zone (if necessitated). Eating, smoking, and drinking will be allowed only in this area.

### 9.4 Communications

The following communications equipment will be utilized as appropriate.

- Telephones - A cellular telephone will be located with the HSO for communication with the HSM and emergency support services/facilities.
- Hand Signals - Hand signals shall be used by field teams, along with the buddy system. The entire field team shall know them before operations commence and their use covered during site-specific training. Typical hand signals are the following:

Hand Signal	Meaning
Hand gripping throat	Out of air; cannot breathe
Grip partners wrists or place both hands around waist	Leave immediately without debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm alright; I understand

Hand Signal	Meaning
Thumbs down	No; negative
Simulated "stick" break with fists	Take a break; stop work

## 9.5 The Buddy System

When working in teams of two or more, workers will use the "buddy system" for all work activities to ensure that rapid assistance can be provided in the event of an emergency. This requires work groups to be organized such that workers can remain close together and maintain visual contact with one another. Workers using the "buddy system" have the following responsibilities:

- Provide his/her partner with assistance.
- Observe his/her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his/her partner's PPE.
- Notify the HSO or other site personnel if emergency service is needed.

## 10.0 NEAREST MEDICAL ASSISTANCE

The address and telephone number of the nearest hospital:

Mount Sinai Hospital of Queens  
25-10 30<sup>th</sup> Avenue  
Astoria, New York  
718-932-1000

Map with directions to the hospital are shown in Figure 2. This information will either be posted prominently at the site or will be available to all personnel all of the time. Further, all field personnel, including the HSO & FTL, will know the directions to the hospital.

## 11.0 STANDING ORDERS/SAFE WORK PRACTICES

The standing orders, which consist of a description of safe work practices that must always be followed while on-site by Langan employees and contractors, are shown in Attachment A. The site HSO and FTL each have the responsibility for enforcing these practices. The standing orders will be posted prominently at the site, or are made available to all personnel at all times. Those who do not abide by these safe work practices will be removed from the site.

## 12.0 SITE SECURITY

No unauthorized personnel shall be permitted access to the work areas.

### **13.0 UNDERGROUND UTILITIES**

As provided in Langan’s Underground Utility Clearance Guidelines, the following safe work practices should be followed by Langan personnel and the contractor before and during subsurface work in accordance with federal, state and local regulations:

- Obtain available utility drawings from the property owner/client or operator.
- Provide utility drawings to the project team.
- In the field, mark the proposed area of subsurface disturbance (when possible).
- Ensure that the utility clearance system has been notified.
- Ensure that utilities are marked before beginning subsurface work.
- Discuss subsurface work locations with the owner/client and contractors.
- Obtain approval from the owner/client and operators for proposed subsurface work locations.
- Use safe digging procedures when applicable.
- Stay at least 10 feet from all equipment performing subsurface work.

### **14.0 SITE SAFETY INSPECTION**

The Langan HSO or alternate will check the work area daily, at the beginning and end of each work shift or more frequently to ensure safe work conditions. The HSO or alternate must complete the Jobsite Safety Inspection Checklist, found in Attachment F. Any deficiencies shall be shared with the FTL, HSM and PM and will be discussed at the daily tailgate meeting.

### **15.0 HAND AND POWER TOOLS**

All hand- and electric-power tools and similar equipment shall be maintained in a safe operating condition. All electric-power tools must be inspected before initial use. Damaged tools shall be removed immediately from service or repaired. Tools shall be used only for the purpose for which they were designed. All users must be properly trained in their safe operation.

### **16.0 EMERGENCY RESPONSE**

#### **16.1 General**

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

incurred on site, record keeping, and emergency site evacuation procedures. In case of emergency, in addition to 911, call *Incident Intervention@* at 1-888-479-7787 to report their injuries. For all other communications, contact the Langan Incident Hotline at **(800) 9-LANGAN** (800-952-6426) extension 4699 as soon as possible.

Should outside assistance be needed for accidents, fire, or release of hazardous substances, the emergency numbers will be available and posted at the site (Table 5) where a readily accessible telephone is made available for emergency use.

Also, in the event of an incident where a team member becomes exposed or suffers from an acute symptom from contact with site materials and has to be taken to a hospital, a short medical data sheet (Attachment T) for that individual will be made available to the attending physician. The medical data sheet will include the following:

- Name, address, home phone
- Age, height, weight
- Name of person to be notified in case of an accident
- Allergies
- Particular sensitivities
- Does he/she wear contact lenses
- Short checklist of previous illness
- Name of personal physician and phone
- Name of company physician and phone
- Prescription and non-prescription medications currently used.

A sample medical data sheet is included in Attachment T.

## **16.2 Responsibilities**

### **16.2.1 Health and Safety Officer (HSO)**

The HSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The HSO is responsible for ensuring the HSM are notified of all incidents, all injuries, near misses, fires, spills, releases or equipment damage. The HSO is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the HSM can notify OSHA within the required time frame.

### **16.2.2 Emergency Coordinator**

The HSO or their designated alternate will serve as the Emergency Coordinator. The Emergency Coordinator is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. They are also responsible for ensuring the HSM are notified of all incidents, all injuries, near misses, fires, spills, releases or equipment damage. The Emergency Coordinator is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized).

The Emergency Coordinator shall locate emergency phone numbers and identify hospital routes prior to beginning work on the sites. The Emergency Coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator is responsible for implementing the Emergency Response Plan.

### **16.2.3 Site Personnel**

Project site personnel are responsible for knowing the Emergency Response Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency. Project site personnel, including all subcontractors will be trained in the Emergency Response Plan.

## **16.3 Communications**

Once an emergency situation has been stabilized, or as soon as practically, the injured Langan personnel should contact [Incident Intervention@](mailto:IncidentIntervention@) at 1-888-479-7787 to report their injuries. For all other communications, contact the Langan Incident Hotline at **(800) 9-LANGAN** (800-952-6426) extension 4699 as soon as possible.

## **16.4 Local Emergency Support Units**

In order to be able to deal with any emergency that might occur during investigative activities at the site, the Emergency Notification Numbers (Table 5) will be posted and provided to all personnel conducting work within the EZ.

Figure 2 shows the hospital route map. Outside emergency number 911 and local ambulance should be relied on for response to medical emergencies and transport to emergency rooms. Always contact first responders when there are serious or life threatening emergencies on the site. Project personnel are instructed not to drive injured personnel to the Hospital. In the event

of an injury, provide first aid and keep the injured party calm and protected from the elements and treat for shock when necessary.

### **16.5 Pre-Emergency Planning**

Langan will communicate directly with administrative personnel from the emergency room at the hospital in order to determine whether the hospital has the facilities and personnel needed to treat cases of trauma resulting from any of the contaminants expected to be found on the site. Instructions for finding the hospital will be posted conspicuously in the site office and in each site vehicle.

### **16.6 Emergency Medical Treatment**

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

- First Aid Kit: Contractor Vehicles
- Emergency Eye Wash: Contractor Vehicles

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that has been set up. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

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

Only in non-emergency situations may an injured person be transported to an urgent care facility. Due to hazards that may be present at the site and the conditions under which operations are conducted, it is possible that an emergency situation may develop. Emergency situations can be characterized as injury or acute chemical exposure to personnel, fire or explosion, environmental release, or hazardous weather conditions.

### **16.8 Emergency Site Evacuation Routes and Procedures**

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs as a result of the site investigation activities, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, the Langan Project Manager will be verbally notified immediately. All heavy equipment will be shut down and all personnel will evacuate the

work areas and assemble at the nearest intersection to be accounted for and to receive further instructions.

In the event that an emergency situation arises, the FTL will implement an immediate evacuation of all project personnel due to immediate or impending danger. The FTL will also immediately communicate with the contractor to coordinate any needed evacuation of the property.

The FTL or Site Supervisor will give necessary instructions until the Designated Incident Commander (IC) assumes control. After the emergency has been resolved, the FTL or Site Supervisor will coordinate with the IC and indicate when staff should resume their normal duties. If dangers are present for those at the designated assembly point, another designated location of assembly will be established.

It will be the responsibility of the FTL or Site Supervisor to report a fire or emergency, assess the seriousness of the situation, and initiate emergency measures until the arrival of the local fire fighters or other first responders, should they be necessary. The FTL, working with emergency responders, may also order the closure of the Site for an indefinite period as long as it is deemed necessary.

Under no circumstances will incoming visitors be allowed to proceed to the area of concern, once an emergency evacuation has been implemented. Visitors or other persons present in the area of the emergency shall be instructed to evacuate the area. The FTL will ensure that access roads are not obstructed and will remain on-site to provide stand-by assistance upon arrival of emergency personnel.

If it is necessary to temporarily control traffic in the event of an emergency, those persons controlling traffic will wear proper reflection warning vests until the arrival of police or fire personnel.

### **16.8.1 Designated Assembly Locations**

All personnel will evacuate the site and assemble at a designated assembly location. The assembly location will be designated by Langan personnel and discussed during each shift's pre-job safety briefing.

### **16.8.2 Accounting for Personnel**

All contractor and subcontractor supervisors are responsible for the accounting of all personnel assembled at the designed assembly area. The Designated Incident Commander shall be notified if personnel are not found.

## **16.9 Fire Prevention and Protection**

In the event of a fire or explosion, procedures will include immediately evacuating the site and notification of the Langan Project Manager of the investigation activities. Portable fire extinguishers will be provided at the work zone. The extinguishers located in the various locations should also be identified prior to the start of work. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

### **16.9.1 Fire Prevention**

Fires will be prevented by adhering to the following precautions:

Good housekeeping and storage of materials.

- Storage of flammable liquids and gases away from oxidizers.
- Shutting off engines to refuel.
- Grounding and bonding metal containers during transfer of flammable liquids.
- Use of UL approved flammable storage cans.
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities.

The person responsible for the control of fuel source hazards and the maintenance of fire prevention and/or control equipment is the HSO.

## **16.10 Significant Vapor Release**

Based on the proposed tasks, the potential for a significant vapor release is low. However, if a release occurs, the following steps will be taken:

- Move all personnel to an upwind location. All non-essential personnel shall evacuate.
- Upgrade to Level C Respiratory Protection.
- Downwind perimeter locations shall be monitored for volatile organics.
- If the release poses a potential threat to human health or the environment in the community, the Emergency Coordinator shall notify the Langan Project Manager.
- Local emergency response coordinators will be notified.

## **16.11 Overt Chemical Exposure**

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet (MSDS) will be followed, when necessary.



**SKIN AND EYE:** Use copious amounts of soap and water from eye-wash kits and portable hand wash stations.

**CONTACT:** Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Skin shall also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs. Affected items of clothing shall also be removed from contact with skin.

Providing wash water and soap will be the responsibility of each individual contractor or subcontractor on-site.

### **16.12 Decontamination during Medical Emergencies**

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or omitted. The HSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

### **16.13 Adverse Weather Conditions**

In the event of adverse weather conditions, the HSO will determine if work will continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds).
- Limited visibility (fog).
- Potential for electrical storms.
- Earthquakes.
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The HSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

#### **16.14 Spill Control and Response**

All small spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining proper waste characterization and the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. All spill containment materials will be properly disposed. An exclusion zone of 50 to 100 feet around the spill area should be established depending on the size of the spill.

All contractor vehicles shall have spill kits on them with enough material to contain and absorb the worst-case spill from that vehicle. All vehicles and equipment shall be inspected prior to be admitted on site. Any vehicle or piece of equipment that develops a leak will be taken out of service and removed from the job site.

The following seven steps shall be taken by the Emergency Coordinator:

1. Determine the nature, identity and amounts of major spills.
2. Make sure all unnecessary persons are removed from the spill area.
3. Notify the HSO immediately.
4. Use proper PPE in consultation with the HSO.
5. If a flammable liquid, gas or vapor is involved, remove all ignition sources and use non-sparking and/or explosion-proof equipment to contain or clean up the spill (diesel-only vehicles, air-operated pumps, etc.)
6. If possible, try to stop the leak with appropriate material.
7. Remove all surrounding materials that can react or compound with the spill.

In addition to the spill control and response procedures described in this HASP, Langan personnel will coordinate with the designated project manager relative to spill response and control actions. Notification to the Project Manager must be immediate and, to the extent possible, include the following information:

- Time and location of the spill.
- Type and nature of the material spilled.

- Amount spilled.
- Whether the spill has affected or has a potential to affect a waterway or sewer.
- A brief description of affected areas/equipment.
- Whether the spill has been contained.
- Expected time of cleanup completion. If spill cleanup cannot be handled by Langan's on-site personnel alone, such fact must be conveyed to the Project Manager immediately.

Langan shall not make any notification of spills to outside agencies. The client will notify regulatory agencies as per their reporting procedures.

### **16.15 Emergency Equipment**

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

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

### **16.16 Restoration and Salvage**

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers.
- Refilling medical supplies.
- Recharging eyewashes and/or showers.
- Replenishing spill control supplies.

### **16.17 Documentation**

Immediately following an incident or near miss, unless emergency medical treatment is required, either the employee or a coworker must contact the Langan Incident/Injury Hotline at 1-(800)-9-LANGAN (ext. #4699) and the client representative to report the incident or near miss. For emergencies involving personnel injury and/or exposure, the HSO and affected employee will complete and submit an Employee Exposure/Injury Incident Report (Attachment C) to the Langan Corporate Health and Safety Manager as soon as possible following the incident.

## **17.0 SPECIAL CONDITIONS**

This guideline contains information and requirements for special conditions that may not be

routinely encountered.

## **17.1 Scope**

The guideline applies to the specific projects identified within this document. Additional provisions will be addressed in each Site-Specific HASP, as needed.

## **17.2 Responsibilities**

Site Personnel - All site personnel must be alert to safety hazards on work sites and take action to minimize such hazards. Personnel must utilize the buddy system, watch for inappropriate behavior, and be alert to changes in site conditions.

Health and Safety Officer (HSO) - The HSO is responsible for considering these procedures in the development of site specific HASPs. The HSO shall schedule frequent "tail gate" safety briefings to enhance safety awareness and discuss potential problems.

## **17.3 Procedures**

The procedures outlined below shall be followed when such conditions are encountered.

### **17.3.1 Ladders**

Langan safety procedures shall be used to ensure employee safety when using ladders in the office or work sites. All ladders shall be coated or repaired to prevent injury to the employee from punctures or lacerations and to prevent snagging or clothing. Any wood ladders used must have an opaque covering except for identification or warning labels, which may be placed on one face only of a side rail.

#### *17.3.1.1 Ladder Use*

Employees shall only use ladders for the purposes, which they were designed and shall not be used as scaffolding. Ladders will be maintained and inspected prior to use for slip hazards including oil and grease. Employees shall use ladders only on stable and level surfaces unless the ladder is secured to prevent possible displacement. Ladders should not be used on slippery surfaces unless secured or provided with slip resistant feet to prevent accidental displacement. Ladders should not be used in locations where they could be displaced by workplace activities or traffic. Ladder rungs, cleats and steps shall be parallel, level and uniformly spaced when the ladder is in the use position.

Employees should not be carrying anything including equipment that could cause injury if there was a fall while utilizing the ladder. The top and bottom of the ladder area must remain clear while in use. When ascending and descending the ladder, employees must face the ladder.

Ladders shall not be loaded beyond the maximum intended load for which they were built or the manufacturer's rated capacity.

#### *17.3.1.2 Portable Ladders*

Rungs, cleats and steps for portable ladders and fixed ladders shall be spaced not less than 10 inches apart, nor more than 14 inches apart, as measured between center lines of the rungs, cleats and steps. When used to access an upper landing surface, the ladder side rails must extend at least three feet above the upper landing surface to which the ladder is used to gain access. If this is not possible, due to the ladders length, then the top of the ladder shall be secured at its top to a rigid support.

#### *17.3.1.3 Step Stools*

Rungs, cleats and steps of step stools shall not be less than 8 inches apart, nor more than 12 inches apart, as measured between center lines of the rungs, cleats and steps.

#### *17.3.1.4 Extension Ladders*

Rungs, cleats and steps of the base section of extension trestle ladders shall be spaced not less than 8 inches apart, nor more than 18 inches apart, as measured between center lines of the rungs, cleats and steps. The rung spacing on the extension section of the extension trestle ladder shall not be less than 6 inches nor more than 12 inches, as measured between center lines of the rungs, cleats and steps. Ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

#### *17.3.1.5 Inspection*

Ladders will be inspected for visible defects periodically, prior to utilization or after any occurrence that could have negatively affected the ladder. Portable ladders with defects including broken or missing rungs, cleats, or steps, broken or split rails, corroded components or other faulty or defective components shall not be used. The ladder will be immediately marked as defective, tagged as "Do Not Use" or blocked from being used and removed from service until repaired.

### **17.3.2 First Aid/Cardiopulmonary Resuscitation (CPR)**

Langan field and office personnel will be encouraged to be trained in First Aid and Cardiopulmonary Resuscitation (CPR). Training will be provided free of charge by Langan to all employees. Employees will receive a training certificate that will be kept on file with the Health & Safety Coordinator (HSC). Training and certification will be provided by a credited provider such as American Red Cross or equivalent.

#### *17.3.2.1 Emergency Procedures*

Prior to work at sites the Langan employees certified in first aid and CPR will be identified in the site specific HASP. Langan will endeavor to have at least one employee at a job site trained and able to render first aid and CPR. The site specific HASP will contain first aid information on both potential chemical and physical hazards. Emergency procedures to be followed in case of injury or illnesses are provided in the HASP. The HASP will include emergency contact information including local police and fire departments, hospital emergency rooms, ambulance services, on-site medical personnel and physicians. The HASP will also include directions and contact information to the nearest emergency facility in case immediate medical attention is required. The emergency contact information will be conspicuously posted at the worksite. Employees that are injured and require immediate medical attention shall call either 911 or the local posted emergency contacts. Employees should use ambulatory services to transport injured workers to the nearest facility for emergency medical care. In areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances shall be conspicuously posted.

#### *17.3.2.2 First Aid Supplies*

First aid supplies are readily available to all Langan employees when required. First aid kits are located in each Langan office. Portable first aid kits are available for employees to use at work sites. First aid kits should consist of items needed to treat employees for potential chemical and physical injuries. At a minimum, first aid kits should contain items to allow basic first aid to be rendered. Where the eyes or body of an employee may be exposed to corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use including eye wash.

First aid kits will be weatherproof with individual sealed packages of each item. All portable first aid kits shall be inspected by Langan employees before and after use to ensure all used items are replaced. When out in the field, employees shall check first aid kits weekly to ensure used items are replaced.

### **17.3.3 Hydrogen Sulfide**

Langan employees with the potential to be exposed to hydrogen sulfide while at work sites shall have training in hydrogen sulfide awareness. The training will include identification of areas where employees could be exposed to hydrogen sulfide, health effects, permissible exposure limits, and first aid procedures and personnel protective equipment. Langan employees could be exposed to hydrogen sulfide while at job sites including petroleum refineries, hazardous waste treatment, storage and disposal facilities, uncontrolled hazardous waste sites and remediation projects.

#### *17.3.3.1 Characteristics*

Hydrogen sulfide is a colorless gas with a strong odor of rotten eggs that is soluble in water. Hydrogen sulfide is used to test and make other chemicals. It is also found as a by-product of chemical reactions, such as in sewer treatment. It is a highly flammable gas and a dangerous fire hazard. Poisonous gases are produced in fires including sulfur oxides. Hydrogen sulfide is not listed as a carcinogen.

#### *17.3.3.2 Health Effects*

Hydrogen Sulfide can affect employees if inhaled or through contact with skin or eyes. Acute (or short term) health effects of hydrogen sulfide exposure include irritation of the nose and throat, dizziness, confusion, headache and trouble sleeping. Inhalation of hydrogen sulfide can irritate the lungs causing coughing and/or shortness of breath. Higher levels of exposure can cause build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.

Chronic (or long term) health effects of low levels of exposure to hydrogen sulfide can cause pain and redness of the eyes with blurred vision. Repeated exposure may cause bronchitis with cough, phlegm and shortness of breath.

#### *17.3.3.3 Protective Clothing and Equipment*

Respirators are required for those operations in which employees will be exposed to hydrogen sulfide above OSHA permissible exposure level. The maximum OSHA permissible exposure limit (PEL) for hydrogen sulfide is 20 parts of hydrogen sulfide vapor per million parts of air (20 ppm) for an 8-hour workday and the maximum short-term exposure limit (STEL) is 10 ppm for any 10-minute period.

Where employees are exposed to levels up to 100 parts of hydrogen sulfide vapor per million

parts of air (100 ppm), the following types of respiratory protection are allowed:

- Any powered, air purifying respirator with cartridge(s);
- Any air purifying, full-facepiece respirator (gas mask) with a chin style, front- or back-mounted canister;
- Any supplied air system with escape self-contained breathing apparatus, if applicable; and,
- Any self-contained breathing apparatus with a full facepiece.

Respirators used by employees must have joint Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) seal of approval. Cartridges or canisters must be replaced before the end of their service life, or the end of the shift, whichever occurs first. Langan employees that have the potential to be exposed to hydrogen sulfide will be trained in the proper use of respirators. Respirator training is discussed under– Langan’s Respiratory Protection Program.

Employees with potential exposure to hydrogen sulfide, or when required by the client, will wear a portable hydrogen sulfide gas detector. The detector should have an audible, visual and vibrating alarm. The detector may also provide detection for carbon monoxide, sulfur dioxide and oxygen deficient atmospheres. The hydrogen sulfide monitor will, at a minimum, be calibrated to detect hydrogen sulfide at a level of 20 parts of hydrogen sulfide vapor per million parts of air (20 ppm). Many portable gas detectors will have factory defaults with a low level alarm at 10 ppm and a high level alarm at 15 ppm. Langan employees shall consult clients to determine if any site specific threshold levels exist.

If the hydrogen sulfide gas detector sounds and employees are not wearing appropriate respiratory protection, employees must immediately vacate the area and meet at the assigned emergency location. Langan employees may not re- enter the site without proper respiratory protection and approval from the client or property owner, if needed.

Employees shall wear PPE to prevent eye and skin contact with hydrogen sulfide. Employees must wear appropriate protective clothing including boots, gloves, sleeves and aprons, over any parts of their body that could be exposed to hydrogen sulfide. Non-vented, impact resistant goggles should be worn when working with or exposed to hydrogen sulfide.

#### 17.3.3.4 *Emergency and First Aid Procedures*

##### **Eye and Face Exposure**

If hydrogen sulfide comes in contact with eyes, it should be washed out immediately with large



amounts of water for 30 minutes, occasionally lifting the lower and upper eye lids. Seek medical attention immediately.

### **Skin Exposure**

If hydrogen sulfide contaminates clothing or skin, remove the contaminated clothing immediately and wash the exposed skin with large amounts of water and soap. Seek medical attention immediately. Contaminated clothing should either be disposed of or washed before wearing again.

### **Breathing**

If a Langan employee or other personnel breathe in hydrogen sulfide, immediately get the exposed person to fresh air. If breathing has stopped, artificial respiration should be started. Call for medical assistance or a doctor as soon as possible.

### **Safety Precautions**

Hydrogen sulfide is a highly flammable gas and a dangerous fire hazard. Containers of hydrogen sulfide may explode in a fire situation. Poisonous gases are produced during fires.

Langan employees should contact property owners and operators prior to conducting work onsite to be aware of any site specific contingency plans, identify where hydrogen sulfide is used at the facility and be informed about additional safety rules or procedures.

#### **19.3.4 Fire Protection/Extinguishers**

Langan field personnel that have been provided with portable fire extinguishers for use at worksites will be trained to familiarize employees with general principles of fire extinguisher use and hazards associated with the incipient stage of firefighting. Training will be provided prior to initial assignment for field work and annually thereafter.

Portable fire extinguishers shall be visually inspected monthly and subjected to an annual maintenance check. Langan shall retain records of the annual maintenance date.

#### **17.3.5 Overhead lines**

When field work is performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before the work shall commence. If overhead lines are to be deenergized, arrangements shall be made with the client, property owner or

organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

When unqualified Langan personnel are working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object they may contact cannot come closer to any unguarded, energized overhead line than the following distances:

1. For voltages to ground 50kV or below - 10 feet; and
2. For voltages to ground over 50kV - 10 feet, plus 4 inches for every 10kV over 50kV.

As previously indicated, Langan does not retain qualified employees to perform work on energized equipment.

#### *17.3.5.1 Vehicle and Equipment Clearance*

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 feet is maintained. If the voltage of the overhead lines is higher than 50kV, the clearance shall be increased 4 inches for every 10kV over that voltage.

If any of the following discussed conditions occur, the clearance may be reduced.

- If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10 kV over that voltage.
- If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless the employee is using protective equipment rated for the voltage; or the equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the overhead line than permitted.

If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of

overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

### **17.3.6 Trade Secret**

Langan employees could potentially be provided trade secret information by the client or property owner when site specific information is provided about highly hazardous chemicals. Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Langan employees understand that this information should be kept confidential and if required, may enter into a confidentiality agreement with the client.

