REMEDIAL INVESTIGATION WORK PLAN

for

203-207 VAN SICLEN AVENUE
Brooklyn, New York
NYSDEC BCP Site No. C224285

Prepared For:

Van Siclen Realty LLC
60 Lyman Place
Staten Island, New York 10304

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

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Langan Project No. 170513001

TABLE OF CONTENTS

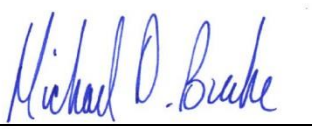
FIGURES

TABLE

APPENDICES

CERTIFICATION

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



Michael D. Burke, PG, CHMM

1.0 INTRODUCTION

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) prepared this Remedial Investigation Work Plan (RIWP) on behalf of Van Siclen Realty LLC (the Volunteer) for the property located at 203-207 Van Siclen Avenue in the East New York neighborhood of Brooklyn, New York (the site). The site is enrolled in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as Site No. C224285, pursuant to a March 6, 2019 Brownfield Cleanup Agreement (BCA). As a result of the City Environmental Quality Review (CEQR) process, the site was assigned an E-Designation (E-366) for Hazardous Materials and Noise on April 20, 2016 by the New York City Department of City Planning (NYCDCP) as part of the East New York rezoning (CEQR No. 15DCP102K).

This RIWP details the proposed Remedial Investigation (RI) designed to develop a contaminated parcel of land into a viable residential and/or community space/school, while implementing remedial measures that are protective of human health and the environment. The RI will be conducted in accordance with Title 6 of the New York Code, Rules and Regulations (6 NYCRR) Part 375-3.8, NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10), and New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The objectives and goals of the RI are listed below.

- Define the nature and extent of contamination in all media at the site
- Evaluate the potential for contamination in all media to emanate from the site
- Generate sufficient data to evaluate remedial action alternatives
- Generate sufficient data to evaluate actual and potential threats to human health and the environment

2.0 SITE BACKGROUND

2.1 Site Description

The site is located at 203-207 Van Siclen Avenue and comprises Block 3978, Lots 14 and 15, in the East New York neighborhood of Brooklyn New York. The approximately 10,000-square-foot site is bound to the north by Liberty Avenue followed by residences; to the east by residences and an auto body shop followed by Hendrix Avenue; to the south by a vacant lot and residences followed by Glenmore Avenue; and to the west by Van Siclen Avenue followed by mixed-use commercial/residential buildings. Long Island Rail Road (LIRR) tracks run east-west below Atlantic Avenue, about 425 feet north of the site. The site is currently used for storage of construction equipment. Soil/historic fill material covers most of the site with isolated patches of low vegetation and gravel. A site location map is provided as Figure 1, and a site plan is provided as Figure 2.

The site is located within a Special Mixed Use Paired Manufacturing and Residential District (M1-4/R6A), according to the on-line New York City's Zoning and Land Use Map (17c). This paired district promotes development and expansion of the longstanding mix of residential, commercial, industrial, and cultural use throughout the area. M1 districts typically include light industrial uses, such as woodworking shops, repair shops, and wholesale service and storage facilities, and R6A districts promote residential development with high lot coverage. Zoning is consistent with the contemplated developments.

2.2 Surrounding Property Land Use

The site is located in an urban setting that is characterized by commercial, residential, and industrial uses. The following is a summary of adjoining and surrounding property usage:

DIRECTION	ADJOINING PROPERTIES	SURROUNDING PROPERTIES
North	511 Liberty Avenue (vacant land) 515 Liberty Avenue (two-story residential building) 517 Liberty Avenue (two-story residential building) 523 Liberty Avenue (two-story commercial building with a parking lot)	Various one-story / multiple-story commercial/residential buildings
East	524 Liberty Avenue (three-story residential buildings)	An auto repair shop and various one-story commercial properties and residential buildings
South	211 Van Siclen Avenue (vacant land)	Various commercial and residential buildings

DIRECTION	ADJOINING PROPERTIES	SURROUNDING PROPERTIES
West	510 Liberty Avenue (vacant land – storage for construction equipment)	Various residential and commercial buildings

Land use within a half mile of the site is densely urbanized. Surrounding land use within a half-mile radius includes numerous residential neighborhoods, park land, school facilities, religious centers, and industrial and manufacturing facilities. The nearest ecological receptor is Jamaica Bay, located about 1.5 miles to the south of the site. The nearest sensitive receptor is Breakthrough Christian Day Care Center, located about 600 feet southwest of the site. Sensitive receptors within a half mile of the site include the following:

NAME	ADDRESS	RELATIVE LOCATION TO SITE
Breakthrough Christian Day Care Center	306 Miller Avenue	About 600 feet southwest
Saint Malachy Child Development Center	220 Hendrix Street	About 650 feet north
Innocent Hearts Group Family Daycare	140 Van Siclen Avenue	About 680 feet north
Baybee Lounge Daycare	175 Miller Avenue	About 800 feet northwest
Salve Regina Catholic Academy	237 Jerome Street	About 900 feet east
Royal Daycare Center	2188 Pitkin Avenue	About 1,000 feet southwest
Dance Atlantic Inc.	2796 Fulton Street	About 1,050 feet north
P.S. 290 Juan Morel Campos	135 Schenck Avenue	About 1,150 feet northeast
J.H.S. 292 Margaret S. Douglas	301 Vermont Street	About 1,350 feet southwest
P.S. 089 Cypress Hills	265 Warwick Street	About 1,430 feet northeast
W.H. Maxwell Career and Technical Education High School	145 Pennsylvania Avenue	About 1,500 feet southwest
Belmont Academy School	619 Belmont Ave	About 1,600 feet southeast
P.S. 158 Warwick	400 Ashford Street	About 1,750 feet southeast
Achievement First Apollo Elementary School and Liberty Middle School	350 Linwood Street	About 1,980 feet northeast
P.S. 149 Danny Kaye	700 Sutter Avenue	About 2,000 feet southwest
Joyful Tots Daycare	403 New Jersey Avenue	About 2,200 feet southwest
Brooklyn Youth Link, Police Athletic League	2588 Atlantic Avenue	About 2,250 feet west
Little Birds Day Care Center, LLC	490 Linwood Street	About 2,300 feet southeast

Major infrastructure systems (i.e., a commuter train tunnel, storm drains, sewers, and underground utility lines) exist within the streets surrounding the site.

2.3 Site Physical Conditions

2.3.1 Topography

Based on the United State Geological Survey (USGS) Brooklyn Quadrangle N.Y. 7.5-minute Series Topographic Map, the site is about 43-feet above mean sea level (msl) as defined by National Geodetic Vertical Datum (NGVD). The surrounding regional topography generally slopes south towards Jamaica Bay.

2.3.2 Geology

Based on findings from a February 2018 Limited Subsurface Investigation by Langan, the site is underlain by historic fill material predominantly consisting of brown sand with varying amounts gravel, silt, concrete, brick, coal, steel fragments, glass, and other debris. The fill layer extended to depths between 5 and 16 feet below grade surface (bgs) in each of the 10 borings. Native deposits encountered beneath the historical fill material predominantly consists of fine- to coarse-grained sand with varying amounts silt and fine gravel. Bedrock was not encountered during the Limited Subsurface Investigation.

Predominant geological surface features (e.g., rock outcroppings) were not observed at the site. Based on the USGS "Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey", the bedrock formation underlying the site is part of the Hartland Formation and consists of interbedded units of fine-grained quartz-feldspar granulite, fine- to coarse-grained muscovite-biotite-garnet schist, and quartz-biotite-hornblende amphibolite. Based on the same map, bedrock is estimated at about 350 feet bgs.

2.3.3 Hydrogeology

Groundwater flow is typically topographically influenced, as shallow groundwater tends to originate in areas of topographic highs and flows toward areas of topographic lows, such as rivers, stream valleys, ponds, and wetlands. A broader, interconnected hydrogeological network often governs groundwater flow at depth or in the bedrock aquifer. Groundwater depth and flow direction are also subject to hydrogeologic and anthropogenic variables such as precipitation, evaporation, extent of vegetation cover, and coverage by impervious surfaces. Other factors influencing groundwater include depth to bedrock, the presence of artificial fill, and variability in local geology and groundwater sources or sinks.