### **17.3.7 Bloodborne Pathogens**

Langan employees that can reasonably anticipate exposure to blood or other potentially infectious material while at work sites shall have training in bloodborne pathogens. Applicable employees would include those trained in first aid and serving a designated role as an emergency medical care provider. Bloodborne pathogens are pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus and human immunodeficiency virus.

#### *17.3.7.1 Training*

Langan employees with potential occupational exposure to blood or other potentially infectious material must participate in a training program. Training must be conducted prior to initial assignment where there would be potential for exposure and annually thereafter within one year of previous training. The training program will be provided to Langan employees at no cost to them and during working hours.

Langan will ensure the training program shall consist of the following:

- An accessible copy of the regulatory text of 29 CFR 1910.1030 and an explanation of its contents;
- A general explanation of the epidemiology and symptoms of bloodborne diseases;
- An explanation of the modes of transmission of bloodborne pathogens;
- An explanation of Langan's exposure control plan and the means by which the employee can obtain a copy of the written plan;

- An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;
- An explanation of the use and limitations of personal protective
  - equipment (PPE) to prevent and reduce exposure;
  - Information on the types, proper use, location, removal, handling and disposal of PPE;
  - An explanation of the basis for selection of PPE;
  - Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;
  - Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
  - An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;
  - Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;
  - An explanation of the signs and labels and/or color coding required by paragraph 29 CFR 1910.1030(g)(1); and
  - An opportunity for interactive questions and answers with the person conducting the training session.

Langan will develop and implement a written Exposure Control Plan, which will be designed to eliminate or minimize employee exposure to bloodborne pathogens. The Exposure Control Plan will contain the following elements:

- An exposure determination for employees;
- The schedule and method of implementation for Methods of Compliance (29 CFR 191.1030(d)), Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up (29 CFR 1910.1030(f)), Communication of Hazards to Employees (29 CFR 1910.1030(g)) and (h) Recordkeeping (29 CFR 1910.1030(h));
- The procedure for the evaluation of circumstances surrounding exposure incidents;
- Ensure a copy of the Exposure Control Plan will be accessible to employees; and,
- The Exposure Control Plan shall be reviewed and updated at least annually.

Langan employees with occupational exposure to bloodborne pathogens include any employees trained in first aid that would be expected to provide emergency medical care. This determination is made without regards to the use of PPE, which could eliminate or minimize exposure.

Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. According to the concept of Universal Precautions, all human blood and

certain human body fluids are treated as if known to be infectious for bloodborne pathogens. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

Work practice controls shall be used to eliminate or minimize employee exposure, if applicable. Since Langan employees will have occupational exposure only during rendering of first aid, personnel protective equipment will be utilized to reduce or minimize exposure. PPE that could be available to Langan personnel when administering first aid includes safety glasses, gloves, and Tyvek suits or sleeves. PPE and first aid kits will be provided to employees at no cost to them.

Langan employees that render first aid in office areas will have access to hand washing facilities or restrooms. For first aid rendered at field locations, first aid kits will contain an appropriate antiseptic hand cleanser and clean cloth/paper towels or antiseptic towelettes. After using antiseptic hand cleansers or towelettes, employees shall wash their hands with soap and running water as soon as feasible.

After administering first aid, potentially infectious materials, including towels, personnel protective equipment, clothes and bandages, shall be placed in a container, which prevents leakage during collection, handling, processing, storage, transport, or shipping. All PPE will be disposed of after use. Any equipment or working surfaces which was been exposed to blood or potentially infectious materials due to an injury, will be decontaminated prior to reuse.

Langan will make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation and follow-up to all employees who have had an exposure incident. These services will be available to the employee at no cost to them through a medical provider.

#### *17.3.7.2 Recordkeeping*

Langan will maintain training and medical records for each employee with occupational exposure to blood or potentially infectious materials. Medical and training records will be maintained by Langan's H&S Department.

Training records will include the following:

- Dates of the training sessions;
- Contents or a summary of the training sessions;
- Names and qualifications of persons conducting the training; and
- Names and job titles of all persons attending the training sessions.

Training records shall be maintained for 3 years from the date on which the training occurred. Medical records will be will be preserved and maintained for the duration of employment plus 30 years.

All records will be made available upon request to employees, the Assistant Secretary of Labor for Occupational Safety and Health, and Director of National Institute for Occupational Safety and Health Director of OSHA for examination and copying. Medical records must have written consent from employee before releasing.

If Langan ceases to do business, all records shall be transferred to the successor employer. The successor employer shall receive and maintain these records.

If there will not be a successor, Langan will notify current employees of their rights to access records at least three months prior to the cessation of business.

## **18.0 RECORDKEEPING**

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

### **18.1 Field Change Authorization Request**

Any changes to the work to be performed that is not included in the HASP will require an addendum that is approved by the Langan project manager and Langan HSM to be prepared. Approved changes will be reviewed with all field personnel at a safety briefing.

### **18.2 Medical and Training Records**

Copies or verification of training (40-hour, 8-hour, supervisor, site-specific training, documentation of three-day OJT, and respirator fit-test records) and medical clearance for site work and respirator use will be maintained in the office and available upon request. Records for all subcontractor employees must also be available upon request. All employee medical records will be maintained by the HSM.

### **18.3 Onsite Log**

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

### **18.4 Daily Safety Meetings (“Tailgate Talks”)**

Completed safety briefing forms will be maintained by the HSO.

### **18.5 Exposure Records**

All personal monitoring results, laboratory reports, calculations and air sampling data sheets are part of an employee exposure record. These records will be maintained by the HSO during site work. At the end of the project they will be maintained according to 29 CFR 1910.1020.

## **18.6 Hazard Communication Program/MSDS-SDS**

Material safety data sheets (MSDS) of Safety Data Sheets (SDS) have been obtained for applicable substances and are included in this HASP (Attachment D). Langan's written hazard communication program, in compliance with 29 CFR 1910.1200, is maintained by the HSM.

## **18.7 Documentation**

Immediately following an incident or near miss, unless emergency medical treatment is required, either the employee or a coworker must contact the Langan incident/injury hotline at 1-800-952-6426, extension 4699 and the Project Manager to report the incident or near miss. The Project Manager will contact the client or client representative. A written report must be completed and submitted HSM within 24 hours of the incident. For emergencies involving personnel injury and/or exposure, employee will complete and submit the Langan incident/injury report to the Langan corporate health and safety manager as soon as possible following the incident. Accidents will be investigated in-depth to identify all causes and to recommend hazard control measures.

### **18.7.1 Accident and Injury Report Forms**

#### *18.7.1.1 Accident/Incident Report*

All injuries, no matter how slight, shall be reported to the FTL and the PM immediately. The accident/incident report forms, attached in Attachment U and Attachment V will be filled out on all accidents by the applicable contractor supervision personnel, the FTL, or the HSO. Copies of all accident/incident reports shall be kept on-site and available for review. Project personnel will be instructed on the location of the first aid station, hospital, and doctor and ambulance service near the job. The emergency telephone numbers will be conspicuously posted in site vehicles near the work zone. First aid supplies will be centrally located and conspicuously posted between restricted and non-restricted areas to be readily accessible to all on the site.

#### *18.7.1.2 First Aid Treatment Record*

The forms in will be used for recording all non-lost time injuries treated by the project first-aid attendant, the local physician or hospital will be entered in detail on this record. "Minor" treatment of scratches, cuts, etc. will receive the same recording attention as treatment of more severe injuries.

### 18.7.1.3 OSHA Form 300

An OSHA Form 300 will be kept at the Langan Corporate Office in Parsippany, New Jersey. All recordable injuries or illnesses will be recorded on this form. Subcontractor employers must also meet the requirements of maintaining an OSHA 300 form. The Incident Report form used to capture the details of work-related injuries/illnesses meets the requirements of the OSHA Form 301 (supplemental record) and must be maintained with the OSHA Form 300 for all recordable injuries or illnesses. Forms for recording OSHA work-related injuries and illnesses are included in Attachment U and Attachment V.

## 19.0 CONFINED SPACE ENTRY

Confined spaces are not anticipated at the Site during planned construction activities. If confined spaces are identified, the contractor must implement their own confined space program that all applicable federal, state and local regulations. Confined spaces **will not** be entered by Langan personnel.

## 20.0 HASP ACKNOWLEDGEMENT FORM

All Langan personnel and contractors will sign this HASP Compliance Agreement indicating that they have become familiar with this HASP and that they understand it and agree to abide by it.





<b>Printed Name</b>	<b>Signature</b>	<b>Company</b>	<b>Date</b>

## TABLES

**TABLE 1  
TASK HAZARD ANALYSES**

<b>Task</b>	<b>Hazard</b>	<b>Description</b>	<b>Control Measures</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Contaminated Soil or Groundwater- Dermal Contact	Contaminated water spills on skin, splashes in eyes; contact with contaminated soil/fill during construction activities or sampling.	Wear proper PPE; follow safe practices, maintain safe distance from construction activities	See Table 2, seek medical attention as required
1.3.1 – 1.3.8	Lacerations, abrasions, punctures	Cutting bailer twine, pump tubing, acetate liners, etc. with knife; cuts from sharp site objects or previously cut piles, tanks, etc.; Using tools in tight spaces	Wear proper PPE; follow safe practices	Clean wound, apply pressure and/or bandages; seek medical attention as required.
1.3.1 – 1.3.8	Contaminated Media Inhalation	Opening drums, tanks, wells; vapors for non-aqueous phase liquids or other contaminated site media; dust inhalation during excavation; vapor accumulation in excavation	Follow air monitoring plan; have quick access to respirator, do not move or open unlabeled drums found at the site, maintain safe distance from construction activities	See Table 2, seek medical attention as required
1.3.1 – 1.3.8	Lifting	Improper lifting/carrying of equipment and materials causing strains	Follow safe lifting techniques; Langan employees are not to carry contractor equipment or materials	Rest, ice, compression, elevation; seek medical attention as required
1.3.1 – 1.3.8	Slips, trips, and falls	Slips, trips and falls due to uneven surfaces, cords, steep slopes, debris and equipment in work areas	Good housekeeping at site; constant awareness and focus on the task; avoid climbing on stockpiles; maintain safe distance from construction activities and excavations; avoid elevated areas over six feet unless fully accredited in fall protection and wearing an approved fall protection safety apparatus	Rest, ice, compression, elevation; seek medical attention as required
1.3.1 – 1.3.8	Noise	Excavation equipment, hand tools, drilling equipment.	Wear hearing protection; maintain safe distance from construction activities	Seek medical attention as required
1.3.1 – 1.3.8	Falling objects	Soil material, tools, etc. dropping from drill rigs, front-end loaders, etc.	Hard hats to be worn at all times while in work zones; maintain safe distance from construction activities and excavations	Seek medical attention as required
1.3.1 – 1.3.8	Underground/ overhead utilities	Excavation equipment, drill rig auger makes contact with underground object; boom touches overhead utility	"One Call" before dig; follow safe practices; confirm utility locations with contractor; wear proper PPE; maintain safe distance from construction activities and excavations	Seek medical attention as required
1.3.1 – 1.3.8	Insects (bees, wasps, hornet, mosquitoes, and spider)	Sings, bites	Insect Repellent; wear proper protective clothing (work boots, socks and light colored pants);field personnel who may have insect allergies (e.g., bee sting) should provide this information to the HSO or FSO prior to commencing work, and will have allergy medication on site.	Seek medical attention as required
1.3.1 – 1.3.8	Vehicle traffic / Heavy Equipment Operation	Vehicles unable to see workers on site, operation of heavy equipment in tight spaces, equipment failure, malfunctioning alarms	Wear proper PPE, especially visibility vest; use a buddy system to look for traffic; rope off area of work with cones and caution tape or devices at points of hazard, maintain safe distance from construction activities and equipment	Seek medical attention as required

**TABLE 2  
CONTAMINANT HAZARDS OF CONCERN**

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	1,1'-Biphenyl 1,1-Biphenyl Biphenyl Phenyl benzene Diphenyl	92-52-4	None	1 mg/m <sup>3</sup> 100 mg/m <sup>3</sup>	Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, throat; headache, nausea, lassitude (weakness, exhaustion), numb limbs; liver damage	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	1,1-Dichloroethane Asymmetrical dichloroethane Ethylidene chloride 1,1-Ethylidene dichloride 1,1-DCA	75-34-3	PID	100 ppm 3000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the skin; central nervous system depression; liver, kidney, lung damage	Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	1,2,3-Trichloropropane Allyl trichloride Glycerol trichlorohydrin Glyceryl trichlorohydrin Trichlorohydrin	96-18-4	PID	50 ppm 100 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, nose, throat; central nervous system depression; In Animals: liver, kidney injury; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	1,2,4,5-Tetramethylbenzene Durene	95-93-2	NA	None None	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	1,2,4-Trimethylbenzene	95-63-6	PID	None None	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	1,2-Dichloroethane Ethylene dichloride 1,2-DCA DCE[1] Ethane dichloride Dutch liquid, Dutch oil Freon 150 Glycol dichloride	107-06-2	PID	1 ppm 50 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin absorption, skin and/or eye contact	irritation to the eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	1,2-Dichloroethene 1,2-Dichloroethylene 1,2-DCE trans-1,2-Dichloroethylene Total 1,2-Dichloroethene cis-1,2-Dichloroethylene mixture of cis and trans Acetylene dichloride cis-Acetylene dichloride sym-Dichloroethylene cis-1,2-Dichloroethene cDCE 1,1-dimethyl-;dimethyl1,1- cyclohexane sym-Dichloroethylene Dichloroethylenes trans-1 2-Dichloroethene	159-59-2 156-60-5 156-60-2 540-59-0	PID	200 ppm 4000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	Irritant to eyes, skin, mucous membranes and respiratory system. May be harmful by ingestion, skin absorption and inhalation	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	1,3,5-Trimethylbenzene Mesitylene sym-Trimethylbenzene	108-67-8	PID	None None	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	1,3-Butadiene Biethylene Bivinyll Butadiene Divinyl Erythrene Vinylethylene	106-99-0	PID	1 ppm 2000 ppm	Vapor	inhalation, skin and/or eye contact (liquid)	irritation to the eyes, nose, throat; drowsiness, dizziness; liquid: frostbite; teratogenic, reproductive effects; [potential occupational carcinogen]	Eye: Frostbite Skin: Frostbite Breathing: Respiratory support

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	1,4-Dioxane 1,4-Dioxacyclohexane [1,4]Dioxane p-Dioxane [6]-crown-2 Diethylene dioxide Diethylene ether Dioxan Dioxane 1,4-Dioxane	123-91-1	PID	100 ppm 500 ppm	Groundwater Soil Vapor	Inhalation, ingestion, skin and/or eye contact	Irritant to eyes, skin, mucous membranes and respiratory system. May be harmful by ingestion, skin absorption and inhalation	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	2,2,4-Trimethylpentane Isooctane	540-84-1	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	2,4-Dimethylphenol 2,4-Xylenol m-Xylenol 1-Hydroxy-2,4- dimethylbenzene 2,4-Dimethylphenol 4-Hydroxy-1,3- dimethylbenzene 4,6-Dimethylphenol 1,3-Dimethyl-4-hydroxybenze	105-67-9	None	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; headache, narcosis, coma; dermatitis; in animals: liver, kidney damage	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	2,4-dinitrotoluene	121-14-2	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	Irritation to the eyes, skin, respiratory system, Blue lips or finger nails. Blue skin. Headache. Dizziness. Nausea. Confusion. Convulsions. Unconsciousness	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately



<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	2-Butanone Ethyl methyl ketone MEK Methyl acetone Methyl ethyl ketone	78-93-3	PID	200 ppm 3000 ppm	Soil Groundwater Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eye: Irrigate immediately Skin: Water wash immediately Breathing: Fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.8	2-Hexanone Butyl methyl ketone MBK Methyl butyl ketone Methyl n-butyl ketone	591-78-6	PID	100 ppm 1600 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose; peripheral neuropathy: lassitude (weakness, exhaustion), paresthesia; dermatitis; headache, drowsiness	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	2-Methylnaphthalene β-methylnaphthalene	91-57-6	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion or skin absorption, eye contact	irritation to the skin, eyes, mucous membranes and upper respiratory tract. It may also cause headaches, nausea, vomiting, diarrhea, anemia, jaundice, euphoria, dermatitis, visual disturbances, convulsions and comatose	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

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1.3.1 – 1.3.8	4-Isopropyltoluene 1-Methyl-4-(1-methylethyl)benzene 4-Isopropyltoluene; 4-Methylcumene; 1-Methyl-4-isopropylbenzene Dolcymene Camphogen Paracymene Cymene p-Cymene p-Isopropyltoluene	99-87-6	PID	NA NA	Soil Groundwater Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	4-Methyl-2-pentanone Hexone Isobutyl methyl ketone Methyl isobutyl ketone MIBK	108-10-1	PID	100 ppm 500 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; headache, narcosis, coma; dermatitis; in animals: liver, kidney damage	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Acenaphthene 1,2-Dihydroacenaphthylene 1,8-Ethylenenaphthalene peri-Ethylenenaphthalene Naphthyleneethylene Tricyclododecapentaene	83-32-9	PID	NA NA	Soil	inhalation, ingestion, skin and/or eye contact,	irritation to the skin, eyes, mucous membranes and upper respiratory tract; If ingested, it can cause vomiting	Eye: Irrigate immediately Skin: Soap wash immediately, if redness or irritation develop, seek medical attention immediately Breathing: Move to fresh air Swallow: do not induce vomiting, seek medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Acenaphthylene Cycopental(de)naphthalene, Acenaphthalene	208-96-8	PID	NA NA	Soil	inhalation, ingestion, skin and/or eye contact	irritation to the skin, eyes, mucous membranes and upper respiratory tract	Eye: Irrigate immediately, seek medical attention immediately, Skin: Soap wash immediately, if redness or irritation develop, seek medical attention immediately Breathing: Move to fresh air Swallow: do not induce vomiting, seek medical attention immediately
1.3.1 – 1.3.8	Acetone Dimethyl ketone Ketone propane 2-Propanone	67-64-1	PID	1000 ppm 2500 ppm	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

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1.3.1 – 1.3.8	Acetophenone 1-phenylethanone Methyl phenyl ketone Phenylethanone	98-86-2	None	NA NA	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the skin, eyes, mucous membranes and upper respiratory tract	Eye: Irrigate immediately, seek medical attention immediately, Skin: Soap wash immediately, if redness or irritation develop, seek medical attention immediately Breathing: Move to fresh air Swallow: do not induce vomiting, seek medical attention immediately
1.3.1 – 1.3.8	Anthracene	120-12-7	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to the skin, eyes, mucous membranes and upper respiratory tract, abdominal pain if ingested.	Eye: Irrigate immediately, seek medical attention immediately, Skin: Soap wash immediately, Breathing: Move to fresh air, refer to medical attention; Swallow: refer to medical attention
1.3.1 – 1.3.8	Benzene Benzol Phenyl hydride Alkyl benzene isomers	71-43-2	PID	3.19 mg/m <sup>3</sup> 1,595 mg/mg <sup>3</sup>	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; lassitude (weakness, exhaustion) [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.8	Benzo(a)anthracene Benzanthracene Benzanthrene 1,2-Benzanthracene Benzo[b]phenanthrene Tetraphene	56-55-3	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	dermatitis, bronchitis, [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Benzo(a)pyrene	50-32-8	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	dermatitis, bronchitis, [potential occupational carcinogen]	Eye: Irrigate immediately, seek medical attention Skin: Soap wash immediately; Breathing: move to fresh air; Swallow: Induce vomiting if conscious, seek medical attention immediately
1.3.1 – 1.3.8	Benzo(b)fluoranthene	205-99-2	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately

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1.3.1 – 1.3.8	Benzo(g,h,i)perylene Benzo(ghi)perylene	191-24-2	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	NA	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.8	Benzo(k)fluoranthene	207-08-9	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation (dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.8	Benzoic acid Carboxybenzene E210 Dracylic acid Phenylmethanoic acid Benzenecarboxylic acid Benzoic acid isomer	65-85-0	None	NA NA	Groundwater Soil Vapor	inhalation, skin or eye contact, ingestion	irritation to eyes with possible eye damage, skin causing rash, redness or burning, irritation to nose, throat and lungs	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air
1.3.1 – 1.3.8	Benzyl butyl phthalate Butyl benzyl phthalate Butylbenzylphthalate	86-66-7	None	NA NA	Groundwater Soil Vapor	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation (dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately

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1.3.1 – 1.3.8	Bis(2-ethylhexyl)phthalate Bis(2-Ethylhexyl) Phthalate Di-sec octyl phthalate DEHP Di(2-ethylhexyl)phthalate Octyl phthalate bis(2-ethylexyl)phthalate	117-81-7	None	5 mg/m <sup>3</sup> 5000 mg/m <sup>3</sup>	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, mucous membrane; in animals: liver damage; teratogenic effects; [potential occupational carcinogen	Eye: Irrigate immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Carbazole 9-azafluorene Dibenzopyrrole Diphenylenimine diphenyleneimide	86-74-8	None	NA NA	Soil	inhalation, skin absorption (liquid), skin and/or eye contact	irritation to eyes and skin, respiratory irritation	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.8	Carbon disulfide	75-15-0	PID	20 ppm 500 ppm	Soil Groundwater Vapor	inhalation, skin or eye contact, ingestion	irritation to the eyes, skin, respiratory system	Eye: Irrigate immediately (liquid) Skin: Water flush immediately (liquid) Breathing: Respiratory support
1.3.1 – 1.3.8	Carbon tetrachloride Carbon chloride Carbon tet Freon® 10 Halon® 104 Tetrachloromethane	56-23-5	PID	10 ppm 200 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; central nervous system depression; nausea, vomiting; liver, kidney injury; drowsiness, dizziness, incoordination; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

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1.3.1 – 1.3.8	Chloroform Methane trichloride Trichloromethane Chloro-3-methyl phenol	67-66-3	None	50 ppm 500 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Chrysene Benzo[a]phenanthrene 1,2-Benzphenanthrene	218-01-9	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Groundwater Soil	inhalation, absorption, ingestion, consumption	irritation to eye, skin, and respiratory, gastrointestinal irritation nausea, vomit, diarrhea [potential occupational carcinogen]	Eyes: Irrigate immediately Skin: Soap wash promptly. Breath: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	cis-1,2-Dichloroethylene cis-1,2-Dichloroethene	156-59-2	NA	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	Irritant to eyes, skin, mucous membranes and respiratory system. May be harmful by ingestion, skin absorption and inhalation	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Cumene Cumol Isopropylbenzene 2-Phenyl propane 1-methylethy lbenzene Isopropyl Benzene	98-82-8	PID	50 ppm 900 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately



<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Cyclohexane Benzene hexahydride Hexahydrobenzene Hexamethylene Hexanaphthene	110-82-7	PID	300 ppm 1300 ppm	Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, respiratory system; drowsiness; dermatitis; narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Dibenz(a,h)anthracene Dibenzo(a,h)anthracene Dibenzo[a,h]anthracene	53-70-3	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Groundwater Soil	inhalation, absorption, ingestion, consumption	irritation to eyes, skin, respiratory, and digestion [potential occupational carcinogen]	Eyes: Irrigate immediately Skin: Soap wash promptly. Breath: Respiratory support PID Swallow: Medical attention immediately
1.3.1 – 1.3.8	Dibenzofuran	132-64-9	None	NA NA	Soil	inhalation, absorption	irritation to eyes, and skin	Eyes: Irrigate immediately Skin: Soap wash promptly.
1.3.1 – 1.3.8	Dibutyl phthalate Di-n-butyl phthalate Butyl phthalate n-Butyl phthalate 1,2-Benzenedicarboxylic acid dibutyl ester o-Benzenedicarboxylic acid dibutyl ester DBP Palatinol C, Elaol Dibutyl-1,2-benzene- dicarboxylate Di-n-butylphthalate	84-74-2	None	5 mg/m <sup>3</sup> 4000 mg/m <sup>3</sup>	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, upper respiratory system, stomach	Eye: Irrigate immediately Skin: Wash regularly Breathing: Respiratory support Swallow: Medical attention immediately

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1.3.1 – 1.3.8	Dichlorodifluoromethane Difluorodichloromethane, Fluorocarbon 12 Freon 12 Freon® 12 Genetron® 12 Halon® 122 Propellant 12 Refrigerant 12 Dichlorodifluoromethane	75-71-8	None	1000 pp, 15,000 ppm	Groundwater Soil Vapor	inhalation, skin and/or eye contact (liquid)	dizziness, tremor, asphyxia, unconsciousness, cardiac arrhythmias, cardiac arrest; liquid: frostbite	Eye: Frostbite Skin: Frostbite Breathing: Respiratory support
1.3.1 – 1.3.8	Diesel Fuel automotive diesel fuel oil No. 2 distillate diesoline diesel oil diesel oil light diesel oil No. 1-D summer diesel	68334- 30-5	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Ethanol Absolute alcohol Alcohol cologne spirit drinking alcohol ethane monoxide ethyl alcohol EtOH ethyl alcohol ethyl hydrate ethyl hydroxide ethylol grain alcohol hydroxyethane methylcarbinol	64-17-5	PID	1000 ppm 3300 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose; headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; liver damage; anemia; reproductive, teratogenic effects	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Fresh air Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Ethyl acetate Acetic ester Acetic ether Ethyl ester of acetic acid Ethyl ethanoate	141-78-6	PID	400 ppm 2000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation eyes, skin, nose, throat; narcosis; dermatitis	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Ethyl benzene Ethylbenzene Ethylbenzol Phenylethane	100-41-4	PID	435 mg/m <sup>3</sup> 3,472 mg/m <sup>3</sup>	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Ethyl chloride Chloroethane Hydrochloric ether Monochloroethane Muriatic ether Hydrochloric ether	75-00-3	PID	1000 ppm 3800 ppm	Groundwater Soil Vapor	inhalation, skin absorption (liquid), ingestion (liquid), skin and/or eye contact	incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Fluoranthene Benzo(j,k)fluorene	206-44-0	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Fluorene	86-73-7	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention
1.3.1 – 1.3.8	Fuel Oil No. 2	68476-30-2	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Gasoline	8006-61-9	PID	NA NA	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Helium	7440-59-7	Helium Detector	NA NA	NA	inhalation	dizziness, headache, and nausea	Breathing: Respiratory support