During Langan's Limited Subsurface Investigation, groundwater was encountered at about 38 feet bgs near the center of the site. Inferred groundwater flow is to the south towards Jamaica Bay, which is located approximately 1.5 miles south of the site.

Groundwater in New York City is not used as a potable water source. Potable water provided to the City of New York is derived from reservoirs in the Croton, Catskill, and Delaware watersheds.

2.3.4 Wetlands

Wetlands were evaluated by reviewing the National Wetlands Inventory and NYSDEC regulated wetlands map. Wetlands were not identified on the site or adjoining properties.

2.4 Site Environmental History

The site is located within the East New York section of Brooklyn that is zoned for Special Mixed Use Paired District (M1-4/R6A). Based on information from the current owner, the site was used for storage and maintenance of automobiles prior to May 2018, when the volunteer purchased the site.

Sanborn® Fire Insurance Maps from 1887 to 2007 were reviewed. As early as 1887, the site was divided into four adjoining tax lots and occupied by one 2-story dwelling with a basement. By 1908, the site was vacant and unimproved. From at least 1928 to 1966, the site was occupied by a 4-story residential building with a store. By 1977, Lot 14 was vacant and unimproved, and the entire site was vacant and unimproved by 1981.

NYSDEC Spill No. 9601652 was reported at 522 Liberty Avenue (an alternate address for the site) on May 1, 1996 when the New York Police Department (NYPD) executed a search warrant for an illegal chop shop and discovered the site contaminated with various chemicals, oils, and other unknown materials. Spill case notes indicated that unknown amounts of unknown material, unknown hazardous material, and unknown petroleum were spilled across the surface of the site. The spill was closed on May 2, 1996; but no available information pertinent to the remediation was available.

Historical Sanborn fire insurance maps did not indicate the presence of underground storage tanks (USTs) within the site. Indications of aboveground storage tanks (ASTs) or USTs were not observed during the February 2018 Limited Subsurface Investigation.

2.5 Previous Environmental Reports

Langan conducted a Limited Subsurface Investigation on February 15, 2018 to investigate potential subsurface impacts associated with the site's historical site use as an auto scrap yard, illegal chop shop and Spill No. 9601652. A copy of the BCP Application is included in Appendix A. The investigation included the following:

- A geophysical survey to locate potential USTs and other subsurface structures;
- Advancement of 10 soil borings to depths up to 40 feet bgs, and collection of 14 soil samples.

- Installation of one temporary groundwater monitoring well to about 40 feet bgs, and collection of one groundwater sample.
- Installation of two soil vapor points to about 10 feet bgs, and the collection of two soil vapor samples.

The following sections detail the findings of the geophysical survey and analytical results of soil, groundwater, and soil vapor data collected by Langan during this Limited Subsurface Investigation.

Geophysical Survey

The geophysical survey did not identify anomalies consistent with USTs. Sub-surface utilities were noted and boring locations were adjusted accordingly to avoid them.

Soil

Historic fill material was observed within each soil boring to depths ranging from 5 to 16 feet bgs. The fill primarily consisted of brown, fine- to coarse-grained sand with varying amounts gravel, silt, concrete, brick, coal, steel fragments, and glass and other debris. Native deposits encountered beneath the historically fill predominantly consisted of fine- to coarse-grained sand with varying amounts silt and fine gravel. Bedrock was not encountered. The following constituents were detected in soil samples at concentrations that exceed the NYSDEC Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use (UU) and/or Restricted Use – Restricted Residential (RRU) Soil Cleanup Objectives (SCOs).

- Volatile Organic Compounds (VOCs) were detected above the NYSDEC Part 375 UU SCOs in 1 of the 14 soil samples, but RRU SCOs were not exceeded. The UU SCOs are indicated in parentheses.
    - Ethylbenzene – 1.40 milligrams per kilogram (mg/kg) in SB01_0-2 (1 mg/kg)
    - Total Xylenes – 8.90 mg/kg in SB01_0-2 (0.26 mg/kg)

- Semivolatile Organic Compounds (SVOCs) were detected above NYSDEC Part 375 UU and/or RRU SCOs in 11 of the 14 soil samples. The SCOs are indicated in parentheses.
    - Benzo(a)anthracene – from 1.11 mg/kg in SB02_7-8 to 14.3 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)
    - Benzo(a)pyrene – from 1.06 mg/kg in SB02_7-8 to 12.10 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)
    - Benzo(b)fluoranthene – from 1.69 mg/kg in SB03_0-2 to 13.9 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)