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1.3.1 – 1.3.8	Heptane n-Heptane	142-82-5	PID	500 ppm 750 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	dizziness, stupor, incoordination; loss of appetite, nausea; dermatitis; chemical pneumonitis (aspiration liquid); unconsciousness	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Indeno(1,2,3-cd)pyrene Indeno(1,2,3-c,d)Pyrene Indeno[1,2,3-cd]Pyrene	193-39-5	None	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Groundwater Soil	inhalation, absorption, ingestion, consumption	irritation to eyes, skin, respiratory, and digestion [potential occupational carcinogen]	Eyes: Irrigate immediately Skin: Soap wash promptly. Breath: Respiratory support Swallow: Medical attention immediately, wash mouth with water
1.3.1 – 1.3.8	Isopropyl alcohol Iso-Propyl Alcohol Carbinol IPA Isopropanol 2-Propanol sec-Propyl alcohol Rubbing alcohol Isopropylalcohol	67-63-0	PID	400 ppm 2000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; drowsiness, dizziness, headache; dry cracking skin; in animals: narcosis	Eye: Irrigate immediately Skin: Water flush Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.8	m-Cresol meta-Cresol 3-Cresol m-Cresylic acid 1-Hydroxy-3-methylbenzene 3-Hydroxytoluene 3-Methylphenol	108-39-4	PID	5 ppm 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Methyl Chloride Chloromethane Monochloromethane Refrigerant-40 R-40	74-87-3	NA	100 ppm 2000 ppm	Groundwater Soil	inhalation, skin and/or eye contact	dizziness, nausea, vomiting; visual disturbance, stagger, slurred speech, convulsions, coma; liver, kidney damage; liquid: frostbite; reproductive, teratogenic effects; [potential occupational carcinogen]	Eye: Frostbite Skin: Frostbite Breathing: Respiratory support
1.3.1 – 1.3.8	Methyl <i>tert</i> -butyl ether MTBE Methyl tertiary-butyl ether Methyl t-butyl ether <i>tert</i> -Butyl methyl ether tBME <i>tert</i> -BuOMe Methyl <i>tert</i> butyl ether	1634-04-4	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

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1.3.1 – 1.3.8	Methylcyclohexane Methyl cyclohexane Methylcyclohexane Hexahydrotoluene Cyclohexylmethane Toluene hexahydride	108-87-2	PID	500 ppm 1200 ppm	Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, drowsiness; in animals: narcosis	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Methylene Chloride Dichloromethane Methylene dichloride	75-09-2	PID	25 ppm 2300 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numb, tingle limbs; nausea; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	m-Xylenes 1,3-Dimethylbenzene m-Xylol Metaxylene	108-38-3  179601- 23-1	PID	100 ppm 900 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Naphthalene Naphthalin Tar camphor White tar	91-20-3	PID	50 mg/m <sup>3</sup> 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; hematuria (blood in the urine); dermatitis, optical neuritis	Eye: Irrigate immediately Skin: Molten flush immediately/solid- liquid soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	n-Butylbenzene Butylbenzene 1-phenylbutane	104-51-8	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin; dry nose, throat; headache; low blood pressure, tachycardia, abnormal cardiovascular system stress; central nervous system, hematopoietic depression; metallic taste; liver, kidney injury	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	n-Hexane Hexane, Hexyl hydride, normal-Hexane	110-54-3	PID	500 ppm 1100 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose; nausea, headache; peripheral neuropathy: numb extremities, muscle weak; dermatitis; dizziness; chemical pneumonitis (aspiration liquid)	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately



<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Non-Flammable Gas Mixture CALGAS (Equipment Calibration Gas : Oxygen Methane Hydrogen Sulfide Carbon Monoxide Nitrogen	7782-44- 7 74-82-8 7783-08- 4 830-08-0 7727-37- 9	Multi-Gas PID	NA/NA NA/NA 10/100 ppm 50/1200 ppm NA/NA	NA	inhalation	dizziness, headache, and nausea	Breathing: Respiratory support
1.3.1 – 1.3.8	Non-Flammable Gas Mixture CALGAS (Equipment Calibration Gas : Oxygen Isobutylene Nitrogen	7782-44- 7 115-11-7 7727-37- 9	PID	NA/NA NA/NA NA/NA	NA	inhalation	dizziness, headache, and nausea	Breathing: Respiratory support
1.3.1 – 1.3.8	n-Propylbenzene Isocumene Propylbenzene 1-Phenylpropane 1-Propylbenzene Phenylpropane Propylbenzene-n	103-65-1	PID	NA NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin; dry nose, throat; headache; low blood pressure, tachycardia, abnormal cardiovascular system stress; central nervous system, hematopoietic depression; metallic taste; liver, kidney injury	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	o-Cresol ortho-Cresol 2-Cresol o-Cresylic acid 1-Hydroxy-2-methylbenzene 2-Hydroxytoluene 2-Methyl phenol 2-Methylphenol	95-48-7	PID	5 ppm 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately hhhhhhhhh
1.3.1 – 1.3.8	o-Xylenes 1,2-Dimethylbenzene ortho-Xylene o-Xylo	95-47-6 179601-23-1	PID	100 ppm 900 ppm	Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	p-Cresol para-Cresol 4-Cresol p-Cresylic acid 1-Hydroxy-4-methylbenzene 4-Hydroxytoluene 4-Methylphenol	106-44-5	PID	5 ppm 250 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.8	p-Diethylbenzene 1,4-Diethylbenzene 1,4-Diethyl benzene	105-05-5	PID	None None	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, respiratory system; skin burns; in animals: central nervous system depression	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Pentachlorophenol PCP; Penta; 2,3,4,5,6-Pentachlorophenol	87-86-5	PID	0.5 mg/m <sup>3</sup> 2.5 mg/m <sup>3</sup>	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; sneezing, cough; lassitude (weakness, exhaustion), anorexia, weight loss; sweating; headache, dizziness; nausea, vomiting; dyspnea (breathing difficulty), chest pain; high fever; dermatitis	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	p-Ethyltoluene 4-Ethyltoluene 1-ethyl-4-methyl-benzene 1-methyl-4-ethylbenzene	622-96-8	NA	NA NA	Soil	ingestion, skin and/or eye contact	irritation to the eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Phenanthrene	85-01-8	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Phenol Carbolic acid Hydroxybenzene, Monohydroxybenzene Phenyl alcohol Phenyl hydroxide	108-95-2	PID	5 ppm 250 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine, skin burns; dermatitis; tremor, convulsions, twitching	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Propylene Propene Methyl ethylene	115-07-1	PID	NA NA	Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat, skin burns asphyxiation	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	p-Xylenes 1,4-Dimethylbenzene para-Xylene p-Xylol	106-42-3	PID	100 ppm 900 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Pyrene benzo[def]phenanthrene	129-00-0	PID	0.2 mg/m <sup>3</sup> 80 mg/m <sup>3</sup> (Coal Pitch Tar)	Groundwater Soil	inhalation, skin or eye contact, ingestion	irritation to eyes and skin, respiratory irritation(dizziness, weakness, fatigue, nausea, headache)	Eye: Irrigate immediately, refer to medical attention Skin: Soap wash immediately Breathing: move to fresh air Swallow: Medical attention immediately
1.3.1 – 1.3.8	sec-Butylbenzene 2-phenylbutane	135-98-8	PID	10 ppm 100 ppm	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, throat; inhalation: nausea or vomiting	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Styrene Ethenyl benzene Phenylethylene Styrene monomer Styrol Vinyl benzene	100-42-5	PID	100 ppm 700 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose, respiratory system; headache, lassitude (weakness, exhaustion), dizziness, confusion, malaise (vague feeling of discomfort), drowsiness, unsteady gait; narcosis; defatting dermatitis; possible liver injury; reproductive effects	Eye: Irrigate immediately Skin: Water flush Breathing: Respiratory support Swallow: Medical attention immediately

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Tert-Butyl Alcohol Tertiary Butyl Alcohol Tert-Butanol Butyl alcohol 2-Methyl-2-propanol Trimethyl carbinol TBA	75-65-0	PID	100 ppm 1600 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; drowsiness, narcosis	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	tert-Butylbenzene t-Butylbenzene 2-Methyl-2-phenylpropane Pseudobutylbenzene	98-06-6	PID	10 ppm NA	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	eye, skin irritation; dry nose, throat; headaches; low blood pressure, tachycardia; abnormal cardiovascular system; central nervous system depression; hematopoietic depression	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Tetrachloroethylene Perchloroethylene Perchloroethylene PCE Perk Tetrachloroethylene Tetrachloroethene	127-18-4	PID	100 ppm 150 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Tetrahydrofuran Diethylene oxide 1,4-Epoxybutane Tetramethylene oxide THF	109-99-9	PID	200 ppm 2000 ppm	Groundwater Soil Vapor	inhalation, skin and/or eye contact, ingestion	irritation to the eyes, upper respiratory system; nausea, dizziness, headache, central nervous system depression	Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immedi

<b>Task</b>	<b>Contaminant</b>	<b>CAS Number</b>	<b>Monitoring Device</b>	<b>PEL/IDLH</b>	<b>Source of Concentration on Site</b>	<b>Route of Exposure</b>	<b>Symptoms</b>	<b>First Aid</b>
1.3.1 – 1.3.8	Toluene Methyl benzene Methyl benzol Phenyl methane Toluol	108-88-3	PID	200 ppm 500 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, paresthesia; dermatitis	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Total Xylenes Dimethylbenzene Xylol	1330-20-7	PID	100 ppm 900 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; nausea, vomiting, abdominal pain; dermatitis	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Trichloroethylene Trichloroetheneylenes Ethylene trichloride TCE Trichloroethene Trilene	79-01-6	PID	100 ppm 1000 ppm	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Task	Contaminant	CAS Number	Monitoring Device	PEL/IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.8	Trichlorofluoromethane Fluorotrichloromethane Freon® 11 Monofluorotrichloromethane Refrigerant 11 Trichloromonofluoromethane Freon 11	75-69-4	PID	1000 ppm 2000 ppm	Groundwater Soil Vapor	inhalation, ingestion, skin and/or eye contact	incoordination, tremor; dermatitis; cardiac arrhythmias, cardiac arrest; asphyxia; liquid: frostbite	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.8	Vinyl Chloride Chloroethene Chloroethylen Ethylene monochloride Monochloroethene Monochloroethylene VC  Vinyl chloride monomer (VCM)	75-01-4	PID	1 ppm NA	Groundwater Soil Vapor	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]	Eye: Frostbite Skin: Frostbite Breathing: Respiratory support

#### EXPLANATION OF ABBREVIATIONS

PID = Photoionization Detector

PEL = Permissible Exposure Limit (8-hour Time Weighted Average)

IDLH = Immediately Dangerous to Life and Health

ppm = part per million

mg/m<sup>3</sup> = milligrams per cubic meter



**TABLE 3**  
**Summary of Monitoring Equipment**

Instrument	Operation Parameters
Photoionization Detector (PID)	<p><b>Hazard Monitored:</b> Many organic and some inorganic gases and vapors.</p> <p><b>Application:</b> Detects total concentration of many organic and some inorganic gases and vapors. Some identification of compounds is possible if more than one probe is measured.</p> <p><b>Detection Method:</b> Ionizes molecules using UV radiation; produces a current that is proportional to the number of ions.</p> <p><b>General Care/Maintenance:</b> Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories.</p> <p><b>Typical Operating Time:</b> 10 hours. 5 hours with strip chart recorder.</p>
Oxygen Meter	<p><b>Hazard Monitored:</b> Oxygen (O<sub>2</sub>).</p> <p><b>Application:</b> Measures the percentage of O<sub>2</sub> in the air.</p> <p><b>Detection Method:</b> Uses an electrochemical sensor to measure the partial pressure of O<sub>2</sub> in the air, and converts the reading to O<sub>2</sub> concentration.</p> <p><b>General Care/Maintenance:</b> Replace detector cell according to manufacturer's recommendations. Recharge or replace batteries prior to expiration of the specified interval. If the ambient air is less than 0.5% C O<sub>2</sub>, replace the detector cell frequently.</p> <p><b>Typical Operating Time:</b> 8 – 12 hours.</p>
Additional equipment (if needed, based on site conditions)	
Combustible Gas Indicator (CGI)	<p><b>Hazard Monitored:</b> Combustible gases and vapors.</p> <p><b>Application:</b> Measures the concentration of combustible gas or vapor.</p> <p><b>Detection Method:</b> A filament, usually made of platinum, is heated by burning the combustible gas or vapor. The increase in heat is measured. Gases and vapors are ionized in a flame. A current is produced in proportion to the number of carbon atoms present.</p> <p><b>General Care/Maintenance:</b> Recharge or replace battery. Calibrate immediately before use.</p> <p><b>Typical Operating Time:</b> Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.</p>
Flame Ionization Detector (FID) with Gas Chromatography Option <i>(i.e., Foxboro Organic Vapor Analyzer (OVA))</i>	<p><b>Hazard Monitored:</b> Many organic gases and vapors (approved areas only).</p> <p><b>Application:</b> In survey mode, detects the concentration of many organic gases and vapors. In gas chromatography (GC) mode, identifies and measures specific compounds. In survey mode, all the organic compounds are ionized and detected at the same time. In GC mode, volatile species are separated.</p> <p><b>General Care/Maintenance:</b> Recharge or replace battery. Monitor fuel and/or combustion air supply gauges. Perform routine maintenance as described in the manual. Check for leaks.</p> <p><b>Typical Operating Time:</b> 8 hours; 3 hours with strip chart recorder.</p>
Potable Infrared (IR) Spectrophotometer	<p><b>Hazard Monitored:</b> Many gases and vapors.</p> <p><b>Application:</b> Measures concentration of many gases and vapors in air. Designed to quantify one or two component mixtures.</p> <p><b>Detection Method:</b> Passes different frequencies of IR through the sample. The frequencies absorbed are specific for each compound.</p> <p><b>General Care/Maintenance:</b> As specified by the manufacturer.</p>

Instrument	Operation Parameters
Direct Reading Colorimetric Indicator Tube	<p><b>Hazard Monitored:</b> Specific gas and vapors.</p> <p><b>Application:</b> Measures concentration of specific gases and vapors.</p> <p><b>Detection Method:</b> The compound reacts with the indicator chemical in the tube, producing a stain whose length or color change is proportional to the compound's concentration.</p> <p><b>General Care/Maintenance:</b> Do not use a previously opened tube even if the indicator chemical is not stained. Check pump for leaks before and after use. Refrigerate before use to maintain a shelf life of about 2 years. Check expiration dates of tubes. Calibrate pump volume at least quarterly. Avoid rough handling which may cause channeling.</p>
Aerosol Monitor	<p><b>Hazard Monitored:</b> Airborne particulate (dust, mist, fume) concentrations</p> <p><b>Application:</b> Measures total concentration of semi-volatile organic compounds, PCBs, and metals.</p> <p><b>Detection Method:</b> Based on light-scattering properties of particulate matter. Using an internal pump, air sample is drawn into the sensing volume where near infrared light scattering is used to detect particles.</p> <p><b>General Care/Maintenance:</b> As specified by the mfr. Also, the instrument must be calibrated with particulates of a size and refractive index similar to those to be measured in the ambient air.</p>
Monitox	<p><b>Hazard Monitored:</b> Gases and vapors.</p> <p><b>Application:</b> Measures specific gases and vapors.</p> <p><b>Detection Method:</b> Electrochemical sensor relatively specific for the chemical species in question.</p> <p><b>General Care/Maintenance:</b> Moisten sponge before use; check the function switch; change the battery when needed.</p>
Gamma Radiation Survey Instrument	<p><b>Hazard Monitored:</b> Gamma Radiation.</p> <p><b>Application:</b> Environmental radiation monitor.</p> <p><b>Detection Method:</b> Scintillation detector.</p> <p><b>General Care/Maintenance:</b> Must be calibrated annually at a specialized facility.</p> <p><b>Typical Operating Time:</b> Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.</p>

**TABLE 4  
INSTRUMENTATION ACTION LEVELS**

<b>Photoionization Detector Action Levels</b>	<b>Action Required</b>
Background to 5 ppm <sup>1</sup>	No Respirator, no further action
>5ppm but $\leq$ 15 ppm at the parameter of the work area	Work temporarily halted and monitoring continues If instantaneous readings decrease below 5 ppm above background, work activities will resume with continued monitoring
>5ppm but $\leq$ 25 ppm at the downwind parameter of the hot zone	Work activities will be halted Source of vapors identified Corrective actions taken to abate emissions Continued monitoring Workers will don appropriate respirators and work can resume if vapor levels 200 feet downwind or the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, Work can continue when vapor levels be whichever is less – but in no case less than 20 feet, is below 5 ppm above background for the 15-minute average
>25ppm at the perimeter of the hot zone	Activities will shut down

<b>Particulate Monitoring Action Levels</b>	<b>Action Required</b>
Background to 100 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) <sup>2</sup> , no dust observed	No further action
Background to 100 $\mu\text{g}/\text{m}^3$ , dust observed leaving the work area	Dust suppression must be employed
100 to 150 $\mu\text{g}/\text{m}^3$ at the downwind perimeter of the hot zone	Work activities will be halted Source of dust identified Dust suppression activities initiated Corrective actions taken to abate emissions Continued monitoring Workers will don appropriate respirators Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 concentration to within 150 $\mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.
>150 $\mu\text{g}/\text{m}^3$ at the perimeter of the hot zone	Activities will shut down

<sup>1</sup> VOC concentrations are 15-minute averages above site background (upwind parameter)

<sup>2</sup> Particulate concentrations are 15 minute averages above site background (upwind parameter)

**TABLE 5  
EMERGENCY NOTIFICATION LIST**

<b>ORGANIZATION</b>	<b>CONTACT</b>	<b>TELEPHONE</b>
Local Police Department		911
Local Fire Department		911
Ambulance/Rescue Squad		911
Hospital	Mount Sinai Hospital of Queens	911 or 718-932-1000
Langan Incident Hotline		800-952-6426 ex 4699
Medical Treatment Hotline	Incident Intervention	888-449-7787
Langan Environmental Project Manager	Brian Gochenaur	347-320-2756 (cell)
Langan Health and Safety Manager (HSM)	Tony Moffa	914-803-7130 (cell)
Langan Health & Safety Officer (HSO)	William Bohrer	410-984-3068 (cell)
Langan Field Team Leader (FTL)	Kimberly Semon	631-338-2036 (cell)
Client's Representative	Albert Shirian	516-829-5883
National Response Center (NRC)		800-424-8802
Chemical Transportation Emergency Center (Chemtrec)		800-424-9300
Center for Disease Control (CDC)		404-639-3534
EPA (RCRA Superfund Hotline)		800-424-9346
TSCA Hotline		202-554-1404
Poison Control Center		800-222-1222

***Immediately following an injury, unless immediate emergency medical treatment is required, the injured employee must contact Incident Intervention® at 888-449-7787.***

***For all other incidents or near misses, unless emergency response is required, either the employee or a coworker must contact the Langan Incident Hotline at 1-(800)-9-LANGAN (ext. #4699).***

**TABLE 6**  
**SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING**  
**FOR FIT AND ACCLIMATED WORKERS<sup>A</sup>**

<b>Adjusted Temperature<sup>b</sup></b>	<b>Normal Work Ensemble<sup>c</sup></b>	<b>Impermeable Ensemble</b>
90°F or above (32.2°C) or above	After each 45 min. of work	After each 15 min. of work
87.5°F (30.8°-32.2°C)	After each 60 min. of work	After each 30 min. of work
82.5°-87.5°F (28.1°-30.8°C)	After each 90 min. of work	After each 60 min. of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 min. of work	After each 90 min. of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 min. of work	After each 120 min. of work

a For work levels of 250 kilocalories/hour.

b Calculate the adjusted air temperature (ta adj) by using this equation:  $ta\ adj\ ^\circ F = ta\ ^\circ F + (13 \times \% \text{ sunshine})$ . Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

c A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

**TABLE 7  
HEAT INDEX**

RELATIVE HUMIDITY	ENVIRONMENTAL TEMPERATURE (Fahrenheit)										
	70	75	80	85	90	95	100	105	110	115	120
	<b>APPARENT TEMPERATURE*</b>										
<b>0%</b>	64	69	73	78	83	87	91	95	99	103	107
<b>10%</b>	65	70	75	80	85	90	95	100	105	111	116
<b>20%</b>	66	72	77	82	87	93	99	105	112	120	130
<b>30%</b>	67	73	78	84	90	96	104	113	123	135	148
<b>40%</b>	68	74	79	86	93	101	110	123	137	151	
<b>50%</b>	69	75	81	88	96	107	120	135	150		
<b>60%</b>	70	76	82	90	100	114	132	149			
<b>70%</b>	70	77	85	93	106	124	144				
<b>80%</b>	71	78	86	97	113	136					
<b>90%</b>	71	79	88	102	122						
<b>100%</b>	72	80	91	108							

\*Combined Index of Heat and Humidity...what it "feels like" to the body  
Source: National Oceanic and Atmospheric Administration

How to use Heat Index:

1. Across top locate Environmental Temperature
2. Down left side locate Relative Humidity
3. Follow across and down to find Apparent Temperature
4. Determine Heat Stress Risk on chart at right

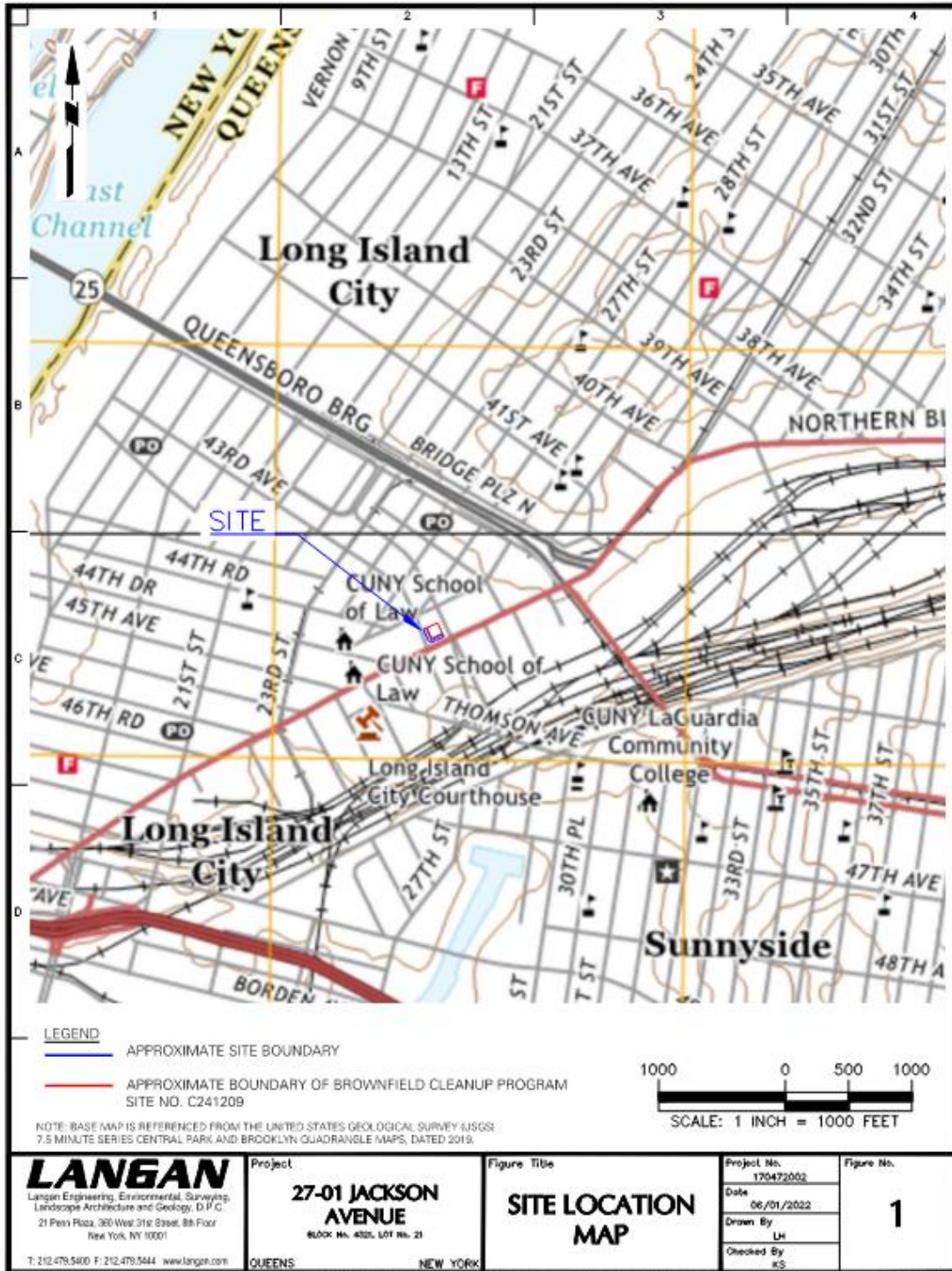
Note: Exposure to full sunshine can increase Heat Index values by up to 15 degrees F.

Apparent Temperature	Heat Stress Risk with Physical Activity and/or Prolonged Exposure
90-105	Heat Cramps or Heat Exhaustion Possible
105-130	Heat Cramps or Heat Exhaustion Likely, Heat Stroke Possible
>130	Heatstroke Highly Likely

# FIGURES

# FIGURE 1

## Site Location Map





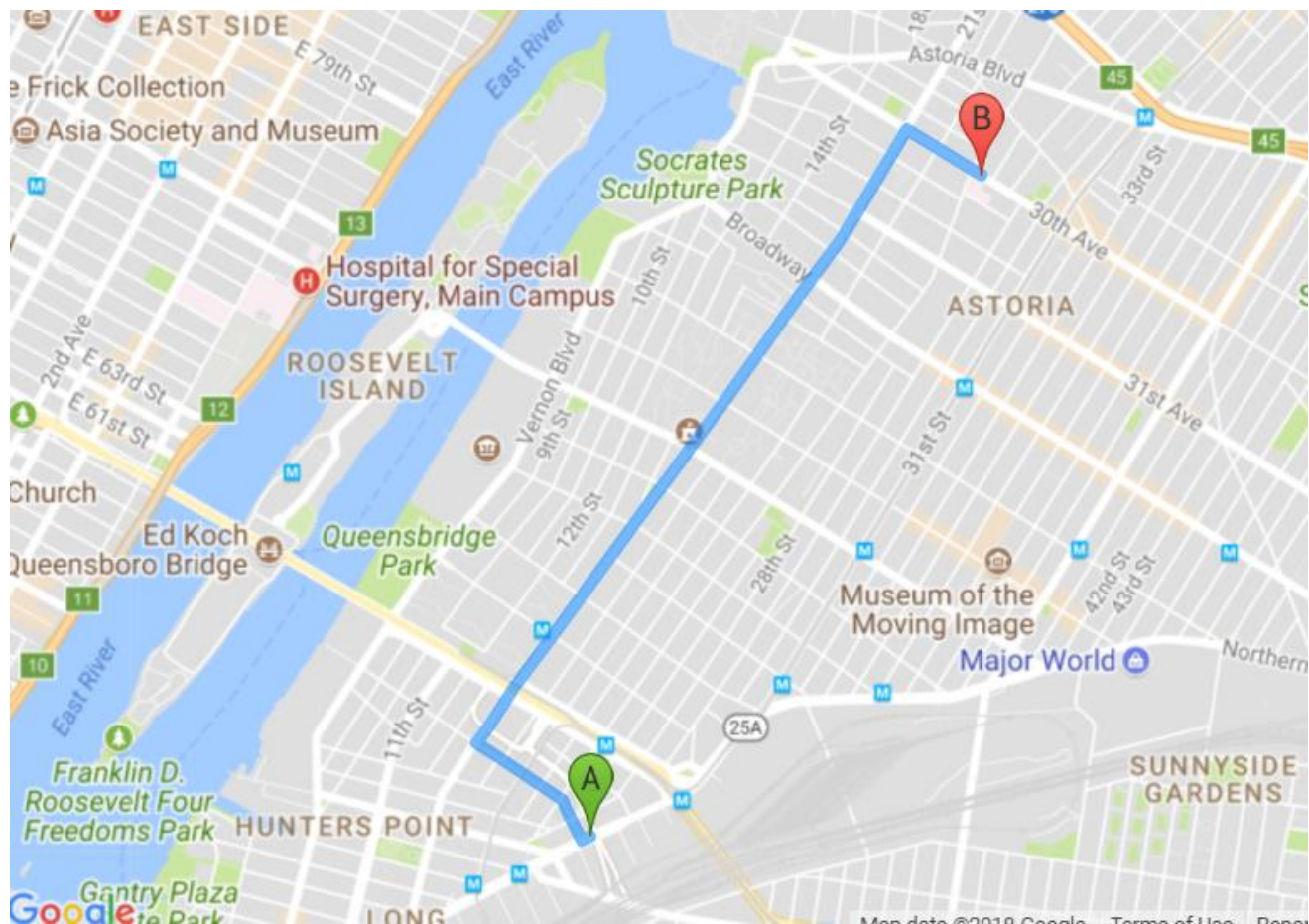
## FIGURE 2 HOSPITAL ROUTE PLAN

**Hospital Location: Mount Sinai Hospital of Queens  
25-10 30<sup>th</sup> Avenue  
Astoria, New York  
718-932-1000**

***START: 27-10 Jackson Avenue, Long Island City, NY***

1. Head southwest on Jackson Avenue toward 43<sup>rd</sup> Avenue
2. Turn right at the 1<sup>st</sup> cross street onto 43<sup>rd</sup> Avenue
3. Turn right onto 21<sup>st</sup> Street
4. Turn right onto 30<sup>th</sup> Avenue, destination will be on the right.

***END: Mount Sinai Hospital of Queens, 25-10 30<sup>th</sup> Avenue, Astoria, NY***



**ATTACHMENT A**

**STANDING ORDERS**

## **STANDING ORDERS**

### **GENERAL**

- No smoking, eating, or drinking in this work zone.
- Upon leaving the work zone, personnel will thoroughly wash their hands and face.
- Minimize contact with contaminated materials through proper planning of work areas and decontamination areas, and by following proper procedures. Do not place equipment on the ground. Do not sit on contaminated materials.
- No open flames in the work zone.
- Only properly trained and equipped personnel are permitted to work in potentially contaminated areas.
- Always use the appropriate level of PPE.
- Maintain close contact with your buddy in the work zone
- Contaminated material will be contained in the Exclusion Zone (EZ).
- Report any unusual conditions.
- Work areas will be kept clear and uncluttered. Debris and other slip, trip, and fall hazards will be removed as frequently as possible.
- The number of personnel and equipment in the work zone will be kept to an essential minimum.
- Be alert to the symptoms of fatigue and heat/cold stress, and their effects on the normal caution and judgment of personnel.
- Conflicting situations which may arise concerning safety requirements and working conditions must be addressed and resolved quickly by the site HSO.

### **TOOLS AND HEAVY EQUIPMENT**

- Do not, under any circumstances, enter or ride in or on any backhoe bucket, materials hoist, or any other device not specifically designed to carrying passengers.
- Loose-fitting clothing or loose long hair is prohibited around moving machinery.
- Ensure that heavy equipment operators and all other personnel in the work zone are using the same hand signals to communicate.
- Drilling/excavating within 10 feet in any direction of overhead power lines is prohibited.
- The locations of all underground utilities must be identified and marked out prior to initiating any subsurface activities.
- Check to insure that the equipment operator has lowered all blades and buckets to the ground before shutting off the vehicle.
- If the equipment has an emergency stop device, have the operator show all personnel its location and how to activate it.
- Help the operator ensure adequate clearances when the equipment must negotiate in tight quarters; serve as a signalman to direct backing as necessary.
- Ensure that all heavy equipment that is used in the Exclusion Zone is kept in that zone until the job is done, and that such equipment is completely decontaminated before moving it into the clean area of the work zone.
- Samplers must not reach into or get near rotating equipment such as the drill rig. If personnel must work near any tools that could rotate, the equipment operator must completely shut down the rig prior to initiating such work. It may be necessary to use a remote sampling device.

# **ATTACHMENT B**

## **DECONTAMINATION PROCEDURES**

## PERSONNEL DECONTAMINATION

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### LEVEL C DECONTAMINATION

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Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	2. Scrub outer boots, outer gloves and chemical-resistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Canister or Mask Change	4. If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5:	Boot, Gloves and Outer Garment Removal	5. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6:	Face piece Removal	6. Face piece is removed (avoid touching face with fingers). Face piece deposited on plastic sheets.
Station 7:	Field Wash	7. Hands and face are thoroughly washed. Shower as soon as possible.

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### LEVEL D DECONTAMINATION

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Station 1:	Equipment Drop	1. Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	2. Scrub outer boots, outer gloves and chemical-resistant splash suit with decon solution or detergent and water. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	3. Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Boot, Gloves and Outer Garment Removal	4. Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 5:	Field Wash	5. Hands and face are thoroughly washed. Shower as soon as possible.

## **EQUIPMENT DECONTAMINATION**

### **GENERAL:**

Equipment to be decontaminated during the project may include tools, monitoring equipment, respirators, sampling containers, laboratory equipment and drilling equipment.

All decontamination will be done by personnel in protective gear, appropriate for the level of decontamination, as determined by the site HSO. The decontamination work tasks will be split or rotated among support and work crews.

Depending on site conditions, backhoe and pumps may be decontaminated over a portable decontamination pad to contain wash water; or, wash water may be allowed to run off into a storm sewer system. Equipment needed may include a steam generator with high-pressure water, empty drums, screens, screen support structures, and shovels. Drums will be used to hold contaminated wash water pumped from the lined pit. These drums will be labeled as such.

Miscellaneous tools and equipment will be dropped into a plastic pail, tub, or other container. They will be brushed off and rinsed with a detergent solution, and finally rinsed with clean water.

### **MONITORING EQUIPMENT:**

Monitoring equipment will be protected as much as possible from contamination by draping, masking, or otherwise covering as much of the instruments as possible with plastic without hindering the operation of the unit. The PID, HNu or OVA meter, for example, can be placed in a clear plastic bag, which allows reading of the scale and operation of knobs. The probes can be partially wrapped keeping the sensor tip and discharge port clear.

The contaminated equipment will be taken from the drop area and the protective coverings removed and disposed in the appropriate containers. Any dirt or obvious contamination will be brushed or wiped with a disposable paper wipe.

### **RESPIRATORS:**

Respirators will be cleaned and disinfected after every use. Taken from the drop area, the masks (with the cartridges removed and disposed of with other used disposable gear) will be immersed in a cleaning solution and scrubbed gently with a soft brush, followed by a rinse in plain warm water, and then allowed to air dry. In the morning, new cartridges will be installed. Personnel will inspect their own masks for serviceability prior to donning them. And, once the mask is on, the wearer will check the respirator for leakage using the negative and positive pressure fit check techniques.

# **ATTACHMENT C**

## **EMPLOYEE EXPOSURE/ INJURY INCIDENT REPORT**

# EMPLOYEE INCIDENT/INJURY REPORT LANGAN ENGINEERING & ENVIRONMENTAL SERVICES

*(Complete and return to Tony Moffa in the Doylestown Office)*

Affected Employee Name: \_\_\_\_\_

Date: \_\_\_\_\_

Incident type:       Injury       Report Only/No Injury  
                          Near Miss       Other: \_\_\_\_\_

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## **EMPLOYEE INFORMATION** (Person completing Form)

Employee Name: \_\_\_\_\_

Employee

No: \_\_\_\_\_

Title: \_\_\_\_\_

Office

Location: \_\_\_\_\_

Length of time employed or date of hire: \_\_\_\_\_

Mailing address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sex: M  F  Birth date: \_\_\_\_\_

Business phone & extension: \_\_\_\_\_

Residence/cell

phone: \_\_\_\_\_

---

## **ACCIDENT INFORMATION**

Project: \_\_\_\_\_

Project

#: \_\_\_\_\_

Date & time of incident: \_\_\_\_\_ Time work started & ended: \_\_\_\_\_

Site location: \_\_\_\_\_  
\_\_\_\_\_

Incident Type: Possible Exposure  Exposure  Physical Injury



Names of person(s) who witnessed the incident: \_\_\_\_\_

Exact location incident occurred: \_\_\_\_\_

Describe work being done: \_\_\_\_\_

Describe what affected employee was doing prior to the incident occurring: \_\_\_\_\_

Describe in detail how the incident occurred: \_\_\_\_\_

Nature of the incident (List the parts of the body affected): \_\_\_\_\_

Person(s) to whom incident was reported (Time and Date): \_\_\_\_\_

List the names of other persons affected during this incident: \_\_\_\_\_

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Possible causes of the incident (equipment, unsafe work practices, lack of PPE, etc.):

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Weather conditions during incident:

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**MEDICAL CARE INFORMATION**

Did affected employee receive medical care? Yes  No

If Yes, when and where was medical care received: \_\_\_\_\_  
\_\_\_\_\_

Provide name of facility (hospital, clinic, etc.):  
\_\_\_\_\_  
\_\_\_\_\_

Length of stay at the facility?  
\_\_\_\_\_

Did the employee miss any work time? Yes  No  Undetermined

Date employee last worked: \_\_\_\_\_ Date employee returned to work: \_\_\_\_\_

Has the employee returned to work? Yes  No

Does the employee have any work limitations or restrictions from the injury? : Yes  No

If Yes, please describe:  
\_\_\_\_\_  
\_\_\_\_\_

Did the exposure/injury result in permanent disability? Yes  No  Unknown

If Yes, please describe:  
\_\_\_\_\_

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**HEALTH & SAFETY INFORMATION**

Was the operation being conducted under an established site specific HEALTH AND SAFETY PLAN?

Yes  No  Not Applicable:

Describe protective equipment and clothing used by the employee:

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Did any limitations in safety equipment or protective clothing contribute to or affect exposure / injury? If so, explain:

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---

Employee Signature

Date

---

---

Langan Representative

Date

**ATTACHMENT D**

**CALIBRATION LOG**



**ATTACHMENT E**

**MATERIAL SAFETY DATA SHEETS**

**SAFETY DATA SHEETS**

*All Langan Field Personnel Completing This Work Plan Are To Have Real Time Accessibility To Material Safety Data Sheet (MSDs) or Safety Data Sheet (SDSs) Through Their Smart Phone.*

*The link is <http://www.msds.com/>  
The login name is "drapehead"  
The password is "2angan987"*

*If You Are Unable To Use the Smart Phone App, You Are To Bring Printed Copies of the MSDs/SDSs to the Site*

# **ATTACHMENT F**

## **JOBSITE SAFETY INSPECTION CHECKLIST**

## Jobsite Safety Inspection Checklist

**Date:** \_\_\_\_\_ **Inspected By:** \_\_\_\_\_

**Location:** \_\_\_\_\_ **Project #:** \_\_\_\_\_

Check one of the following: **A:** Acceptable **NA:** Not Applicable **D:** Deficiency

	A	NA	D	Remark
1. HASP available onsite for inspection?				
2. Health & Safety Compliance agreement (in HASP) appropriately signed by Langan employees and contractors?				
3. Hospital route map with directions posted on site?				
4. Emergency Notification List posted on site?				
5. First Aid kit available and properly stocked?				
6. Personnel trained in CPR/First Aid on site?				
7. MSDSs readily available, and all workers knowledgeable about the specific chemicals and compounds to which they may be exposed?				
8. Appropriate PPE being worn by Langan employees and contractors?				
9. Project site safe practices ("Standing Orders") posted?				
10. Project staff have 40-hr./8-hr./Supervisor HAZWOPER training?				
11. Project staff medically cleared to work in hazardous waste sites and fit-tested to wear respirators, if needed?				
12. Respiratory protection readily available?				
13. Health & Safety Incident Report forms available?				
14. Air monitoring instruments calibrated daily and results recorded on the Daily Instrument Calibration check sheet?				
15. Air monitoring readings recorded on the air monitoring data sheet/field log book?				
16. Subcontract workers have received 40-hr./8-hr./Spvsr. HAZWOPER training, as appropriate?				
17. Subcontract workers medically cleared to work on site, and fit-tested for respirator wear?				
18. Subcontract workers have respirators readily available?				
19. Mark outs of underground utilities done prior to initiating any subsurface activities?				
20. Decontamination procedures being followed as outlined in HASP?				
21. Are tools in good condition and properly used?				
22. Drilling performed in areas free from underground objects including utilities?				



23. Adequate size/type fire extinguisher supplied?				
24. Equipment at least 20 feet from overhead power lines?				
25. Evidence that drilling operator is responsible for the safety of his rig.				
26. Trench sides shored, layer back, or boxed?				
27. Underground utilities located and authorities contacted before digging?				
28. Ladders in trench (25-foot spacing)?				
29. Excavated material placed more than 2 feet away from excavation edge?				
30. Public protected from exposure to open excavation?				
31. People entering the excavation regarding it as a permit-required confined space and following appropriate procedures?				
32. Confined space entry permit is completed and posted?				
33. All persons knowledgeable about the conditions and characteristics of the confined space?				
34. All persons engaged in confined space operations have been trained in safe entry and rescue (non-entry)?				
35. Full body harnesses, lifelines, and hoisting apparatus available for rescue needs?				
36. Attendant and/or supervisor certified in basic first aid and CPR?				
37. Confined space atmosphere checked before entry and continuously while the work is going on?				
38. Results of confined space atmosphere testing recorded?				
39. Evidence of coordination with off-site rescue services to perform entry rescue, if needed?				
40. Are extension cords rated for this work being used and are they properly maintained?				
41. Are GFCIs provided and being used?				

Unsafe Acts: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**ATTACHMENT G**

**JOB SAFETY ANALYSIS FORM**

# LANGAN

## Job Safety Analysis (JSA) Health and Safety

JSA Title: COVID-19 Awareness – Site Work  
JSA Number: JSA046-00

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work “TAKE 5” and conduct a Last Minute Risk Assessment.



- S – Stop, what has changed?
- T – Think about the task
- E – Evaluate potential hazards
- P – Plan safe approach
- S – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Boots	<input type="checkbox"/> Long Sleeves	<input type="checkbox"/> Safety Vest (Class 2)	<input type="checkbox"/> Hard Hat	<input type="checkbox"/> Hearing Protection
<input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input checked="" type="checkbox"/> Other: Alcohol-based hand sanitizer, disinfectant wipes/spray				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. All Activities	1. Transmittal/exposure of COVID-19	<ol style="list-style-type: none"> <li>1. Ask yourself and your managers – is this work essential? Can this be done remotely?</li> <li>2. Stay home if sick or showing symptoms of COVID-19 (e.g. fever, cough, etc.).</li> <li>3. Carry nitrile gloves, alcohol-based hand sanitizer, face coverings and disinfectant wipes/spray during field work.</li> <li>4. Check federal, state, and/or local travel restrictions <b>prior</b> to travel. Many states, counties, and cities are passing strict “shelter-in-place” or business restrictions in response to COVID-19.</li> <li>5. Immediately notify Beverly Williams or Rory Johnston (Supervisor if employee chooses) if you display symptoms of COVID-19. Symptoms include fever (over 100.4 F), cough, and shortness of breath.</li> <li>6. Notify Beverly Williams or Rory Johnston, Supervisor and Coronavirus Task Force if you had close contact with an individual who tested positive or displayed symptoms of COVID-19.</li> <li>7. Do not touch your face, to the extent possible.</li> <li>8. Wear face coverings when around other worker to minimize spread of COVID-19. (May be required in certain states or locations.)</li> </ol>

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		<ol style="list-style-type: none"> <li>9. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. Avoid gatherings of more than 10 people. Limit, to the extent possible, contact with public items/objects.</li> <li>10. Clean your hands frequently with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, sneezing, or using the rest room.</li> <li>11. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry.</li> <li>12. Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow.</li> <li>13. Clean and disinfect frequently touched surfaces daily, for example, cell phones, computer equipment, headsets, tables, doorknobs, light switches, countertops, handles, desks, toilets, faucets, and sinks.</li> </ol>
<ol style="list-style-type: none"> <li>2. Travel to Jobsite</li> </ol>	<ol style="list-style-type: none"> <li>1. Transmittal/exposure of COVID-19 between passengers</li> <li>2. Transmittal/exposure of COVID-19 from previous occupants (rental and fleet vehicles)</li> <li>3. Transmittal/exposure of COVID-19 while refueling</li> </ol>	<ol style="list-style-type: none"> <li>1. Limit the number of occupants to each vehicle to 2 people. Employees should sit as far away from each other as possible.</li> <li>2. Disinfect high "hand-traffic" areas of the vehicle: Door handles, steering wheel, turn signal and control rods, dashboard controls, seatbelts, armrests, etc. To the extent possible, do not use recycled air for heat/AC and travel with the windows open.</li> <li>3. Use hand sanitizer before and after pumping gas and only return to the inside of the vehicle after refueling is complete.</li> <li>4. Wear nitrile gloves if available or disinfect the key pad, pump handle, and fuel grade button prior to use.</li> <li>5. Recommend face coverings are worn to minimize spread of COVID-19.</li> </ol>
<ol style="list-style-type: none"> <li>3. Conduct Tailgate Safety Meeting &amp; Complete H&amp;S Paperwork</li> </ol>	<ol style="list-style-type: none"> <li>1. Transmittal/exposure of COVID-19 between meeting participants</li> </ol>	<ol style="list-style-type: none"> <li>1. Practice social distancing, maintaining at least 6 feet of distance between yourself and others.</li> <li>2. Recommend face coverings are worn when around other workers to minimize spread of COVID-19,</li> <li>3. Hold meetings outside and keep in mind wind direction. To the extent possible, remain cross-wind from other people.</li> <li>4. Designate a single person to maintain sign-in sheets/permits throughout the day to limit the passing of pens/clipboards between people.</li> <li>5. Each person should complete their own JSA, even if they are completing similar tasks as others in order to limit the passing of paper/pens/clipboards between people.</li> <li>6. Include COVID-19 topics and prevention measures in safety meetings.</li> </ol>
<ol style="list-style-type: none"> <li>4. Conduct Site Work</li> </ol>	<ol style="list-style-type: none"> <li>1. Transmittal/exposure of COVID-19 between site workers and public.</li> </ol>	<ol style="list-style-type: none"> <li>1. Practice social distancing maintaining 6 feet of distance between yourself and others.</li> <li>2. Recommend face coverings are worn when around other workers to minimize spread of COVID-19,</li> <li>3. To the extent possible, do not interact with the public. If it is necessary, politely explain you are practicing social distance and request they stay at least 6 feet away and they do not attempt to pass objects to you.</li> <li>4. Wear nitrile gloves during site work underneath the appropriate gloves for your task. Utilize appropriate decontamination procedures, securely bag all waste (including nitrile gloves) generated during site work and dispose of.</li> </ol>

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		<ol style="list-style-type: none"> <li>5. Do not share tools. Each person should be equipped with the tools to complete their task or tasks should be divided to remove the need to share tools. If tools must be shared, surfaces should be disinfected.</li> <li>6. Clean and disinfect surfaces of rental tools and equipment upon receipt. To the extent possible rent equipment from Langan's internal equipment reservation center, where cleaning/disinfecting procedures can be verified.</li> </ol>
5. Use of Construction Trailers	1. Transmittal/exposure of COVID-19 between site workers and others.	<ol style="list-style-type: none"> <li>1. Avoid use of shared trailers, if possible. Minimize trailer use to essential personnel.</li> <li>2. Practice social distancing; maintaining 6 feet of distance between yourself and others in trailer.</li> <li>3. Clean and disinfect areas including desks, phones, chairs and other common areas, before and after use.</li> </ol>
6. Purchasing Food from a Restaurant	1. Transmittal/exposure of COVID-19 from other customers, staff, surfaces.	<ol style="list-style-type: none"> <li>1. To the extent possible, bring your own food.</li> <li>2. If you must visit a restaurant, call ahead for take-out or "contactless delivery". Do not dine in. When picking up food, follow guidelines for <u>Job Step #8: Purchasing Supplies at Retail/Shipping Centers</u>.</li> <li>3. Wash hands before and after eating.</li> </ol>
7. Smoking Cigarettes	1. Transmittal/exposure of COVID-19 by touching mouth with hands	<ol style="list-style-type: none"> <li>1. Cigarette smokers maybe at greater risk of complications arising from COVID-19. Nicotine patches/lozenges/gum, smoking cessation programs, and prescription medications may aid in "kicking the habit" if you decide to quit.</li> <li>2. Wash hands thoroughly before and after smoking.</li> <li>3. Discard cigarette butts properly. Do not light cigarettes from others and do not give cigarettes to others.</li> </ol>
8. Hotel Stay	1. Transmittal/exposure of COVID-19 from previous occupants, hotel staff, common areas.	<ol style="list-style-type: none"> <li>1. Verify the hotel chain/brand has modified cleaning procedures to reflect risk of COVID-19. Most hotel companies have issued statements on their websites and in email blasts reflecting these new procedures.</li> <li>2. Use the front door, and not peripheral entrances. Front doors of hotels are generally automatic.</li> <li>3. Request ground floor room to avoid elevator use and a room that has not be utilized in 48-72 hours.</li> <li>4. If elevator use is required, do not directly touch elevator buttons with your hands. Do not ride elevators with other people, to the extent possible.</li> <li>5. Bring disinfecting wipes or sanitizing spray. Upon arrival, disinfect high "hand-traffic" areas of the hotel room: Door handles, light switches, shower/sink faucet handles, TV remote, curtain/blind handles. Clean these surfaces daily.</li> <li>6. Place the "Do Not Disturb" Sign on your door to prevent people (housekeeping) from entering your room.</li> <li>7. Avoid common spaces and hotel sponsored events where crowds will be present.</li> <li>8. Confirm hotel cleaning procedures have been modified to address COVID-19. Confirm no COVID-19 cases have occurred in hotel</li> </ol>
9. Purchasing Supplies at Retail/Shipping Centers	1. Transmittal/exposure of COVID-19 from other customers, staff, surfaces.	<ol style="list-style-type: none"> <li>1. Plan your travel to limit the need to visit retail/shipping centers.</li> <li>2. Practice social distancing, maintaining at least 6 feet of distance between yourself and others. If the store is too crowded/small, consider visiting another store or returning at a different time.</li> <li>3. Avoid high "hand-traffic" items/areas like door handles (i.e. use your shoulder, hip/butt, or open with a disposable napkin/paper towel), credit cards terminals (i.e. use Apple/Android pay if available), shopping carts/baskets (i.e. bring your own shopping</li> </ol>

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		bags), counter tops (i.e. ask clerk if you can hold the items while they are scanned) and bulk/buffet items (i.e. just avoid them). 4. Disinfect your hands before and after visiting a retail/shipping center.