  - Benzo(k)fluoranthene – from 1.42 mg/kg in SB03_0-2 to 8.99 mg/kg in SB02_0-1 (UU SCO of 0.8 mg/kg and RRU SCO of 3.9 mg/kg)
  - Chrysene – from 1.02 mg/kg in SB02_7-8 to 14.80 mg/kg in SB02_0-1 (UU SCO of 1 mg/kg and RRU SCO of 3.9 mg/kg)
  - Dibenzo(a,h)anthracene – from 0.47 mg/kg in SB03_0-2 to 4.24 mg/kg in SB02_0-1 (UU and RRU SCO of 0.330 mg/kg)
  - Indeno(1,2,3-cd)pyrene – from 0.65 mg/kg in SB06_0-1 to 4.92 mg/kg in SB02_0-1 (UU and RRU SCO of 0.5 mg/kg)

- Pesticides were detected above NYSDEC Part 375 UU SCO in 9 of the 14 soil samples, but RRU SCOs were not exceeded. The UU SCOs are indicated in parentheses.
  - 4,4'-DDD – from 0.0037 mg/kg in SB09_1-2 to 0.0092 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - 4,4'-DDE – from 0.0035 mg/kg in SB05_0-2 and SB09_1-2 to 0.0157 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - 4,4'-DDT – from 0.0035 mg/kg in SB08_0-2 to 0.0483 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - Dieldrin – from 0.0055 mg/kg in SB02_7-8 to 0.0115 mg/kg in SB02_0-1 (0.005 mg/kg)

- Metals were detected above NYSDEC Part 375 UU and/or RRU SCOs in 13 of the 14 soil samples. The SCOs are indicated in parentheses.
  - Barium – from 489 mg/kg in SB04_0-2 to 9,060 mg/kg in SB07_0-2 (UU SCO of 350 mg/kg and RRU SCO of 400 mg/kg)
  - Cadmium – from 2.94 mg/kg in SB05_0-2 to 7.36 mg/kg in SB10_0-2 (UU SCO of 2.5 mg/kg and RRU SCO of 4.3 mg/kg)
  - Chromium (Hexavalent) – from 3.66 mg/kg in SB03_0-2 to 4.19 mg/kg in SB09_1-2 (UU SCO of 1 mg/kg)
  - Chromium (Trivalent) – 30.5 mg/kg in SB06_0-1 (UU SCO of 30 mg/kg)
  - Copper – from 59.6 mg/kg in SB04_0-2 to 454 mg/kg in SB05_0-2 (UU SCO of 50 mg/kg and RRU SCO of 270 mg/kg)
  - Lead – from 66.2 mg/kg in SB01_0-2 to 8,530 mg/kg in SB07_0-2 (UU SCO of 63 mg/kg and RRU SCO of 400 mg/kg)
  - Mercury – from 0.18 mg/kg in SB03_5.5-6 to 7.43 mg/kg in SB03_0-2 (UU SCO of 0.18 mg/kg and RRU SCO of 0.81 mg/kg)
  - Nickel – 30.9 mg/kg in SB06_0-1 (UU SCO of 30 mg/kg)
  - Zinc – from 120 mg/kg in SB01_0-2 to 10,900 mg/kg in SB02_0-1 (UU SCO of 109 mg/kg and RRU SCO of 10,000 mg/kg)

- Polychlorinated Biphenyls (PCBs) were detected above NYSDEC Part 375 UU in one of the 14 soil samples. The SCOs are indicated in parentheses.
    - Total PCBs (Aroclor 1248 and 1260) – 0.259 mg/kg in SB10_0-2 (UU SCO of 0.1 mg/kg)

Soil sample locations and summary of analytical results are shown on Figure 3.

Groundwater

Groundwater was encountered at about 38 feet bgs in the temporary monitoring well TMW01, which was located in the central portion of the site. Based on the surface topography of the site and surrounding area, the assumed regional groundwater flow direction is to the south towards Jamaica Bay. Because of poor recharge and limited sample volume, analysis was limited to VOCs, pesticides, and PCBs. The VOC chloroform was reported at a concentration of 12.9 micrograms per liter (µg/L), which exceeds the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS) of µg/L. Groundwater sample location and summary of analytical results are shown on Figure 4.