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><i>Prepared by:</i></b>		
<b><i>Reviewed by:</i></b>		

# LANGAN

## Job Safety Analysis (JSA) Health and Safety

**JSA Title:** Environmental Sampling  
**JSA Number:** JSA021-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventative/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



- S** – Stop, what has changed?
- T** – Think about the task
- E** – Evaluate potential hazards
- P** – Plan safe approach
- S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input checked="" type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input checked="" type="checkbox"/> Insect/Animal Repellent	<input checked="" type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input checked="" type="checkbox"/> Other: Tyvek Sleeves				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Drive to sample location	1. Rough/Off Road terrain	1. Pay attention to road conditions such as road erosion, unprotected embankments, and soft road conditions.
2. Sample Collection (Walking)	1. Slip/Trips/Falls 2. Back strains 3. Wildlife (Insects, Stray animals, rodents) 4. Poisonous vegetation	1. Minimize distance to sample area/ Plan route and check surface prior to carrying heavy equipment/ Locate safest access point/ Follow good housekeeping procedures/ Mark significant below grade hazards (holes, trenches) with spray paint or cones/ Wear foot protection with ankle support and gripping soles. 2. Use proper lifting techniques/ Use wheeled transport/ Obtain assistance where and when needed/ Consider load weight when evaluating what is safe and unsafe to carry. 3. Be aware of surroundings for the presence of wildlife. Do not approach stray animals. Carry and use animal repellent when needed/ Use bug spray when needed. 4. Keep skin covered/ Identify and avoid poisonous vegetation/ Clean areas after contact with suspected vegetation.
3. Sample Collection (Water)	1. Drowning Hazards 2. Chemical burns (when adding acid preservative to sample) 3. Back Strains 4. Ergonomic issues 5. Slip/Trips/Falls	1. Use buddy system/ Wear flotation vest if water is deeper than 2 feet or swift moving/ Select working area with stable footing. Do not attempt to cross or stand in swift moving water. 2. Wear proper PPE (Nitrile gloves, Tyvek Sleeves) 3. Use proper lifting techniques/ Use wheeled transport/ Obtain assistance where and when needed/ Consider load weight when evaluating what is safe or unsafe to carry. 4. When possible avoid bending over for long periods of time/ Use a small stool for sitting or knee pad for kneeling.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		5. Minimize distance to sample area/ Plan route and check surface prior to carrying heavy equipment/ Locate safest access point/ Follow good housekeeping procedures/ Mark significant below grade hazards (holes, trenches) with spray paint or cones/ Wear foot protection with ankle support and gripping soles/ Avoid standing water or slippery terrain.
4.All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas where overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Take breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><u>Prepared by:</u></b>		
<b><u>Reviewed by:</u></b>		





# LANGAN

## Job Safety Analysis (JSA) Health and Safety

JSA Title: Subsurface Investigation  
JSA Number: JSA030-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



- S** – Stop, what has changed?
- T** – Think about the task
- E** – Evaluate potential hazards
- P** – Plan safe approach
- S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input checked="" type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input checked="" type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input checked="" type="checkbox"/> Other: Dielectric Overshoes, Sun Block				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Transport equipment to work area	<ol style="list-style-type: none"> <li>Back/strain</li> <li>Slip/Trip/Falls</li> <li>Traffic</li> <li>Cuts/abrasions/contusions from equipment</li> <li>Accidents due to vehicle operations</li> </ol>	<ol style="list-style-type: none"> <li>Use proper lifting techniques/Use wheeled transport</li> <li>Minimize distance to work area/unobstructed path to work area/follow good housekeeping procedures</li> <li>Wear proper PPE (high visibility vest or clothing)</li> <li>Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes)</li> <li>Observe posted speed limits/ Wear seat belts at all times</li> </ol>
6. Traffic	<ol style="list-style-type: none"> <li>Hit by moving vehicle</li> </ol>	<ol style="list-style-type: none"> <li>Use traffic cones and signage/ Use High visibility traffic vests and clothing/ Caution tape when working near active roadways.</li> </ol>
7. Field Work (drilling, resistivity testing, and inspection)	<ol style="list-style-type: none"> <li>Biological Hazards: insects, rats, snakes, poisonous plants, and other animals</li> <li>Heat stress/injuries</li> <li>Cold Stress/injuries</li> <li>High Energy Transmission Lines</li> <li>Underground Utilities</li> <li>Electrical (soil resistivity testing)</li> </ol>	<ol style="list-style-type: none"> <li>Inspect work area to identify biological hazards. Wear light colored long sleeve shirt and long pants/ Use insect repellent as necessary/ Beware of tall grass, bushes, woods and other areas where ticks may live/ Avoid leaving garbage on site to prevent attracting animals/ Identify and avoid contact with poisonous plants/Beware of rats, snakes, or stray animals.</li> <li>Wear proper clothing (light colored)/ drink plenty of water/ take regular breaks/use sun block</li> <li>Wear proper clothing/ dress in layers/ take regular breaks.</li> <li>Avoid direct contact with high energy transmission lines/ position equipment at least 15 feet or as required by PSE&amp;G from the transmission lines/ wear proper PPE (dielectric overshoes 15 kV minimum rating).</li> </ol>

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		5. Call one-call service before performing intrusive field work/ Review utility mark-outs and available utility drawings (with respect to proposed work locations)/ Follow Underground Utility Guidelines 6. See AGI Sting R1 operating manual for specific concerns during operating instrument
8.All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	7. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 8. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 9. Wear Langan approved safety shoes 10. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 11. Wear high visibility clothing & vest / Use cones or signs to designate work area 12. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 13. Wear proper hearing protection 14. Wear hard hat / Avoid areas where overhead hazards exist. 15. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 16. Wear safety glasses
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><u>Prepared by:</u></b>		
<b><u>Reviewed by:</u></b>		



# LANGAN

## Job Safety Analysis (JSA) Health and Safety

JSA Title: Field Sampling  
JSA Number: JSA022-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventative/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



**S** – Stop, what has changed?  
**T** – Think about the task  
**E** – Evaluate potential hazards  
**P** – Plan safe approach  
**S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input checked="" type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input type="checkbox"/> Other: _____				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
9. Unpack/Transport equipment to work area.	7. Back Strains 8. Slip/Trips/Falls 9. Cuts/Abrasions from equipment 10. Contusions from dropped equipment	6. Use proper lifting techniques/Use wheeled transport 7. Minimize distance to work area/Unobstructed path to work area/follow good housekeeping procedures. Mark slip/trip/fall hazards with orange safety cones. 8. Wear proper PPE (leather gloves, long sleeves). 9. Wear proper PPE (Langan approved safety shoes).
10. Initial Site Arrival-Site Assessment	5. Traffic	5. Situational awareness (be alert of your surroundings). Secure area from through traffic.
11. Surface Water Sampling	6. Contaminated media. Skin/eye contact with biological agents and/or chemicals.	6. Wear appropriate PPE (Safety glasses, appropriate gloves). Review (M)SDS for all chemicals being.
12. Sampling from bridges	1. Struck by vehicles	1. Wear appropriate PPE (Safety Vest). Use buddy system and orange safety cones.
13. Icing of Samples/ Transporting coolers/equipment from work area.	11. Back Strains 12. Slips/Trips/Falls 13. Cuts/Abrasions from equipment 14. Pinch/Crushing Hazards.	17. Drain coolers of water. Use proper lifting techniques. Use wheeled transport. 18. Have unobstructed path from work area. Aware of surroundings. 19. Wear proper PPE (Leather gloves, long sleeves) 20. Wear proper PPE (Leather gloves, long sleeves)
14. Site Departure	1. Contaminated PPE/Vehicle	1. Contaminated PPE should be disposed of on-site. Remove boots and soiled clothing for secure storage in trunk. Wash hands promptly.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
15. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 15. Traffic 16. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 17. High Noise levels 18. Overhead hazards 19. Heat Stress/ Cold Stress 20. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 21. Wear high visibility clothing & vest / Use cones or signs to designate work area 22. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 23. Wear hearing protection 24. Wear hard hat / Avoid areas where overhead hazards exist. 25. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 26. Wear safety glasses
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><u>Prepared by:</u></b>		
<b><u>Reviewed by:</u></b>		


# LANGAN

## Job Safety Analysis (JSA) Health and Safety

**JSA Title:** Equipment Transportation and Set-up  
**JSA Number:** JSA012-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



- S** – Stop, what has changed?
- T** – Think about the task
- E** – Evaluate potential hazards
- P** – Plan safe approach
- S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	

Other:

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
16. Transport equipment to work area	11. Back Strain 12. Slips/ Trips/ Falls 13. Traffic 14. Cuts/abrasions from equipment 15. Contusions from dropped equipment	1. Use proper lifting techniques / Use wheeled transport 2. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 3. Wear proper PPE (high visibility vest or clothing) 4. Wear proper PPE (leather gloves, long sleeves) 5. Wear proper PPE (safety shoes)
17. Moving equipment to its planned location	6. Pinch Hazard 7. Slips/ Trips/ Falls	1. Wear proper PPE (leather gloves) 2. Be aware of potential trip hazards / Practice good housekeeping procedures / Mark significant below-grade hazards (i.e. holes, trenches) with safety cones or spray paint
18. Equipment Set-up	7. Pinch Hazard 8. Cuts/abrasions to knuckles/hands 9. Back Strain	1. Wear proper PPE (leather gloves) 2. Wear proper PPE (leather gloves) 3. Use proper lifting techniques / Use wheeled transport
19. All activities	21. Slips/ Trips/ Falls 22. Hand injuries, cuts or lacerations during manual handling of materials 23. Foot injuries 24. Back injuries 25. Traffic 26. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.)	27. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 28. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 29. Wear Langan approved safety shoes



JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
4. All activities (cont'd)	27. High Noise levels 28. Overhead hazards 29. Heat Stress/ Cold Stress 30. Eye Injuries	30. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 31. Wear high visibility clothing & vest / Use cones or signs to designate work area 32. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 33. Wear hearing protection 34. Wear hard hat / Avoid areas where overhead hazards exist. 35. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 36. Wear safety glasses
Additional items.		
Additional Items identified while in the field.		
(Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><u>Prepared by:</u></b>		
<b><u>Reviewed by:</u></b>		


# LANGAN

## Job Safety Analysis (JSA) Health and Safety

JSA Title: 55-gallon Drum Sampling  
JSA Number: JSA043-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventative/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



**S** – Stop, what has changed?  
**T** – Think about the task  
**E** – Evaluate potential hazards  
**P** – Plan safe approach  
**S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input checked="" type="checkbox"/> Safety Goggles	<input checked="" type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input checked="" type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	

Other: All Drums are required to be labeled. Langan employees do not open or move undocumented drums or unlabeled drums without proper project manager authorization.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
20. Unpack/Transport equipment to work area.	16. Back Strains 17. Slip/Trips/Falls 18. Cuts/Abrasions from equipment 4. Contusions from dropped equipment	10. Use proper lifting techniques/Use wheeled transport 11. Minimize distance to work area/Unobstructed path to work area/follow good housekeeping procedures. Mark slip/trip/fall hazards with orange safety cones. 12. Wear proper PPE (leather gloves, long sleeves). 4. Wear proper PPE (Langan approved safety shoes).
21. Open Drums	1. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid. 2. Pressure from drums.	1. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches. 2. Open drum slowly to relieve pressure. Wear proper PPE: face shield and goggles; correct gloves; and over garments.
22. Collecting Soil/Fluid Sample	8. Irritation to eye from vapor, soil dust, or splashing 9. Irritation to exposed skin	6. Wear proper eye protection including safety glasses/ face shield/goggles and when necessary, splash guard. If dust or vapor phase is present, wear appropriate safety breathing gear (1/2 mask or full face mask with correct filter) 7. Wear proper skin protection including nitrile gloves.
23. Closing Drums	1. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid.	7. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
24. Moving Drums	2. Hand Injuries, cuts or lacerations when untightening drum locking bolt, removing drum lid strap, or removing lid. 3. Back Strains	2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves. Use non-metallic mallet and non-sparking tools/wrenches. 3. Use proper lifting techniques/Use wheeled transport
25. All activities	31. Slips/ Trips/ Falls 32. Hand injuries, cuts or lacerations during manual handling of materials 33. Foot injuries 34. Back injuries 35. Traffic 36. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 37. High Noise levels 38. Overhead hazards 39. Heat Stress/ Cold Stress 40. Eye Injuries	37. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 38. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 39. Wear Langan approved safety shoes 40. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 41. Wear high visibility clothing & vest / Use cones or signs to designate work area 42. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 43. Wear hearing protection 44. Wear hard hat / Avoid areas where overhead hazards exist. 45. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 46. Wear safety glasses
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><u>Prepared by:</u></b>		
<b><u>Reviewed by:</u></b>		



# LANGAN

## Job Safety Analysis (JSA) Health and Safety

**JSA Title:** Groundwater Sampling  
**JSA Number:** JSA008-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventative/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



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- T** – Think about the task
- E** – Evaluate potential hazards
- P** – Plan safe approach
- S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input checked="" type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input checked="" type="checkbox"/> Other: Tyvek sleeves, Dermal Protection, PID				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
26. Transport equipment to work area	<ol style="list-style-type: none"> <li>Back Strain</li> <li>Slips/ Trips/ Falls</li> <li>Traffic</li> <li>Cuts/abrasions from equipment</li> <li>Contusions from dropped equipment</li> </ol>	<ol style="list-style-type: none"> <li>Use proper lifting techniques / Use wheeled transport</li> <li>Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures</li> <li>Wear proper PPE (high visibility vest or clothing)</li> <li>Wear proper PPE (leather gloves, long sleeves)</li> <li>Wear proper PPE (safety shoes)</li> </ol>
27. Remove well cover	<ol style="list-style-type: none"> <li>Scrape knuckles/hand</li> <li>Strain wrist/bruise palm</li> <li>Pinch fingers or hand</li> </ol>	<ol style="list-style-type: none"> <li>Wear proper PPE (leather gloves)</li> <li>Using a hammer, tap the end of the wrench to loosen grip of bolts</li> <li>Wear proper PPE (leather gloves)</li> </ol>
28. Remove well cap and lock	<ol style="list-style-type: none"> <li>Well can pops from pressure</li> <li>Exposure to hazardous substances through inhalation or dermal exposure</li> <li>Scrape knuckles/hand</li> <li>Strain write/bruise palm</li> </ol>	<ol style="list-style-type: none"> <li>Remove cap slowly to relieve pressure / Do not place face over well when opening / Wear proper PPE (safety glasses)</li> <li>Use direct air monitoring/reading instrument (i.e. PID) / Be familiar with and follow actions prescribed in the HASP / Wear proper PPE (nitrile gloves)</li> <li>Wear proper PPE (leather gloves)</li> <li>Using hammer, tap the end of the wrench to loosen grip</li> </ol>
29. Measure head-space vapor levels	<ol style="list-style-type: none"> <li>Exposure to hazardous substances through inhalation</li> </ol>	<ol style="list-style-type: none"> <li>Do not place face over well when collecting measurement</li> </ol>
30. Remove dedicated tubing (if necessary)	<ol style="list-style-type: none"> <li>Exposure to hazardous substances through inhalation or dermal exposure</li> <li>Tubing swings around after removal</li> </ol>	<ol style="list-style-type: none"> <li>Wear proper PPE (nitrile gloves, Tyvek sleeves)</li> <li>Wear proper PPE (safety glasses)</li> </ol>
31. Set-up plastic sheeting for work site around the well	<ol style="list-style-type: none"> <li>Lacerations when cutting plastic sheeting</li> </ol>	<ol style="list-style-type: none"> <li>Use scissors to cut plastic sheeting / Cut motions should always be away from body and body parts</li> </ol>

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
32. Measure depth to water	<ol style="list-style-type: none"> <li>1. Exposure to hazardous substances through inhalation or dermal exposure</li> <li>2. Pinch fingers or hand in water level instrument</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (nitrile gloves)</li> <li>2. Wear proper PPE (leather gloves)</li> </ol>
33. Calibrate monitoring equipment	<ol style="list-style-type: none"> <li>1. Skin or eye contact with calibration chemicals</li> <li>2. Pinch fingers or hand in monitoring equipment</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (safety glasses, nitrile gloves)</li> <li>2. Wear proper PPE (leather gloves) / Avoid pinch points</li> </ol>
34. Install sampling pump in well	<ol style="list-style-type: none"> <li>1. Hand injuries during installation of pump</li> <li>2. Lacerations when cutting tubing</li> <li>3. Back strain during installation of pump</li> <li>4. Physical hazards associated with manual lifting of heavy equipment</li> <li>5. Back strain from starting generator</li> <li>6. Burns from hot exhaust from generator</li> <li>7. Electrical shock from improper use of generator and pump</li> <li>8. Contaminated water spray from loose connections</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (leather gloves, nitrile gloves)</li> <li>2. Use safety tubing cutter</li> <li>3. Use proper lifting techniques</li> <li>4. Use proper lifting techniques / Use wheeled transport for heavy equipment</li> <li>5. Use arm when starting generator / Do not over-strain if generator does not start</li> <li>6. Do not touch generator near exhaust / Use proper handle to carry / Allow generator to cool down before moving</li> <li>7. Properly plug in pump to generator / Do not allow the pump or generator to contact water / Check for breaks in the cord</li> <li>8. Check all tubing connections to ensure they are tight and secure</li> </ol>

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
10. Purge water	<ol style="list-style-type: none"> <li>1. Contact with potentially contaminated groundwater</li> <li>2. Back strain from lifting buckets of water</li> <li>3. Tripping potential on sample discharge lines and pump electric line</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (safety glasses, nitrile gloves)</li> <li>2. Use proper lifting techniques / Use wheeled transport</li> <li>3. Organize discharge of electric line to keep out of way as much as possible / Mark potential tripping hazards with caution tape or safety cones</li> </ol>
11. Sample water collection	<ol style="list-style-type: none"> <li>1. Contact with potentially contaminated groundwater through dermal exposure</li> <li>2. Contact with and burns from acid used for sample preservation</li> <li>3. Tripping potential on sample discharge lines and pump electric line</li> <li>4. Lacerations from broken sample bottles</li> <li>5. Back strain when transporting coolers full of collected samples</li> <li>6. Slips/ Trips/ Falls</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (safety glasses, nitrile gloves)</li> <li>2. Wear proper PPE (safety glasses, nitrile gloves) / Ensure sample bottle lids are secure before use and after sample collection</li> <li>3. Organize line to keep out of the way as much as possible / Mark potential tripping hazards with caution tape or safety cones</li> <li>4. Do not over-tighten bottle caps / Handle bottles safely to prevent breakage / Wrap glass bottles in bubble wrap, if possible</li> <li>5. Use proper lifting techniques / Use wheeled transport / Seek assistance if coolers weight exceeds 50lbs. / Minimize distance to vehicle</li> <li>6. Have unobstructed path to vehicle or collection point / Follow good housekeeping procedures / Do not lift/walk with coolers that are too heavy/difficult to lift</li> </ol>
12. Remove pump and pack up equipment	<ol style="list-style-type: none"> <li>1. Back strain when removing pump or lifting heavy equipment</li> </ol>	<ol style="list-style-type: none"> <li>1. Use proper lifting technique / Use wheeled transport for heavy equipment</li> </ol>
13. Replace well cap and lock	<ol style="list-style-type: none"> <li>1. Scrape fingers/hand</li> <li>2. Strain wrist/bruise palm</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (leather gloves)</li> <li>2. Using hammer, tap the end of the well cap to tighten grip</li> </ol>
14. Replace well cover	<ol style="list-style-type: none"> <li>1. Scrape knuckles/hand</li> <li>2. Strain wrist/bruise palm</li> <li>3. Pinch fingers or hand</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (leather gloves)</li> <li>2. Using hammer, tap the end of the wrench to tighten the grip of the bolts</li> <li>3. Wear proper PPE (leather gloves)</li> </ol>
15. Transport drums to disposal staging location	<ol style="list-style-type: none"> <li>1. Back, arm or shoulder strain from moving drums</li> <li>2. Pinch hazard</li> <li>3. Contact with potentially contaminated groundwater when moving improperly sealed drums</li> <li>4. Slips/ Trips/ Falls when moving drum</li> <li>5. Drop drum on feet/toes</li> </ol>	<ol style="list-style-type: none"> <li>1. Use drum cart for moving drums / Use proper lifting techniques / Obtain assistance, if needed</li> <li>2. Wear proper PPE (leather gloves)</li> <li>3. Wear proper PPE (nitrile gloves under leather gloves) / Properly seal drum to prevent leak</li> <li>4. Ensure route to move drum to storage space is dry and free from obstructions</li> <li>5. Wear proper PPE (safety shoes)</li> </ol>
16. Place used PPE in designated disposal drum	<ol style="list-style-type: none"> <li>1. Pressure build-up inside drum</li> <li>2. Pinch hazard</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove cap from bung hole in drum to relieve pressure</li> <li>2. Wear proper PPE (leather gloves)</li> </ol>
17. Decontaminate equipment	<ol style="list-style-type: none"> <li>1. Splashing water/soap from decontamination</li> <li>2. Contact with potentially contaminated groundwater through dermal exposure</li> <li>3. Electrical shock from broken electric cords</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear proper PPE (safety glasses)</li> <li>2. Wear proper PPE (safety glasses, dermal protection)</li> <li>3. Properly plug in pump to generator / Do not allow the pump or generator to contact water / Check for breaks in the cord</li> </ol>
18. All activities	<ol style="list-style-type: none"> <li>41. Slips/ Trips/ Falls</li> <li>42. Hand injuries, cuts or lacerations during manual handling of materials</li> <li>43. Foot injuries</li> <li>44. Back injuries</li> <li>45. Traffic</li> <li>46. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>47. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards</li> <li>48. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves</li> <li>49. Wear Langan approved safety shoes</li> </ol>



JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	47. High Noise levels 48. Overhead hazards 49. Heat Stress/ Cold Stress 50. Eye Injuries	50. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 51. Wear high visibility clothing & vest / Use cones or signs to designate work area 52. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 53. Wear hearing protection 54. Wear hard hat / Avoid areas where overhead hazards exist. 55. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 56. Wear safety glasses
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><i>Prepared by:</i></b>		
<b><i>Reviewed by:</i></b>		


# LANGAN

## Job Safety Analysis (JSA) Health and Safety

JSA Title: Well Installation  
JSA Number: JSA019-01

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



- S** – Stop, what has changed?
- T** – Think about the task
- E** – Evaluate potential hazards
- P** – Plan safe approach
- S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT REQUIRED:

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input checked="" type="checkbox"/> Other: PID, Tyvek sleeves				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
35. Move equipment to work site	19. Back strain when lifting equipment 20. Slips/ Trips/ Falls while moving equipment 21. Traffic (if applicable) 22. Pinched fingers or running over toes during geoprobe set-up 23. Overturn drilling rig while transporting to loading dock on flat-bed tow truck	13. Use proper lifting technique (use legs for bending and lifting and not the back)/ Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle 14. Use proper lifting technique (use legs for bending and lifting and not the back) / Use wheeled transport for heavy equipment / Get assistance when handling loads greater than 50 lbs. / Minimize distance to vehicle / Have unobstructed path to vehicle or collection point / Do not lift/walk with boxes that are heavy/difficult to lift 15. Wear high visibility safety vests or clothing / Exercise caution 16. Wear proper PPE (cut-resistant gloves) / Stay alert, be aware of geoprobe rig at all times 17. Drill rig should be parked in center of flat-bed tow truck / Emergency brake shall be used at all times during transport on the flat-bed truck/ All unnecessary personnel should stay away from the flat-bed truck during moving activities
36. Calibration of monitoring equipment	13. Skin or eye contact with calibration chemicals 14. Pinch fingers in monitoring equipment	8. Wear proper PPE (safety glasses/ goggles) 9. Wear proper PPE (leather gloves)
10. Set-up geoprobe rig	14. Geoprobe rig movement	8. All field personnel should stay clear of the geoprobe rig while moving / Use a spotter when backing up the geoprobe
11. Advance geoprobe rods below ground surface to desired depth	4. Underground utilities 5. High noise levels	4. Clean all subsurface soil borings to a minimum of 5 feet below grade 5. Wear proper PPE (hearing protection)

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
12. Remove and open acetate liner  5. Remove and open acetate liner (cont'd)	51. Pinched fingers while removing macrocore 52. Cuts/lacerations when cutting acetate liner open 53. Exposure to hazardous vapors 54. Skin contact with contaminated soil	1. Wear proper PPE (nitrile gloves, cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Do not place face over acetate liner when opening / Monitor hazardous vapors in air with PID / Upgrade PPE as necessary based on levels contained in the Health and Safety Plan 4. Wear proper PPE (nitrile gloves)
6. Remove excess soil from acetate liner and place in 55-gallon drum (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Cuts/lacerations from acetate liner 2. Pinched fingers/hand while opening/closing drum 3. Skin contact with contaminated soil 4. Soil debris in eyes	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (nitrile gloves) 4. Wear proper PPE (safety glasses)
7. Attach hollow-stem augers to the geoprobe rig; Advance augers and attach additional augers until desired depth is reached	1. Strain wrist/bruise palm 2. Pinched fingers 3. Back Strain 4. Clothing entanglement 5. Carbon monoxide poisoning 6. Bruise toes/foot 7. High noise levels 8. Skin contact with contaminated soil	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Use proper lifting techniques 4. Wear proper work attire(no loose clothing/strings) 5. Properly ventilate work area 6. Wear proper PPE (safety shoes) 7. Wear proper PPE (hearing protection) 8. Wear proper PPE (Tyvek sleeves, nitrile gloves)
8. Install monitoring well	1. Pinched fingers 2. Lacerations/abrasions 3. Back Strain	1. Wear proper PPE (cut-resistant or leather gloves) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Use proper lifting techniques
9. Tremie-grout annulus space above bentonite seal	1. Back strain 2. Pinched fingers	1. Use proper lifting techniques 2. Wear proper PPE (cut-resistant or leather gloves)
10. Install flush-mount monitoring well pad	1. Splashed concrete 2. Pinched fingers 3. Cuts/lacerations	1. Wear proper PPE (safety glasses) 2. Wear proper PPE (cut-resistant or leather gloves) 3. Wear proper PPE (cut-resistant or leather gloves)
11. Decontaminate equipment	1. Splashing water/soap 2. Contact with potentially contaminated groundwater/soil through dermal exposure 3. Electrical shock from broken electric cords	1. Wear proper PPE (safety glasses) 2. Wear proper PPE (safety glasses, dermal protection) 3. Properly plug in pump to generator / Do not allow the pump or generator to contact water / Check for breaks in the cord
12. Transport drums to central staging location (IF NOT PERFORMED BY LANGAN, REMOVE!)	1. Back, arm or shoulder strain from moving drums 2. Pinch fingers/hand in drum cart when moving drums 3. Pinch fingers/hand when operating lift-gate on vehicle 4. Contact with potentially contaminated groundwater when moving improperly sealed drums 5. Slips when moving drums 6. Drop drum on feet/toes	57. Use drum cart for moving drums / Use proper lifting techniques / Do not lift heavy loads without assistance 58. Wear proper PPE (cut-resistant or leather gloves)  59. Wear proper PPE (cut-resistant or leather gloves)  60. Wear proper PPE (nitrile gloves underneath work gloves)  61. Follow good housekeeping procedures / Ensure route to move drum and storage space is free from obstructions 62. Wear proper PPE (safety shoes) / Work in a safe manner to prevent dropped drum

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
13. All activities  13. All activities (cont'd)	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 5. Traffic 6. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 7. High Noise levels 8. Overhead hazards 9. Heat Stress/ Cold Stress 10. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas where overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Take breaks as necessary to avoid heat/cold stress 10. Wear safety glasses
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><u>Prepared by:</u></b>		
<b><u>Reviewed by:</u></b>		


# LANGAN

## Job Safety Analysis (JSA) Health and Safety

JSA Title: **Monitoring Well Development**  
JSA Number: **JSA026-01**

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



- S** – Stop, what has changed?
- T** – Think about the task
- E** – Evaluate potential hazards
- P** – Plan safe approach
- S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Goggles	<input checked="" type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input checked="" type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input checked="" type="checkbox"/> Other: Tyvek Sleeves				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
37. Transport equipment to work area	24. Back Strains 25. Slips/Trips/Falls 26. Traffic 27. Cuts/Abrasions/Contusions from equipment	18. Use proper lifting techniques/ Use wheeled transport/ use buddy system when lifting equipment. 19. Minimize distance from work area/ unobstructed path to collection points and vehicle/ Follow good housekeeping procedures. 20. Wear high-visibility vest or clothing/Exercise caution/ Use traffic cones or signage if needed. 21. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes).
38. Measure depth of water	15. Exposure to hazardous substances 16. Pinched fingers	13. Wear proper PPE (Nitrile gloves, Safety glasses/Face shield). 14. Wear proper PPE (cut-resistant gloves).
39. Install Tremie pipe in the monitoring well and connect to water source.	15. Hand injuries during installation (pinched fingers/hands). 16. Back strain from holding Tremie pipe. 17. High pressure water spray.	9. Wear proper PPE (Nitrile gloves/cut-resistant gloves). 10. Use proper lifting techniques/ Use two personnel when lowering pump greater than 80 feet. 11. Ensure all hose connections are tight and secure/ Use proper PPE (face shield and safety glasses).
40. Install pump in to well a. Connect pump to sample tubing. b. Lower pump to desired depth in well. c. Connect sample tubing to flow cell d. Connect pump to power source	6. Hand injuries during pump installation and sample tubing cutting. 7. Back strain 8. Electric shock 9. Exhaust gases from generator 10. Burns from hot equipment	6. Wear proper PPE when installing pump and cutting sample tubing (Nitrile and cut-resistant gloves)/ Use tubing cutter. 7. Proper lifting techniques/ Two personnel when installing pump at depths greater than 80 feet/ Use buddy when lifting heavy loads (pump, generator)/Use wheeled transport. 8. Ensure equipment is ( LO/TO: locked out/tagged out) prior to performing any electrical connections/ Inspect wires for frays or cuts/Ensure generator is properly grounded prior to starting.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
(generator) e. Turn on power source (generator)		9. Position generator so that exhaust is flowing away from work area. 10. Do not touch exhaust or any hot part of generator/ Allow equipment time to cool down prior to carrying/ Use proper PPE (long sleeves, leather gloves)
41. Develop monitoring well a. Jet water into well using Tremie pipe b. Turn pump on and adjust to desired flow rate. c. Surge pump up and down well to remove sediment from screen d. Containerize all purge water from well.	55. Hand injuries 56. Face injuries 57. Contaminated spray from water	63. Wear proper PPE (cut-resistant gloves and nitrile gloves). 64. Wear proper PPE (face shield and safety glasses)/do not stand over well opening. 65. Wear proper PPE (Face shield and safety goggles)/Tyvek over garments/ Ensure all connections are secure and tight/ Tubing outlet is contained in an overflow container.
42. Drum staging area.	1. Back, Arm, and shoulder strain. 2. Pinch points 3. Cross contamination 4. Slip/Trips/Falls	1. Use proper lifting techniques/ Use drum carts when moving drums/ use buddy system for moving of drums if needed/Move drums shortest distance needed. 2. Keep fingers and feet away from pinch points/ Use proper PPE (cut-resistant gloves, Langan approved safety shoes) 3. Use proper PPE (Nitrile gloves, Tyvek sleeves) 4. Ensure pathway is clear prior to moving equipment/ Mark all hazards/ Use additional person as a spotter if needed.
43. Equipment pack-up	1. Back Strains 2. Slips/Trips/Falls 3. Traffic 4. Cuts/Abrasions/Contusions from equipment.	1. Use proper lifting techniques/ Use wheeled transport/ use buddy system when lifting equipment. 2. Minimize distance from work area/ Unobstructed path to collection points and vehicle/ Follow good housekeeping procedures. 3. Wear high-visibility vest or clothing/Exercise caution/ Use traffic cones or signage if needed. 66. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes).
44. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 58. Back injuries 59. Traffic 60. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 61. High Noise levels 62. Overhead hazards 63. Heat Stress/ Cold Stress 64. Eye Injuries	1. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 2. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 3. Wear Langan approved safety shoes 4. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 5. Wear high visibility clothing & vest / Use cones or signs to designate work area 6. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellent / Use bug spray when needed 7. Wear hearing protection 8. Wear hard hat / Avoid areas were overhead hazards exist. 9. Wear proper attire for weather conditions (sunscreen or protective clothing)



JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 10. Wear safety glasses.
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><i>Prepared by:</i></b>		
<b><i>Reviewed by:</i></b>		

# LANGAN

## Job Safety Analysis (JSA) Health and Safety

**JSA Title:** Groundwater/Product Purging/Sampling with Bailer  
**JSA Number:** JSA053

A Job Safety Analysis (JSA) must identify all job steps required to complete the task, the potential hazards employees could be exposed to while performing the job step and the preventative/corrective actions required to reduce/mitigate the identified potential hazards. Employees must certify that they have either prepared the JSA or have reviewed the JSA and are aware of the potential hazards associated with this task and will follow the provided preventive/corrective actions. Prior to the start of any work "TAKE 5" and conduct a Last Minute Risk Assessment.



- S** – Stop, what has changed?
- T** – Think about the task
- E** – Evaluate potential hazards
- P** – Plan safe approach
- S** – Start task / Stop & regroup

### PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

<input checked="" type="checkbox"/> Safety Shoes	<input checked="" type="checkbox"/> Long Sleeves	<input checked="" type="checkbox"/> Safety Vest (Class 2)	<input checked="" type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Hearing Protection
<input checked="" type="checkbox"/> Safety Glasses	<input checked="" type="checkbox"/> Safety Goggles	<input checked="" type="checkbox"/> Face Shield	<input checked="" type="checkbox"/> Nitrile Gloves	<input checked="" type="checkbox"/> PVC Gloves
<input checked="" type="checkbox"/> Leather Gloves	<input type="checkbox"/> Cut Resist. Gloves	<input type="checkbox"/> Fall Protection	<input checked="" type="checkbox"/> Fire Resistant Clothing	<input type="checkbox"/> Rubber Boots
<input type="checkbox"/> Insect/Animal Repellent	<input type="checkbox"/> Ivy Blocker/Cleaner	<input checked="" type="checkbox"/> Traffic Cones/Signs	<input type="checkbox"/> Life Vest/Jacket	
<input checked="" type="checkbox"/> Other: Tyvek sleeves, Dermal Protection, PID, absorbent pads				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
45. Transport equipment to work area	6. Back Strain 7. Slips/ Trips/ Falls 8. Traffic 9. Cuts/abrasions from equipment 10. Contusions from dropped equipment	6. Use proper lifting techniques / Use wheeled transport 7. Minimize distance to work area / Have unobstructed path to work area / Follow good housekeeping procedures 8. Wear proper PPE (high visibility vest or clothing) 9. Wear proper PPE (leather gloves, long sleeves) 10. Wear proper PPE (safety shoes)
46. Remove well cover	17. Scrape knuckles/hand 18. Strain wrist/bruise palm 19. Pinch fingers or hand	6. Wear proper PPE (leather gloves) 7. Using a hammer, tap the end of the wrench to loosen grip of bolts 8. Wear proper PPE (leather gloves)
47. Remove well cap and lock	18. Well can pops from pressure 19. Exposure to hazardous substances through inhalation or dermal exposure 20. Scrape knuckles/hand 21. Pinch points 22. Strain wrist/bruise palm	9. Remove cap slowly to relieve pressure / Do not place face over well when opening / Wear proper PPE (safety glasses, face shield, hand protection) 10. Use direct air monitoring/reading instrument (i.e. PID) / Be familiar with and follow actions prescribed in the HASP / Wear proper PPE (nitrile gloves) 11. Wear proper PPE (leather gloves) 12. Using hammer, tap the end of the wrench to loosen grip
48. Measure head-space vapor levels	2. Exposure to hazardous substances through inhalation	2. Do not place face over well when collecting measurement
49. Set-up plastic sheeting/absorbent pads	2. Lacerations when cutting plastic sheeting/absorbent pads	2. Use scissors to cut plastic sheeting/absorbent pads / Cut motions should always be away from body and body parts

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
for work site around the well		
50. Lower Bailer sleeve into well	7. Repetitive motion injury (pulled arm/back muscles) 8. Dehydration	7. Take breaks while lowering bailer into well/ Use a mechanical device to lower bailer into well/ Rotate employees (take turns conducting the manual labor portion) 8. Take breaks and drink water.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
7. Purge/Sample water/product collection	1. Contact with potentially contaminated groundwater or product through dermal exposure 2. Contact with and burns from acid used for sample preservation 9. Tripping potential on sampling lanyard 10. Lacerations from broken sample bottles 11. Back strain when transporting coolers full of collected samples 12. Slips/ Trips/ Falls	1. Wear proper PPE (safety glasses, nitrile gloves, safety shield, Tyvek) 2. Ensure sample bottle lids are secure before use and after sample collection 3. Organize lanyard to keep out of the way as much as possible / Mark potential tripping hazards with caution tape or safety cones 9. Do not over-tighten bottle caps / Handle bottles safely to prevent breakage / Wrap glass bottles in bubble wrap, if possible 10. Use proper lifting techniques / Use wheeled transport / Seek assistance if coolers weight exceeds 50lbs. / Minimize distance to vehicle 11. Have unobstructed path to vehicle or collection point / Follow good housekeeping procedures / Do not lift/walk with coolers that are too heavy/difficult to lift
8. Retrieval of bailer	9. Repetitive motion injury (pulled arm/back muscles) 10. Dehydration	9. Take breaks while retrieving bailer out of the well/ Use a mechanical device to raise bailer out of well/ Rotate employees (take turns conducting the manual labor portion) 10. Take breaks and drink water.
9. Pack-up equipment	2. Back strain when removing or lifting heavy equipment	2. Use proper lifting technique / Use wheeled transport for heavy equipment
10. Replace well cap and lock	3. Scrape fingers/hand 4. Strain wrist/bruise palm	3. Wear proper PPE (leather gloves) 4. Using hammer, tap the end of the well cap to tighten grip
11. Replace well cover	4. Scrape knuckles/hand 5. Strain wrist/bruise palm 6. Pinch fingers or hand	4. Wear proper PPE (leather gloves) 5. Using hammer, tap the end of the wrench to tighten the grip of the bolts 6. Wear proper PPE (leather gloves)
12. Place used PPE in designated disposal drum	3. Pressure build-up inside drum 4. Pinch hazard	3. Remove cap from bung hole in drum to relieve pressure 4. Wear proper PPE (leather gloves) 5. Product drums may require additional spill protection/electrical grounding, check local regulations
13. Decontaminate equipment	4. Splashing water/soap from decontamination 5. Contact with potentially contaminated groundwater through dermal exposure	4. Wear proper PPE (safety glasses) 5. Wear proper PPE (safety glasses, dermal protection)

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
14. All activities	65. Slips/ Trips/ Falls 66. Hand injuries, cuts or lacerations during manual handling of materials 67. Foot injuries 68. Back injuries 69. Traffic 70. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 71. High Noise levels 72. Overhead hazards 73. Heat Stress/ Cold Stress 74. Eye Injuries	67. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 68. Inspect for jagged/sharp edges, and rough or slippery surfaces / Keep fingers away from pinch points / Wipe off greasy, wet, slippery or dirty objects before handling / Wear leather/ cut-resistant gloves 69. Wear Langan approved safety shoes 70. Use proper lifting techniques / Consider load location, task repetition, and load weigh when evaluating what is safe or unsafe to lift / Obtain assistance when possible 71. Wear high visibility clothing & vest / Use cones or signs to designate work area 72. Be aware of surroundings at all times, including the presence of wildlife/ Do not approach stray dogs / Carry/use dog/animal repellant / Use bug spray when needed 73. Wear hearing protection 74. Wear hard hat / Avoid areas were overhead hazards exist. 75. Wear proper attire for weather conditions (sunscreen or protective clothing in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress 76. Wear safety glasses
Additional items.		
Additional Items identified while in the field.  (Delete row if not needed.)		

<u>Print Name</u>	<u>Sign Name</u>	<u>Date</u>
<b><u>Prepared by:</u></b>		
<b><u>Reviewed by:</u></b>		


# **ATTACHMENT H**

## **TAILGATE SAFETY BRIEFING FORM**

## **LANGAN TAILGATE SAFETY BRIEFING**

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Leader: \_\_\_\_\_

Location: \_\_\_\_\_

Work Task:

\_\_\_\_\_

\_\_\_\_\_

### **SAFETY TOPICS (provide some detail of discussion points)**

Chemical Exposure Hazards and Control: \_\_\_\_\_

\_\_\_\_\_

Physical Hazards and Control: \_\_\_\_\_

Air Monitoring: \_\_\_\_\_

PPE: \_\_\_\_\_

\_\_\_\_\_

Communications: \_\_\_\_\_

Safe Work Practices: \_\_\_\_\_

\_\_\_\_\_

Emergency Response: \_\_\_\_\_

Hospital/Medical Center Location: \_\_\_\_\_

Phone Nos.: \_\_\_\_\_

Other: \_\_\_\_\_

### **FOR FOLLOW-UP** (the issues, responsibilities, due dates, etc.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### **ATTENDEES**

PRINT NAME	COMPANY	SIGNATURE



**APPENDIX H**  
**QUALITY ASSURANCE PROJECT PLAN**

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# QUALITY ASSURANCE PROJECT PLAN

for

**27-01 JACKSON AVENUE  
Block 432, Lot 21  
Long Island City, New York  
NYSDEC BCP Site No. C241209**

**Prepared For:**

**2701 JACKSON LLC  
425 Northern Boulevard  
Great Neck, NY 11021**

*Prepared By:*

**Langan Engineering, Environmental, Surveying,  
Landscape Architecture, and Geology, D.P.C.**

**21 Penn Plaza  
360 West 31st Street, 8th Floor  
New York, New York 10001**

**LANGAN**

**August 2022  
Langan Project No. 170472002**

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Attachment B:	Laboratory Reporting Limits and Method Detection Limits
Attachment C:	Analytical Methods/Quality Assurance Summary Table
Attachment D:	Sample Nomenclature

## **1.0 PROJECT DESCRIPTION**

### **1.1 INTRODUCTION**

This Quality Assurance Project Plan (QAPP) is for the southern- and western-adjointing sidewalks along Jackson Avenue and 43rd Avenue associated with the property located at 27-01 Jackson Avenue in the Long Island City neighborhood of Queens, New York (the site). The property located at 27-01 Jackson Avenue was remediated pursuant to an executed Brownfield Cleanup Agreement (dated September 17, 2018) and subsequent amendment (approved July 28, 2021) between the New York State Department of Environmental Conservation (NYSDEC) and the Participant for New York State Brownfield Cleanup Program (BCP) site No. C241209. The BCP site achieved a Track 1 cleanup meeting the 6 New York Code, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use Soil Cleanup Objectives (SCO); however, residual petroleum-related volatile organic compound (VOC) impacts remain in soil and groundwater beneath the southern- and western-adjointing sidewalks along Jackson Avenue and 43rd Avenue associated with BCP Site No. C241209, which is hereafter referred to as “the site”. Institutional Controls (IC) and Engineering Controls (EC) have been established to control exposure to remaining VOC impacts at the site to ensure protection of public health and the environment.

Additional details are provided in the Site Management Plan (SMP).

This QAPP specifies analytical methods to be used to ensure that data collected during site management are precise, accurate, representative, comparable, complete, and meet the sensitivity requirements of the project.

### **1.2 PROJECT OBJECTIVES**

Groundwater sampling will be performed at the site to monitor the treatment and reduction of petroleum-related VOC contamination in groundwater. Post-injection monitoring will continue on a quarterly basis to evaluate the efficacy of the remedy.

### **1.3 SCOPE OF WORK**

The specific scope of work for groundwater monitoring at the site is described in detail in the SMP. The following samples will be collected as part of SMP implementation:

- Groundwater sampling from four monitoring wells to assess the performance of the remedy for petroleum-related VOCs

## 2.0 DATA QUALITY OBJECTIVES AND PROCESS

Data Quality Objectives (DQOs) are qualitative and quantitative statements to help ensure that data of known and appropriate quality are obtained during the project. DQOs for sampling activities are determined by evaluating five factors:

- Data needs and uses: The types of data required and how the data will be used after it is obtained.
- Parameters of Interest: The types of chemical or physical parameters required for the intended use.
- Level of Concern: Levels of constituents, which may require remedial actions or further investigations.
- Required Analytical Level: The level of data quality, data precision, and quality assurance/quality control (QA/QC) documentation required for chemical analysis.
- Required Detection Limits: The detection limits necessary based on the above information.

The quality assurance and quality control objectives for all measurement data include:

- **Precision** – an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Field sampling precision will be determined by analyzing field duplicate samples and analytical precision will be determined by analyzing laboratory control sample duplicates and/or matrix spike duplicates.
- **Accuracy** – a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern. For groundwater samples, accuracy will be determined through the assessment of the analytical results of field blanks and trip blanks for each sample set. Analytical accuracy will be assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), internal standards, laboratory method blanks, instrument calibration, and the percent recoveries of matrix spike compounds added to selected samples and laboratory blanks.
- **Representativeness** – expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is dependent upon the adequate design of the sampling program and will be satisfied by ensuring that the scope of work is followed and that specified sampling and

analysis techniques are used. Representativeness in the laboratory is ensured by compliance to nationally-recognized analytical methods, meeting sample holding times, and maintaining sample integrity while the samples are in the laboratory's possession. This is accomplished by following all applicable methods, laboratory-issued standard operating procedures (SOPs), the laboratory's Quality Assurance Manual, and this QAPP. The laboratory is required to be properly certified and accredited.

- **Completeness** – the percentage of measurements made which are judged to be valid. Completeness will be assessed through data validation. The quality control (QC) objective for completeness is generation of valid data for at least 90 percent of the analyses requested.
- **Comparability** – expresses the degree of confidence with which one data set can be compared to another. The comparability of all data collected for this project will be ensured using several procedures, including standard methods for sampling and analysis as documented in the QAPP, using standard reporting units and reporting formats, and data validation.
- **Sensitivity** – the ability of the instrument or method to detect target analytes at the levels of interest. The project manager will select, with input from the laboratory and quality assurance (QA) personnel, sampling and analytical procedures that achieve the required levels of detection.

The above objectives are discussed in detail in Section 4.0.

### 3.0 PROJECT ORGANIZATION

Implementation of post-remediation media monitoring and sampling as outlined in the SMP will be overseen by Langan or another environmental consultant on behalf of the Participant or a future owner. The environmental consultant will also arrange data analysis and reporting tasks. The analytical services will be performed by an Environmental Laboratory Accreditation Program (ELAP)-certified laboratory. Data validation services will be performed by approved data validation contractor(s).

Key contacts for this project are as follows:

2701 Jackson LLC:	Mr. Albert Shirian Telephone: (516) 829-5883
Remediation Engineer:	Mr. Jason Hayes, P.E. Telephone: (212) 479-5400
Langan Project Director:	Ms. Mimi Raygorodetsky Telephone: (212) 479-5400
Langan Project Manager:	Mr. Brian Gochenaur Telephone: (212) 479-5479
Langan Field Team Leader:	Ms. Kimberly Semon Telephone: (212) 479-5486
Langan Quality Assurance Officer (QAO):	Mr. Michael D. Burke, PG, CHMM Telephone: (212) 479-5400
Langan Health and Safety Manager:	Mr. Tony Moffa, CHMM Telephone: (215) 491-6500
Langan Health and Safety Officer:	Mr. William Bohrer Telephone: (410) 984-3068
Data Validator:	Mr. Joseph Conboy Telephone: (609) 282-8055
Laboratory Representative:	Mr. Ben Rao (Alpha) Telephone: (201) 847-2951
Field Personnel:	TBD

Langan résumés are provided as Attachment A.



## **4.0 QUALITY ASSURANCE OBJECTIVES FOR COLLECTION OF DATA**

The overall quality assurance and quality control objectives for all measurement data include precision, accuracy, representativeness, completeness, comparability, and sensitivity. These objectives are defined in following subsections. Variances from the quality assurance objectives at any stage of the investigation will result in the implementation of appropriate corrective measures and an assessment of the impact of corrective measures on the usability of the data.