Soil Vapor

Soil vapor analytical results were compared to NYSDOH Soil Vapor/Indoor Air Matrices A, B, and C (revised in May 2017) of the Guidance for Evaluating Soil Vapor Intrusion. NYSDOH provides decision matrices for eight chlorinated VOCs (carbon tetrachloride, 1,1-dichloroethene, cis-1,2-dichloroethene, tricholoethene, methylene chloride, tetrachloroethene, 1,1,1-trichloroethane, and vinyl chloride). The decision matrices recommend a range of response actions based on the soil vapor and indoor air concentrations. In the absence of indoor air samples, soil vapor results were compared to the lowest concentrations in soil vapor that trigger a mitigation recommendation. Several VOCs were detected in soil vapor, but concentrations did not exceed the minimum NYSDOH Decision Matrix Values at which mitigation is recommended. Soil vapor sample locations and summary of analytical results are shown in Figure 5.

2.6 Areas of Concern

The following Areas of Concern (AOCs) were assigned based on a review of previous environmental reports and historical analytical data. AOC locations are shown on Figure 6. A discussion of the proposed investigation of these AOCs is presented in Section 3.

AOC 1: Polycyclic Aromatic Hydrocarbon (PAH) Impacts in Northwest Corner of Site

AOC 1 represents SVOC (specifically PAH)-impacted shallow soil in the northwestern corner of the site, where concentrations of PAHs (including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and

indeno(1,2,3-cd)pyrene) were detected at concentrations one order of magnitude greater than in other site soil from 0 to 1 feet bgs. Soil impacted with PAHs above what was observed throughout the site in AOC 1 may be related to either historical site use or a historical petroleum release.

AOC 1 will be investigated during RIWP implementation by advancing four soil borings (SB11 to SB14) around SB02 to native soil. Soil samples will be collected from 0 to 2, 2 to 4, and 4 to 6 feet bgs and analyzed for NYSDEC Part 375 SVOCs. If the vertical and horizontal extent of PAH-impacted soil is not delineated by the proposed samples, it will be defined during a forthcoming waste characterization that will be performed to characterize soil for acceptance at an off-site disposal facility. An additional sample will be collected at the first occurrence of native soil in SB14 to delineate the extent of historic fill material and analyzed for the full list of parameters discussed in Section 3.2.2. Soil boring SB11 will be completed as a permanent monitoring well, which will be developed and sampled.

AOC 2: Barium Impacts in Northeast Corner of Site

AOC 2 represents metal-impacted shallow soil in the northeastern corner of the site, where barium was reported at a concentration of 2,320 mg/kg in boring SB06 from 0 to 2 feet bgs. Soil impacted with metals within AOC 2 may be a result of historical site use as an illegal chop shop or historic fill quality.

AOC 2 will be investigated during RIWP implementation by advancing two soil borings (SB16 and SB17) to native soil and installing and sampling one groundwater monitoring well (MW16). Soil samples will be collected from 0 to 2, 2 to 4 and 4 to 6 feet bgs and analyzed for NYSDEC Part 375 total metals plus metals via Toxicity Characteristic Leaching Procedure (TCLP). If the vertical and horizontal extent of metal-impacted soil is not delineated by the proposed samples, it will be defined during a forthcoming waste characterization that will be performed to characterize soil for acceptance at an off-site disposal facility. An additional sample will be collected at the first occurrence of native soil in SB17 to delineate the extent of historic fill material and analyzed for the full list of parameters discussed in Section 3.2.2.

AOC 3: Lead and Barium Impacts in the Eastern Portion of the Site

AOC 3 represents metal-impacted shallow soil in the eastern corner of the site, where lead and barium were detected from 0 to 2 feet bgs at concentrations of 8,530 mg/kg and 9,060 mg/kg, respectively, in soil boring SB07. Soil impacted with metals within AOC 3 may be a result of historical site use as an illegal chop shop or historic fill quality.