### **4.1 PRECISION**

Precision is a measure of the degree to which two or more measurements are in agreement. Field precision is assessed through the collection and measurement of field duplicates. Laboratory precision and sample heterogeneity also contribute to the uncertainty of field duplicate measurements. This uncertainty is taken into account during the data assessment process. For field duplicates, results less than 5x the reporting limit (RL) meet the precision criteria if the absolute difference is less than  $\pm 1x$  the RL for groundwater and acceptable based on professional judgement. For results greater than 5x the RL, the acceptance criteria is a relative percent difference (RPD) of <30% (water). RLs and method detection limits (MDL) are provided in Attachment B.

### **4.2 ACCURACY**

Accuracy is the measurement of the reproducibility of the sampling and analytical methodology. It should be noted that precise data may not be accurate data. For the purpose of this QAPP, bias is defined as the constant or systematic distortion of a measurement process, which manifests itself as a persistent positive or negative deviation from the known or true value. This may be due to (but not limited to) improper sample collection, sample matrix, poorly calibrated analytical or sampling equipment, or limitations or errors in analytical methods and techniques.

Accuracy in the field is assessed through the use of trip and field blanks and through compliance to all sample handling, preservation, and holding time requirements. All field blanks should be non-detect when analyzed by the laboratory. Any contaminant detected in an associated field blank will be evaluated against laboratory blanks (preparation or method) and evaluated against field samples collected on the same day to determine potential for bias. Trip blanks are not required for non-aqueous matrices but are planned for non-aqueous matrices where high concentrations of VOCs are anticipated.

Laboratory accuracy is assessed by evaluating the percent recoveries of matrix spike/matrix spike duplicate (MS/MSD) samples, laboratory control samples (LCS), surrogate compound recoveries, and the results of method preparation blanks. MS/MSD, LCS, and surrogate percent recoveries will be compared to either method-specific control limits or laboratory-derived control limits. Sample volume permitting, samples displaying outliers should be reanalyzed. All associated method blanks should be non-detect when analyzed by the laboratory.

### **4.3 COMPLETENESS**

Laboratory completeness is the ratio of total number of samples analyzed and verified as acceptable compared to the number of samples submitted to the fixed-base laboratory for analysis, expressed as a percent. Three measures of completeness are defined:

- Sampling completeness, defined as the number of valid samples collected relative to the number of samples planned for collection;
- Analytical completeness, defined as the number of valid sample measurements relative to the number of valid samples collected; and
- Overall completeness, defined as the number of valid sample measurements relative to the number of samples planned for collection.

Groundwater data will meet a 90% completeness criterion. If the criterion is not met, sample results will be evaluated for trends in rejected and unusable data. The effect of unusable data required for a determination of compliance will also be evaluated.

### **4.4 REPRESENTATIVENESS**

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. Representativeness is dependent upon the adequate design of the sampling program and will be satisfied by ensuring that the scope of work is followed and that specified sampling and analysis techniques are used. This is performed by following applicable SOPs and this QAPP. All field technicians will be given copies of appropriate documents prior to sampling events and are required to read, understand, and follow each document as it pertains to the tasks at hand.

Representativeness in the laboratory is ensured by compliance to nationally-recognized analytical methods, meeting sample holding times, and maintaining sample integrity while the samples are in the laboratory's possession. This is performed by following all applicable United States Environmental Protection Agency (USEPA) analytical methods, laboratory-issued SOPs, the laboratory's Quality Assurance Manual, and this QAPP. The laboratory is required to be properly certified and accredited.

#### **4.5 COMPARABILITY**

Comparability is an expression of the confidence with which one data set can be compared to another. The comparability of all data collected for this project will be ensured by:

- Using identified standard methods for both sampling and analysis phases of this project;
- Requiring traceability of all analytical standards and/or source materials to the USEPA or National Institute of Standards and Technology (NIST);
- Requiring that all calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable);
- Using standard reporting units and reporting formats including the reporting of QC data;
- Performing a complete data validation on a representative fraction of the analytical results, including the use of data qualifiers in all cases where appropriate; and
- Requiring that all validation qualifiers be used any time an analytical result is used for any purpose.

These steps will ensure all future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

#### **4.6 SENSITIVITY**

Sensitivity is the ability of the instrument or method to detect target analytes at the levels of interest. The project director will select, with input from the laboratory and QA personnel, sampling and analytical procedures that achieve the required levels of detection and QC acceptance limits that meet established performance criteria. Concurrently, the project director will select the level of data assessment to ensure that only data meeting the project DQOs are used in decision-making.

Field equipment will be used that can achieve the required levels of detection for analytical measurements in the field. In addition, the field sampling staff will collect and submit full volumes of samples as required by the laboratory for analysis, whenever possible. Full volume aliquots will help ensure achievement of the required limits of detection and allow for reanalysis if necessary. The concentration of the lowest level check standard in a multi-point calibration curve will represent the reporting limit.

Analytical methods and quality assurance parameters associated with the sampling program are presented in Attachment C. The frequency of associated field blanks and duplicate samples will be based on the recommendations listed in NYSDEC Division of Environmental Remediation (DER)-10, and as described in Section 5.3.

Site-specific MS/MSD samples will be prepared and analyzed by the analytical laboratory by spiking an aliquot of submitted sample volume with analytes of interest. An MS/MSD analysis will be analyzed at a rate of 1 out of every 20 samples, or one per analytical batch. MS/MSD samples are only required for groundwater samples.

## **5.0 SAMPLE COLLECTION AND FIELD DATA ACQUISITION PROCEDURES**

Groundwater sampling will be conducted in accordance with the established NYSDEC protocols contained in DER-10/Technical Guidance for Site Investigation and Remediation (May 2010). The following sections describe procedures to be followed for specific tasks.

### **5.1 FIELD DOCUMENTATION PROCEDURES**

Field documentation procedures will include summarizing field data in field books and field data sheets, and proper sample labeling. These procedures are described in the following sections.

#### **5.1.1 Field Data and Notes**

Field notebooks contain the documentary evidence regarding procedures conducted by field personnel. Hard cover, bound field notebooks will be used because of their compact size, durability, and secure page binding. The pages of the notebook will not be removed.

Entries will be made in waterproof, permanent blue or black ink. No erasures will be allowed. If an incorrect entry is made, the information will be crossed out with a single strike mark and the change initialed and dated by the team member making the change. Each entry will be dated. Entries will be legible and contain accurate and complete documentation of the individual or sampling team's activities or observations made. The level of detail will be sufficient to explain and reconstruct the activity conducted. Each entry will be signed by the person(s) making the entry.

The following types of information will be provided for each sampling task, as appropriate:

- Project name and number
- Reasons for being on-site or taking the sample
- Date and time of activity
- Sample identification numbers
- Geographical location of sampling points with references to the site, other facilities or a map coordinate system. Sketches will be made in the field logbook when appropriate
- Physical location of sampling locations such as depth below ground surface
- Description of the method of sampling including procedures followed, equipment used and any departure from the specified procedures

- Description of the sample including physical characteristics, odor, etc.
- Readings obtained from health and safety equipment
- Weather conditions at the time of sampling and previous meteorological events that may affect the representative nature of a sample
- Photographic information including a brief description of what was photographed, the date and time, the compass direction of the picture and the number of the picture on the camera
- Other pertinent observations such as the presence of other persons on the site, actions by others that may affect performance of site tasks, etc.
- Names of sampling personnel and signature of persons making entries

Field records will also be collected on field data sheets including purge logs. Field data sheets will include the project-specific number and stored in the field project files when not in use. At the completion of the field activities, the field data sheets will be maintained in the central project file.

### 5.1.2 Sample Labeling

Each sample collected will be assigned a unique identification number in accordance with the sample nomenclature guidance included in Attachment D.

<b>Sample Nomenclature Summary</b>	
<b>DUP</b>	Field Duplicate
<b>FB</b>	Field Blank
<b>MW</b>	Monitoring Well
<b>TB</b>	Trip Blank
<b>MMDDYY</b>	Date of Sampling

Each sample container will have a sample label affixed to the outside with the date and time of sample collection and project name. In addition, the label will contain the sample identification number, analysis required and chemical preservatives added, if any. All documentation will be completed in waterproof ink.

## 5.2 EQUIPMENT CALIBRATION AND PREVENTATIVE MAINTENANCE

A photoionization detector (PID) will be used during the sampling activities to evaluate work zone action levels and collect monitoring well headspace readings. Field calibration and/or field checking of the PID will be the responsibility of the field team leader and the

site HSO, and will be accomplished by following the procedures outlined in the operating manual for the instrument. At a minimum, field calibration and/or field equipment checking will be performed once daily, prior to use. Field calibration will be documented in the field notebook. Entries made into the logbook regarding the status of field equipment will include the following information:

- Date and time of calibration
- Type of equipment serviced and identification number (such as serial number)
- Reference standard used for calibration
- Calibration and/or maintenance procedure used
- Other pertinent information

A water quality meter (Horiba U-52 or similar) will be used during purging of groundwater to measure pH, specific conductance, temperature, dissolved oxygen, turbidity and oxidation-reduction-potential (ORP), every five minutes. Water-quality meters should be calibrated and the results documented before use each day using standardized field calibration procedures and calibration checks.

Equipment that fails calibration or becomes inoperable during use will be removed from service and segregated to prevent inadvertent utilization. The equipment will be properly tagged to indicate that it is out of calibration. Such equipment will be repaired and recalibrated to the manufacturer's specifications by qualified personnel. Equipment that cannot be repaired will be replaced.

Off-site calibration and maintenance of field instruments will be conducted as appropriate throughout the duration of project activities. All field instrumentation, sampling equipment and accessories will be maintained in accordance with the manufacturer's recommendations and specifications and established field equipment practice. Off-site calibration and maintenance will be performed by qualified personnel. A logbook will be kept to document that established calibration and maintenance procedures have been followed. Documentation will include both scheduled and unscheduled maintenance.

### **5.3 SAMPLE COLLECTION**

#### *Groundwater Samples*

Groundwater sampling will be conducted using low-flow sampling procedures following USEPA guidance ("Low Stress [low flow] Purging and Sampling Procedure for the

Collection of Groundwater Samples from Monitoring Wells”, EQASOP-GW4, September 19, 2017).

During purging, field parameters should be measured, including: water level drawdown, purge rate, pH, specific conductance, temperature, dissolved oxygen, turbidity and ORP, every five minutes using a water quality meter (Horiba U-52 or similar) and a depth-to-water oil-water interface probe that should be decontaminated between wells. Samples should generally not be collected until the field parameters have stabilized. Field parameters will be considered stable once three sets of measurements are within  $\pm 0.1$  standard units for pH,  $\pm 3\%$  for conductivity and temperature,  $\pm 10$  millivolts for ORP, and  $\pm 10\%$  for turbidity and dissolved oxygen. Purge rates should be adjusted to keep the drawdown in the well to less than 0.3 feet, as practical. Additionally, an attempt should be made to achieve a stable turbidity reading of less than 10 Nephelometric Turbidity Units (NTU) prior to sampling. If the turbidity reading does not stabilize at reading of less than 10 NTU for a given well, then both filtered and unfiltered samples should be collected from that well. If necessary, field filtration should be performed using a 0.45 micron disposable in-line filter. Groundwater samples should be collected after parameters have stabilized as noted above or the readings are within the precision of the meter. Deviations from the stabilization and drawdown criteria, if any, should be noted on the sampling logs.

Samples should be collected directly into pre-cleaned laboratory-supplied jars. After collection, sample jars will be capped and securely tightened, and placed in iced coolers to attempt to maintain a temperature of  $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$  until they are transferred to the laboratory for analysis, in accordance with the procedures outlined in Section 5.4. Analysis and/or extraction and digestion of collected groundwater samples will meet the holding times required for each analyte as specified in Attachment C. In addition, analysis of collected groundwater samples will meet all quality assurance criteria set forth by this QAPP and DER-10.

#### *Sample Field Blanks and Duplicates*

Field blanks will be collected for quality assurance purposes at a rate of one per 20 investigative samples per matrix. Field blanks will be obtained by pouring laboratory-demonstrated analyte-free water on or through a decontaminated sampling device following use and implementation of decontamination protocols. The water will be collected off of the sampling device into a laboratory-provided sample container for analysis. Field blank samples will be analyzed for the complete list of analytes on the day of sampling.



Field duplicate groundwater samples will be collected and analyzed for quality assurance purposes. Field duplicate samples will be collected at a frequency of 1 per 20 investigative samples per analysis and will be submitted to the laboratory as “blind” samples. If less than 20 samples are collected during a particular sampling event, one field duplicate sample will be collected.

#### **5.4 SAMPLE CONTAINERS AND HANDLING**

Certified, commercially clean sample containers will be obtained from the analytical laboratory. For groundwater samples, the laboratory will also prepare and supply the required trip blanks and field blank sample containers and reagent preservatives. Sample bottle containers, including the field blank containers, will be placed into plastic coolers by the laboratory. These coolers will be received by the field sampling team within 24 hours of their preparation in the laboratory. Prior to the commencement of field work, Langan field personnel will fill the plastic coolers with ice in Ziploc® bags (or equivalent) to attempt to maintain a temperature of  $4^{\circ} \pm 2^{\circ}$  C.

Groundwater samples collected in the field for laboratory analysis will be placed directly into the laboratory-supplied sample containers. Samples will then be placed and stored on-ice in laboratory provided coolers until shipment to the laboratory.

Possession of samples collected in the field will be traceable from the time of collection until they are analyzed by the analytical laboratory or are properly disposed. Chain-of-custody procedures, described in Section 5.9, will be followed to maintain and document sample possession. Samples will be packaged and shipped as described in Section 5.6.

#### **5.5 SAMPLE PRESERVATION**

Sample preservation measures will be used in an attempt to prevent sample decomposition by contamination, degradation, biological transformation, chemical interactions and other factors during the time between sample collection and analysis. Preservation will commence at the time of sample collection and will continue until analyses are performed. Should chemical preservation be required, the analytical laboratory will add the preservatives to the appropriate sample containers before shipment to the office or field. Samples will be preserved according to the requirements of the specific analytical method selected, as shown in Attachment C.

## **5.6 SAMPLE SHIPMENT**

### **5.6.1 Packaging**

Groundwater sample containers will be placed in plastic coolers. Ice in Ziploc® bags (or equivalent) will be placed around sample containers. Cushioning material will be added around the sample containers if necessary. Chains-of-custody and other paperwork will be placed in a Ziploc® bag (or equivalent) and placed inside the cooler. The cooler will be taped closed and custody seals will be affixed to one side of the cooler at a minimum. If the samples are being shipped by an express delivery company (e.g. FedEx) then laboratory address labels will be placed on top of the cooler.

### **5.6.2 Shipping**

Standard procedures to be followed for shipping environmental samples to the analytical laboratory are outlined below.

- All environmental samples will be transported to the laboratory by a laboratory-provided courier under the chain-of-custody protocols described in Section 5.9.
- Prior notice will be provided to the laboratory regarding when to expect shipped samples. If the number, type or date of shipment changes due to site constraints or program changes, the laboratory will be informed.

## **5.7 DECONTAMINATION PROCEDURES**

Decontamination procedures will be used for non-dedicated sampling equipment. Decontamination of field personnel is discussed in the site-specific Health and Safety Plan (HASP) included in Appendix H of the SMP. Field sampling equipment that is to be reused will be decontaminated in the field in accordance with the following procedures:

1. Laboratory-grade glassware detergent and tap water scrub to remove visual contamination
2. Generous tap water rinse
3. Distilled/de-ionized water rinse

## **5.8 RESIDUALS MANAGEMENT**

Debris (e.g., paper, plastic and disposable personal protective equipment [PPE]) will be collected in plastic garbage bags and disposed of as non-hazardous industrial waste.

Debris is expected to be transported to a local municipal landfill for disposal. Residual fluids (such as purge water) will be collected and stored in DOT-approved (or equivalent) 55-gallon drums in a designated storage area at the site. The residual fluids will be transported to the on-site wastewater treatment plant or analyzed, characterized and disposed off-site in accordance with applicable federal and state regulations. Residual fluids such as decontamination water may be discharged to the ground surface, however, if gross contamination is observed, the residual fluids will be collected, stored, and transported similar purge water or other residual fluids.

## **5.9 CHAIN OF CUSTODY PROCEDURES**

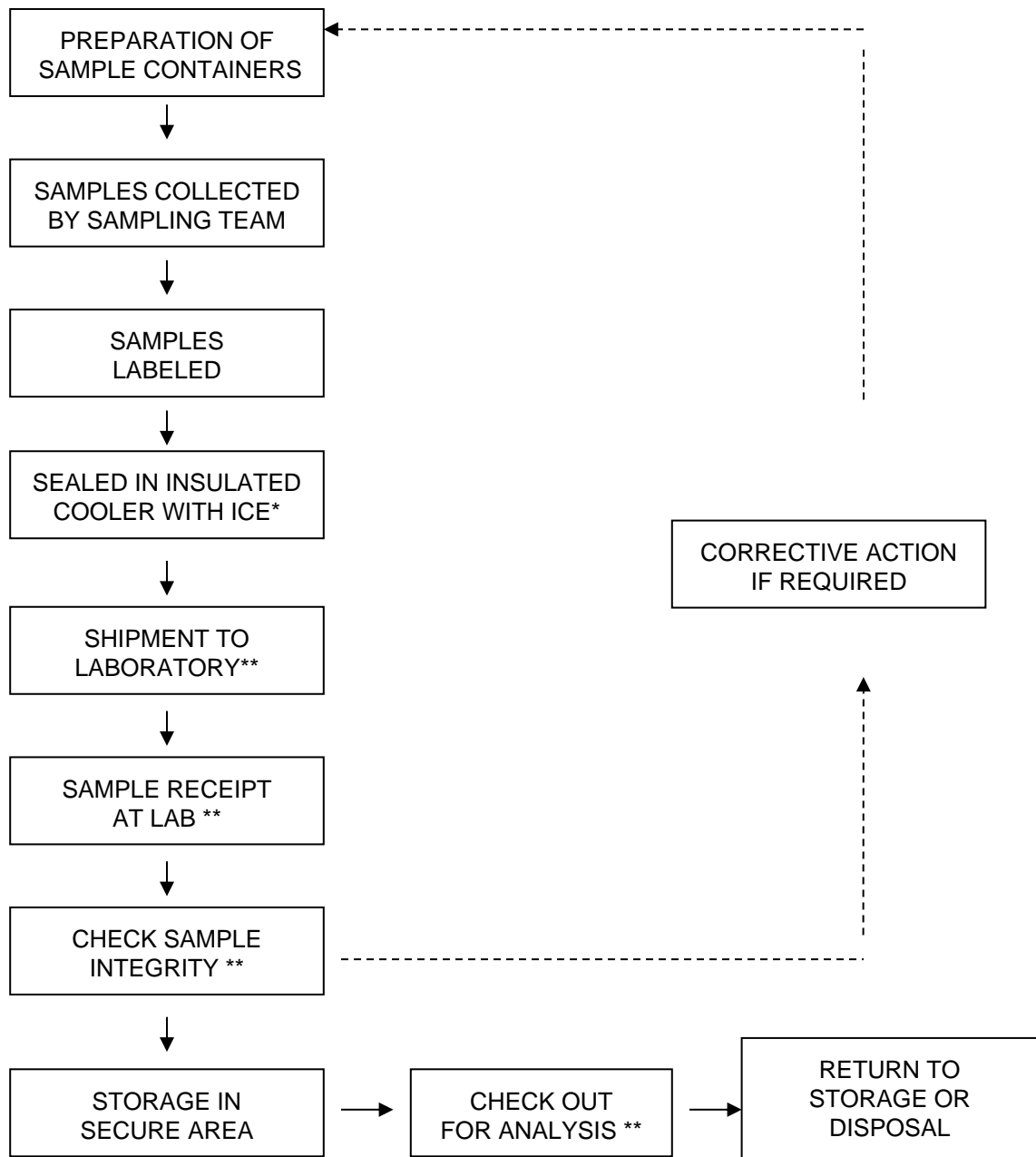
A chain-of-custody protocol has been established for collected samples that will be followed during sample handling activities in both field and laboratory operations. The primary purpose of the chain-of-custody procedures is to document the possession of the samples from collection through shipping, storage and analysis to data reporting and disposal. Chain-of-custody refers to actual possession of the samples. Samples are considered to be in custody if they are within sight of the individual responsible for their security or locked in a secure location. Each person who takes possession of the samples, except the shipping courier, is responsible for sample integrity and safe keeping. Chain-of-custody procedures are provided below:

- Chain-of-custody will be initiated by the laboratory supplying the pre-cleaned and prepared sample containers. Chain-of-custody forms will accompany the sample containers.
- Following sample collection, the chain-of-custody form will be completed for the sample collected. The sample identification number, date and time of sample collection, analysis requested and other pertinent information (e.g., preservatives) will be recorded on the form. All entries will be made in waterproof, permanent blue or black ink.
- Langan field personnel will be responsible for the care and custody of the samples collected until the samples are transferred to another party, dispatched to the laboratory, or disposed. The sampling team leader will be responsible for enforcing chain-of-custody procedures during field work.
- When the form is full or when all samples have been collected that will fit in a single cooler, the sampling team leader will check the form for possible errors and sign the chain-of-custody form. Any necessary corrections will be made to the record with a single strike mark, dated, and initialed.

Sample coolers will be accompanied by the chain-of-custody form, sealed in a Ziploc® bag (or equivalent) and placed on top of the samples or taped to the inside of the cooler lid. If applicable, a shipping bill will be completed for each cooler and the shipping bill number recorded on the chain-of-custody form.

Samples will be packaged for shipment to the laboratory with the appropriate chain-of-custody form. A copy of the form will be retained by the sampling team for the project file and the original will be sent to the laboratory with the samples. Bills of lading will also be retained as part of the documentation for the chain-of-custody records, if applicable. When transferring custody of the samples, the individuals relinquishing and receiving custody of the samples will verify sample numbers and condition and will document the sample acquisition and transfer by signing and dating the chain-of-custody form. This process documents sample custody transfer from the sampler to the analytical laboratory. A flow chart showing a sample custody process is included as Figure 5.1, and a chain-of-custody form is included as Figure 5.2.

Figure 5.1 Sample Custody



\*SUMMA CANISTERS SHOULD NOT BE ICED  
\*\* REQUIRES SIGN-OFF ON CHAIN-OF-CUSTODY FORM

Figure 5.2 Sample Chain-of-Custody Form

<b>NEW YORK CHAIN OF CUSTODY</b> Mansfield, MA 02048 8 Walkup Dr. TEL: 508-898-3220 FAX: 508-898-3193		Service Centers Mahwah, NJ 07480: 36 Whitney Rd., Suite 6 Albany, NY 12256: 14 Walker Way Tonawanda, NY 14150: 276 Cooper Ave., Suite 106		ALPHA Job # Billing Information Same as Client Info PO #	
Project Information Project Name: Project Location: Project # (Use Project name as Project #)		Deliverables <input type="checkbox"/> ASP-A <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> Other		Date Rec'd in Lab Regulatory Requirement <input type="checkbox"/> NY TOGS <input type="checkbox"/> AWQ Standards <input type="checkbox"/> NY CP-61 <input type="checkbox"/> NY Restricted Use <input type="checkbox"/> NY Unrestricted Use <input type="checkbox"/> NYC Sewer Discharge	
Client Information Client: Address: Phone: Fax: Email:		Disposal Site Information Please identify below location of applicable disposal facilities. Disposal Facility: <input type="checkbox"/> NJ <input type="checkbox"/> NY <input type="checkbox"/> Other:		Turn-Around Time Standard Rush (only if pre approved)	
These samples have been previously analyzed by Alpha Other project specific requirements/comments:		ANALYSIS Sample Filtration <input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below) Sample specific comments		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)	
Please specify Metals or TAL.		Sample ID Collection Date Time Sampler's Initials		Container Type Preservative	
Preservative Code: A - None B - HCl C - HNO <sub>3</sub> D - H <sub>2</sub> SO <sub>4</sub> E - NaOH F - MeOH G - NaHSO <sub>4</sub> H - Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> I/E - Zn Ac/NaOH O - Other		Container Code P - Plastic A - Amber Glass V - Val G - Glass B - Bacteria Cup C - Cube O - Other		Westboro: Certification No: MA935 Mansfield: Certification No: MA015	
Relinquished By:		Date/Time		Received By:	
Date/Time		Date/Time		Date/Time	

Laboratory chain-of-custody will be maintained throughout the analytical processes as described in the laboratory's QA Manual. The analytical laboratory will provide a copy of the chain-of-custody in the analytical data deliverable package. The chain-of-custody becomes the permanent record of sample handling and shipment.

## **5.10 LABORATORY SAMPLE STORAGE PROCEDURES**

The analytical laboratory will use a laboratory information management system (LIMS) to track and schedule samples upon receipt by the analytical laboratories. Any sample anomalies identified during sample log-in must be evaluated on individual merit for the impact upon the results and the data quality objectives of the project. When irregularities do exist, the environmental consultant must be notified to discuss recommended courses of action and documentation of the issue must be included in the project file.

For samples requiring thermal preservation, the temperature of each cooler will be immediately recorded. Each sample and container will be assigned a unique laboratory identification number and secured within the custody room walk-in coolers designated for new samples. Samples will be, as soon as practical, disbursed in a manner that is functional for the operational team. The temperature of all coolers and freezers will be monitored and recorded using a certified temperature sensor. Any temperature excursions outside of acceptance criteria (i.e., below 2°C or above 6°C) will initiate an investigation to determine whether any samples may have been affected. Samples for VOCs will be maintained in satellite storage areas within the VOC laboratory. Following analysis, the laboratory's specific procedures for retention and disposal will be followed as specified in the laboratory's SOPs and/or QA manual.

## **6.0 DATA REDUCTION, VALIDATION, AND REPORTING**

### **6.1 INTRODUCTION**

Data collected during the field investigation will be reduced and reviewed by the laboratory QA personnel, and a report on the findings will be tabulated in a standard format. The criteria used to identify and quantify the analytes will be those specified for the applicable methods in the USEPA SW-846 and subsequent updates. The data package provided by the laboratory will contain all items specified in the USEPA SW-846 appropriate for the analyses to be performed, and be reported in standard format.

The completed copies of the chain-of-custody records (both external and internal) accompanying each sample from time of initial bottle preparation to completion of analysis shall be attached to the analytical reports.

### **6.2 DATA REDUCTION**

The Analytical Services Protocol (ASP) Category B data packages and an electronic data deliverable (EDD) will be provided by the laboratory after receipt of a complete sample delivery group. The Project Manager will immediately arrange for archiving the results and preparation of result tables. These tables will form the database for assessment of the site contamination condition.

Each EDD deliverable must be formatted using a Microsoft Windows operating system and the NYSDEC data deliverable format for EQUiS™. To avoid transcription errors, data will be loaded directly into the American Standard Code for Information Interchange (ASCII) format from the LIMS. If this cannot be accomplished, the consultant should be notified via letter of transmittal indicating that manual entry of data is required for a particular method of analysis. All EDDs must also undergo a QC check by the laboratory before delivery. The original data, tabulations, and electronic media are stored in a secure and retrievable fashion.

The Project Manager or Task Manager will maintain close contact with the QA reviewer to ensure all non-conformance issues are acted upon prior to data manipulation and assessment routines. Once the QA review has been completed, the Project Manager may direct the Team Leaders or others to initiate and finalize the analytical data assessment.



### **6.3 DATA VALIDATION**

Data validation will be performed in accordance with the USEPA Region 2 SOPs for data validation and USEPA's National Functional Guidelines for Organic and Inorganic Data Review. Tier 1 data validation (the equivalent of USEPA's Stage 2A validation) will be performed to evaluate data quality. Tier 1 data validation is based on completeness and compliance checks of sample-related QC results including:

- Holding times;
- Sample preservation;
- Blank results (method, trip, and field blanks);
- Surrogate recovery compounds and extracted internal standards (as applicable);
- LCS and LCSD recoveries and RPDs;
- MS and MSD recoveries and RPDs;
- Laboratory duplicate RPDs; and
- Field duplicate RPDs

A DUSR will be prepared by the data validator and reviewed by the QAM before issuance. The DUSR will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

Based on the results of data validation, the validated analytical results reported by the laboratory will be assigned one of the following usability flags:

- "U" - Not detected. The associated number indicates the approximate sample concentration necessary to be detected significantly greater than the level of the highest associated blank;
- "UJ" - Not detected. Quantitation limit may be inaccurate or imprecise;
- "J" - Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method
- "N" - Tentative identification. Analyte is considered present in the sample;
- "R" – Unreliable result; data is rejected or unusable. Analyte may or may not be present in the sample; and

- No Flag - Result accepted without qualification.

#### **6.4 REPORTING**

Upon receipt of validated analytical results, NYSDEC format EDDs, compatible with EQUIS™ will be prepared and submitted to the NYSDEC.

## **7.0 QUALITY ASSURANCE PERFORMANCE AUDITS AND SYSTEM AUDITS**

### **7.1 INTRODUCTION**

Quality assurance audits may be performed by the project quality assurance group under the direction and approval of the QAO. These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s). Functioning as an independent body and reporting directly to corporate quality assurance management, the QAO may plan, schedule, and approve system and performance audits based upon procedures customized to the project requirements. At times, the QAO may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. However, these personnel will not have responsibility for the project work associated with the performance audit.

### **7.2 SYSTEM AUDITS**

System audits may be performed by the QAO or designated auditors, and encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory quality control procedures and associated documentation may be system audited. These audits may be performed once during the performance of the project. However, if conditions adverse to quality are detected or if the Project Manager requests, additional audits may be performed.

### **7.3 PERFORMANCE AUDITS**

The laboratory may be required to conduct an analysis of Performance Evaluation samples or provide proof that Performance Evaluation samples submitted by USEPA or a state agency have been analyzed within the past twelve months.

### **7.4 FORMAL AUDITS**

Formal audits refer to any system or performance audit that is documented and implemented by the QA group. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklists to objectively verify that quality assurance requirements have been developed, documented, and instituted in accordance with contractual and project criteria. Formal audits may be performed on project and subcontractor work at various locations.

Audit reports will be written by auditors who have performed the site audit after gathering and evaluating all data. Items, activities, and documents determined by lead auditors to be in noncompliance shall be identified at exit interviews conducted with the involved management. Non-compliances will be logged, and documented through audit findings, which are attached to and are a part of the integral audit report. These audit-finding forms are directed to management to satisfactorily resolve the noncompliance in a specified and timely manner.

The Project Manager has overall responsibility to ensure that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports must be submitted to the Project Manager within fifteen days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the QAO prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the QAO will close out the audit report and findings.

## **8.0 CORRECTIVE ACTION**

### **8.1 INTRODUCTION**

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected.

### **8.2 PROCEDURE DESCRIPTION**

When a significant condition adverse to quality is noted at site, laboratory, or subcontractor location, the cause of the condition will be determined and corrective action will be taken to preclude repetition. Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO, Project Manager, Field Team Leader and involved contractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action.

All project personnel have the responsibility, as part of the normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality. Corrective actions will be initiated as follows:

- When predetermined acceptance standards are not attained;
- When procedure or data compiled are determined to be deficient;
- When equipment or instrumentation is found to be faulty;
- When samples and analytical test results are not clearly traceable;
- When quality assurance requirements have been violated;
- When designated approvals have been circumvented;
- As a result of system and performance audits;
- As a result of a management assessment;
- As a result of laboratory/field comparison studies; and
- As required by USEPA SW-846, and subsequent updates, or by the NYSDEC ASP.

Project management and staff, such as field investigation teams, remedial response planning personnel, and laboratory groups, monitor on-going work performance in the normal course of daily responsibilities. Work may be audited at the sites, laboratories, or contractor locations. Activities, or documents ascertained to be noncompliant with quality

assurance requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the Task Manager.

Personnel assigned to quality assurance functions will have the responsibility to issue and control Corrective Action Request (CAR) Forms (Figure 8.1 or similar). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered. The CAR is issued to the personnel responsible for the affected item or activity. A copy is also submitted to the Project Manager. The individual to whom the CAR is addressed returns the requested response promptly to the QA personnel, affixing his/her signature and date to the corrective action block, after stating the cause of the conditions and corrective action to be taken. The QA personnel maintain the log for status of CARs, confirms the adequacy of the intended corrective action, and verifies its implementation. CARs will be retained in the project file for the records.

Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The Project Manager will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

**FIGURE 8.1**

<b>CORRECTIVE ACTION REQUEST</b>					
Number: _____		Date: _____			
TO: _____ You are hereby requested to take corrective actions indicated below and as otherwise determined by you to (a) resolve the noted condition and (b) to prevent it from recurring. Your written response is to be returned to the project quality assurance manager by _____					
CONDITION:					
REFERENCE DOCUMENTS:					
RECOMMENDED CORRECTIVE ACTIONS:					
_____	_____	_____	_____	_____	_____
Originator	Date	Approval	Date	Approval	Date
RESPONSE					
CAUSE OF CONDITION					
CORRECTIVE ACTION					
(A) RESOLUTION					
(B) PREVENTION					
(C) AFFECTED DOCUMENTS					
C.A. FOLLOWUP:					
CORRECTIVE ACTION VERIFIED BY: _____ DATE: _____					

## **9.0 REFERENCES**

- NYSDEC. Division of Environmental Remediation. DER-10/Technical Guidance for Site Investigation and Remediation, dated May 3, 2010.
- NYSDEC. Technical and Administrative Guidance Memorandum (TAGM) Solid Waste Guidance (SW-96-09) Development and Review of Site Analytical Plans, dated May 3, 2001.
- Taylor, J. K., 1987. Quality Assurance of Chemical Measurements. Lewis Publishers, Inc., Chelsea, Michigan
- USEPA, 2014. "Test Method for Evaluating Solid Waste," Update V dated July 2014 U.S. Environmental Protection Agency, Washington, D.C.
- USEPA, 2016. Region II Standard Operating Procedure (SOP) #HW-34, "Trace Volatile Data Validation" (July 2015, Revision 0), USEPA Hazardous Waste Support Section. USEPA Region II
- USEPA 2014. Hazardous Waste Support Section. Analysis of Volatile Organic Compounds in Air Contained in Canisters by Method TO-15. SOP No. HW-31, Revision 6, dated June 2014.
- USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review, Office of Superfund Remediation and Technology Innovation, EPA-540-R-2017-002, January 2017.



**APPENDIX I**  
**FIELD SAMPLING PLAN**

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# FIELD SAMPLING PLAN

for

**27-01 JACKSON AVENUE  
Block 432, Lot 21  
Long Island City, New York  
NYSDEC BCP Site No. C241209**

*Prepared For:*

**2701 JACKSON LLC  
425 Northern Boulevard  
Great Neck, NY 11021**

*Prepared By:*

**Langan Engineering, Environmental, Surveying  
Landscape Architecture and Geology, D.P.C.  
21 Penn Plaza  
360 West 31st Street, 8th Floor  
New York, New York 10001**

**August 2022  
Langan Project No. 170472002**

***LANGAN***

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## **1.0 INTRODUCTION**

27-01 Jackson Avenue LLC (the “Participant”) executed an Order on Consent (Index No. S241209-08-09) with the New York State Department of Environmental Conservation (NYSDEC) on DATE. The intent of the CO is to monitor off-site groundwater conditions following off-site groundwater treatment and on-site dewatering affiliated with the an approximately 9,200-square-foot (0.21 acre) property located at 27-01 Jackson Avenue (Borough of Queens Tax Block 432, Lot 21) in the Long Island City neighborhood of Queens, New York. The property is enrolled in the New York State Brownfield Cleanup Program (BCP) as Site No. C241209. The off-site, south- and west-adjointing sidewalks of the BCP site will be hereinafter referred to as the “CO site.”

The BCP site is bound by a multi-story commercial use building followed by Hunter Street to the north; a vacant lot and the Ed Koch Queensboro Bridge on-ramp and upper roadway followed by a multi-story commercial use building to the east; Jackson Avenue followed by a one-story industrial use building to the south; and 43rd Avenue followed by multi-story mixed-use buildings to the west.

Prior to redevelopment, the BCP site was a vacant lot used to stage construction materials and equipment. Between 1898 and 1950, the site was developed with multiple two- and three-story buildings. In 1936, the western-most building was operated as a hand laundry facility, and in 1947, the central part of the site operated as a carpenter shop. By 1970, the buildings had been replaced with a gas station and auto repair shop.

Petroleum-impacted soil and groundwater were identified beneath the BCP site and the southern- and western-adjointing sidewalks along Jackson Avenue and 43rd Avenue during subsurface investigations performed by Langan in April and June 2013. The impacts are related to open New York State Department of Environmental Conservation (NYSDEC) spill No. 9913082, which was reported in 2000 during the removal of ten 550-gallon gasoline underground storage tanks (USTs), closed in 2005, and re-opened in April 2013 following the aforementioned subsurface investigation. The BCP site is listed in the U.S. Historical Auto Stations database for former operations as a gas station and auto repair shop, and in the NYSDEC Petroleum Bulk Storage (PBS) database as currently housing three 4,000-gallon gasoline USTs and one 4,000-gallon diesel UST (PBS Site No. 2-090565). A representative of American Lions, the current owner of the property, confirmed that the 4,000-gallon USTs were removed in 2015.

This Field Sampling Plan (FSP) defines the methods and procedures for conducting sampling during site management and related work for the southern- and western-adjointing sidewalks along Jackson Avenue and 43rd Avenue (hereafter referred to as “the CO site”) associated with the BCP site.

### **1.1 OVERVIEW OF FIELD SAMPLING ACTIVITIES**

The field sampling program will include the following:

- Groundwater samples will be collected quarterly from each of the four pre-existing monitoring wells along Jackson Avenue and 43rd Avenue.

## **2.0 GENERAL FIELD GUIDELINES**

### **2.1 SITE HAZARDS AND UNDERGROUND UTILITIES**

Potential on-site surface hazards, such as sharp objects, overhead power lines, energized areas, and other building hazards, will be identified prior to initiation of fieldwork. Additionally, prior to the onset of future ground intrusive work proposed by the Participant, the New York City One-Call Center will be contacted for a Code 753 utility mark-out, if necessary.

### **2.2 FIELD LOGBOOKS**

All field activities will be documented in field logbooks. Entries will be of sufficient detail and will include a complete daily record of significant events, observations, and measurements. The field logbook will provide a legal record of the activities conducted at the site. Please refer to Langan's Standard Operating Procedure (SOP) No. 2 for detailed information regarding field books. Accordingly:

- Field books will be assigned a unique identification number, and bound with consecutively numbered pages.
- Field books will be controlled by the Field Team Leader while fieldwork is in progress.
- Entries will be written with waterproof ink, and signed and dated at the conclusion of each day of fieldwork.
- Erroneous entries made while fieldwork is in progress will be corrected by the person that made the entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing the correction.
- Corrections made after departing the field will be made by the person who made the original entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing and dating the time of the correction.

At a minimum, daily field book entries will include the following information:

- Location of field activity
- Date and time of entry
- Names and titles of field team members

- Names and titles of any site visitors and site contacts
- Weather information (i.e., temperature, cloud coverage, wind speed and direction)
- Purpose of field activity
- A detailed description of the field work conducted
- Sample media (i.e., groundwater)
- Sample collection method
- Number and volume of samples taken
- Description of sampling locations
- Volume of groundwater removed before sampling
- Preservatives used
- Analytical parameters
- Date and time of collection
- Sample identification numbers
- Sample distribution (e.g., laboratory)
- Field observations
- Any field measurements collected (e.g., pH, temperature, conductivity, water level)
- References to all maps and photographs of the sampling sites
- Information pertaining to sample documentation such as:
  - Dates and method of sample shipments
  - Chain-of-Custody record and if shipped, tracking numbers

### **3.0 FIELD EQUIPMENT DECONTAMINATION AND MANAGEMENT OF INVESTIGATION DERIVED WASTES**

#### **3.1 DECONTAMINATION AREA**

As necessary, a temporary decontamination area lined with polyethylene sheeting will be constructed for cleaning and decontamination of sampling equipment. The location of the decontamination area will be coordinated with the Construction Manager, as necessary. At a minimum, the decontamination pad will be constructed atop a minimum 20 mil low-permeability liner, will be bermed and sloped to a collection sump to contain and collect fluids, and will have side walls to mitigate, to the extent practicable, errant overspray, especially when decontaminating large equipment. Wash waters will be collected and properly disposed of as described below in Section 3.3. Please refer to Langan’s SOP No. 16 for detailed information regarding decontamination.

#### **3.2 EQUIPMENT DECONTAMINATION**

The following procedures will be used to decontaminate equipment used during remediation and/or development-related work.

- Any non-disposable sampling apparatus (i.e., submersible pump, water level detection meter) will be decontaminated between each sample collected.
- A three-stage system will be used to decontaminate the equipment using buckets. The first bucket will contain an Alconox-water mixture and scrub brush, the second bucket will contain clean water for rinsing, and the third bucket will contain clean water for final rinsing.
- Decontamination water will be replaced when the third bucket of water becomes cloudy.

#### **3.3 MANAGEMENT OF DERIVED WASTES**

- Decontamination wash waters and purged groundwater will be collected into UN/DOT-approved 55-gallon drums pending waste characterization and off-site transport and disposal. The drums will be labeled as remediation-derived wastewater and temporarily stored in a secured area on-site pending disposal at a facility permitted to accept such waste.
- All personal protective equipment (PPE) and disposable sampling equipment will be disposed of as solid municipal waste, unless impacted by petroleum contamination, at

which point, PPE will be placed in 55-gallon drums or roll-off containers for disposal in accordance with applicable local, state, and federal regulations.

## **4.0 SAMPLING PROCEDURES**

### **4.1 GROUNDWATER SAMPLING**

The following sampling equipment and methods will be used for groundwater sampling.

- Field book
- Project plans
- PPE in accordance with the HASP
- Oil/water interface probe
- Submersible pump, battery, and voltage controller
- Groundwater parameter meter
- Dedicated polyethylene tubing
- Twine
- PID
- Camera
- Towels or rags
- Laboratory-supplied sample bottles and coolers
- Ice
- Shipping supplies (as necessary)

Please refer to Langan's SOP No. 3 for detailed information on placing sampling equipment orders and SOP No. 12 for detailed information regarding groundwater sampling equipment and collection.



## Sample Collection

Set the pump in the groundwater monitoring well to straddle the middle of the screened interval that is to be sampled. Groundwater samples will be collected via a low-flow methodology, with a flow rate of less than 0.5 liters per minute.

Using low-flow sampling methods, prior to sample collection, each well will be purged and the groundwater quality parameters will be recorded every 5 minutes. The sample will be collected after all of the following groundwater parameters have reached stabilization, which is defined when all parameter values are within the acceptable range shown below for three consecutive readings:

- pH  $\pm 0.1$  unit
- Specific Conductance  $\pm 3\%$
- Temperature  $\pm 3\%$
- Dissolved Oxygen  $\pm 10\%$  for values greater than 0.5 mg/L
- Turbidity  $\pm 10\%$  for values greater than 5 NTU
- ORP/Eh  $\pm 10$  millivolts

Samples will be collected directly from the pump discharge tubing.

Samples collected for VOC analysis will be collected into three 40-milliliter (mL) vials with a septum in the lid. The vials will be completely filled as to eliminate any headspace or bubbles. The remaining sample volume will be placed into laboratory-supplied containers for laboratory analysis of remaining compounds.

The sample containers will be labeled, placed in a laboratory-supplied cooler, and packed on ice (to maintain a temperature of 4°C). The coolers will be transported via laboratory courier under standard chain-of-custody protocol to the laboratory for analysis.

The sample locations, descriptions, and depths will be recorded in the field book. Chain-of-custody procedures will be followed as outlined in the QAPP appended to the SMP.

The sampling equipment and purged groundwater will be disposed of as described above in Section 3.3.

## 5.0 FIELD SAMPLE IDENTIFICATION AND CUSTODY

### 5.1 SAMPLE LOCATION NUMBERING SYSTEM

- Groundwater samples will be designated with the sample location and collection date.

### 5.2 SAMPLE IDENTIFICATION

Each sample will be given a unique alphanumeric identifier similar to the classification system guidance shown below. Please refer to Langan’s SOP No. 1 for detailed information regarding sampling nomenclature.

#### SAMPLE IDENTIFICATION

---

LL-*	NN-**	LL
Sample Type	Sample Number	QC Identifier

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Sample Type: Monitoring Well – MW; Water – W

Sample Number: Number referenced to a sample location map.

Depth Code: Depth in feet of sample interval (e.g., 0-2 = Sample depth of 0-2 feet bgs).

QC Identifier: DUP = Field Duplicate (blind sample, do not indicate sample location)

Trip Blank: Designated by TB and the date (e.g., TB-062504)

\* L = Letter

\*\* N = Number

Field duplicate samples will be assigned identifiers that do not allow the laboratory to distinguish them as field duplicates. Each sample container will be labeled prior to packing for shipment. The sample identifier, site name, date, and time of sampling, and analytical parameters will be written on the label in waterproof ink and recorded in the field book.

### 5.3 ANALYTICAL METHODS

Analytical methods for groundwater include Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 375 list VOCs via United States Environmental Protection Agency (USEPA) Method 8260. All analyses would be completed by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

### 5.4 CHAIN OF CUSTODY

Please refer to Langan’s SOP No. 4 for detailed information on laboratory chain-of-custody preparation and documentation. In general, the following procedures should be implemented:

- A chain-of-custody record (Figure 5.5 or similar) will accompany the sample containers during selection and preparation at the laboratory, during shipment to the field, and during return shipment to the laboratory.
- The chain-of-custody will identify each sample container and the analytical parameters for each, and will list the field personnel that collected the samples, the project name and number, the name of the analytical laboratory that will receive the samples, and the method of sample shipment.
- If samples are split and sent to different laboratories, a copy of the chain-of-custody record will be sent with each sample shipment.
- The chain-of-custody will be completed by field personnel as samples are collected and packed for shipment.
- Erroneous markings will be crossed-out with a single line and initialed by the author.
- The COMMENTS space will be used to indicate if the sample is a matrix spike, matrix spike duplicate, or matrix duplicate.
- Trip and field blanks will be listed on separate rows.
- After the samples have been collected and sample information has been listed on the chain-of-custody form, the method of shipment, the shipping cooler identification number(s), and the shipper airbill number will be entered on the chain-of-custody.
- A second member of the field team will review the chain-of-custody for completeness and accuracy whenever possible.
- Finally, a member of the sampling team will write his/her signature, the date, and time on the first RELINQUISHED BY space. Duplicate copies of each chain-of-custody must be completed.
- One copy of the chain-of-custody will be retained by sampling personnel. Blind duplicate samples will be identified on the copy retained by the sampling personnel. The other copy and the original will be sealed in a plastic bag and taped inside the lid of the shipping cooler without additional identification of blind duplicate samples.
- Sample shipments will be refrigerated at 4°C, typically by packing with ice, to preserve the samples during shipment.
- After the shipping cooler is closed, custody seals provided by the laboratory will be affixed to the latch and across the front and back of the cooler lid, and signed by the person relinquishing the samples to the shipper or courier.


- The seal will be covered with clear tape, and the cooler lid will be secured by wrapping with packing tape, if shipped.
- The cooler will be relinquished to the courier or shipper.
- The chain-of-custody seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the samples will not be analyzed.
- The samples must be delivered to the laboratory within 48 hours of collection.

## **5.5 SAMPLE DOCUMENTATION**

The field team leader will retain a copy of the chain-of-custody and will ensure that the following information is recorded in the field book for each sample:

- Sample identifier
- Identification of sampled media (e.g., groundwater)
- Sample location
- Field measurements, (e.g., pH, temperature, conductivity, water levels)
- Date and time of collection
- Sample collection method
- Volume of groundwater purged before sampling
- Number of sample containers
- Analytical parameters
- Preservatives used
- Shipping information
- Dates and method of sample shipments
- Chain-of-custody record numbers
- Tracking numbers, if shipped
- Sample recipient (e.g., laboratory name)

Figure 5.5 Chain-of-Custody Form

 <b>NEW YORK</b> <b>CHAIN OF CUSTODY</b>		<b>Service Centers</b> Mahwah, NJ 07430: 316 Whitney Rd, Suite 5 Albany, NY 12235: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105		Page _____ of _____	
<b>Client Information</b> Client: _____ Address: _____ Phone: _____ Fax: _____ Email: _____		<b>Project Information</b> Project Name: _____ Project Location: _____ Project # _____ Project Manager: _____ Turn-Around Time: _____ Standard <input type="checkbox"/> Rush (only if pre approved) <input type="checkbox"/>		<b>Deliverables</b> <input type="checkbox"/> ASP-A <input type="checkbox"/> ASP-B <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File) <input type="checkbox"/> Other _____	
These samples have been previously analyzed by Alpha <input type="checkbox"/>		<b>Regulatory Requirement</b> <input type="checkbox"/> NY TOGS <input type="checkbox"/> NY Part 375 <input type="checkbox"/> AWO Standards <input type="checkbox"/> NY CP-51 <input type="checkbox"/> NY Restricted Use <input type="checkbox"/> Other _____ <input type="checkbox"/> NY Unrestricted Use <input type="checkbox"/> <input type="checkbox"/> NYC Sewer Discharge		<b>Disposal Site Information</b> Please identify below location of applicable disposal facilities. Disposal Facility: _____ <input type="checkbox"/> NJ <input type="checkbox"/> NY <input type="checkbox"/> Other: _____	
Please specify Metals or TAL. _____		<b>ANALYSIS</b>		<b>Sample Filtration</b> <input type="checkbox"/> Done <input type="checkbox"/> Lab to do <input type="checkbox"/> Preservation <input type="checkbox"/> Lab to do (Please Specify below) _____ _____	
<b>ALPHA Lab ID (Lab Use Only)</b>		<b>Sample ID</b>		<b>Sample Specific Comments</b>	
Preservative Code: _____ Container Code: _____ Westboro: Certification No: MA936 Mansfield: Certification No: MA015		Collection Date: _____ Time: _____ Sample Matrix: _____ Sampler's Initials: _____		Container Type: _____ Preservative: _____	
Relinquished By: _____ Date/Time: _____		Received By: _____ Date/Time: _____		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHAS TERMS & CONDITIONS. (See reverse side.)	