AOC 3 will be investigated during RIWP implementation by advancing four soil borings (SB18 through SB21) to native soil and installing and sampling one groundwater monitoring well

(MW18) at about 45 feet bgs. Soil samples will be collected from 0 to 2, 2 to 4 and 4 to 6 feet bgs and analyzed for NYSDEC Part 375 total metals plus metals via TCLP. If the vertical and horizontal extent of metal-impacted soil is not delineated by the proposed samples, it will be defined during a forthcoming waste characterization that will be performed to characterize soil for acceptance at an off-site disposal facility. An additional sample will be collected at the first occurrence of native soil in SB21 to delineate the extent of historic fill material and analyzed for the full list of parameters discussed in Section 3.2.2.

AOC 4: Lead, Barium, and Mercury Impacts in the Southwest Corner of the Site

AOC 4 represents metal-impacted shallow soil in the southwest corner of the site, where lead, barium, and mercury were detected from 0 to 2 feet bgs at concentrations of 1,070 mg/kg, 3,200 mg/kg, and 7.43 mg/kg, respectively, in soil boring SB03. Soil impacted with metals within AOC 4 may be a result of historical site use as an illegal chop shop or historic fill quality.

AOC 4 will be investigated during RIWP implementation by advancing four soil borings (SB23 through SB26) to native soil and installing and sampling one groundwater monitoring well (MW26) at about 45 feet bgs. Soil samples will be collected from 0 to 2, 2 to 4 and 4 to 6 feet bgs and analyzed for NYSDEC Part 375 total metals plus metals via TCLP. If the vertical and horizontal extent of metal-impacted soil is not delineated by the proposed samples, it will be defined during a forthcoming waste characterization that will be performed to characterize soil for acceptance at an off-site disposal facility. An additional sample will be collected at the first occurrence of native soil in SB26 to delineate the extent of historic fill material and analyzed for the full list of parameters discussed in Section 3.2.2.

AOC 5: Historic Fill Material and Historical Site Uses (Site-Wide)

Historic fill material was observed throughout the site in the 10 previous borings. Contaminants of concern in historic fill material and related to historical site uses as an illegal chop shop and automobile scrap yard/maintenance include SVOCs, metals, VOCs, pesticides, and PCBs.

AOC 5 will be investigated during RIWP implementation by advancing soil borings SB15, SB22, SB27, and SB28 to native soil or the anticipated development depth of 15 feet bgs, whichever is deeper. Up to three representative soil samples will be collected from AOC 5 soil boring within historic fill material and another at the first occurrence of native soil or the development depth, whichever is deeper, and analyzed for the full list of parameters discussed in Section 3.2.2. The investigation of AOC 5 will also include installation and sampling 5 groundwater monitoring wells (MW11, MW16, MW18, MW26, and MW27) at about 45 feet bgs, and installation and sampling and 6 soil vapor probes (SV11, SV16, SV18, SV22, SV26, and SV27) at about 15 feet bgs.

3.0 SCOPE OF WORK

The objective of this RIWP is the "investigation and characterization of the nature and extent of the contamination within the boundary of the site", per Environmental Conservation Law (ECl) Article 27, Title 14 (Brownfield Legislation). This section presents the sampling rationale in relation to the AOCs and details the proposed investigation scope of work.

The RI will be conducted in accordance with ECL Article 27, Title 14, 6 NYCRR Part 375-3.8, NYSDEC DER-10, and the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The objectives and goals of the RI are listed below.

- Define the nature and extent of contamination in all media at the site
- Evaluate the potential for contamination in all media to emanate from the site
- Generate sufficient data to evaluate the remedial action alternatives
- Generate sufficient data to evaluate the actual and potential threats to human health and the environment

The field investigation will include the tasks listed below to supplement the data and findings of the previous investigation. The rationale for each sample location in relation to the AOCs is provided in Table 1. Proposed sample locations are shown on Figure 6.

- <u>Soil Borings and Sampling</u>
    - Advancement of 17 soil borings (SB11 through SB28) to native soil or the development depth (about 15 feet bgs), whichever is deeper. Borings that will be converted to permanent monitoring wells will be advanced to about 45 feet bgs.
    - Collection of up to 4 soil samples from borings SB15, SB22, SB27, and SB28 (plus quality assurance/quality control [QA/QC] sampling).
    - The remaining borings (SB11 – SB14, SB16 – SB17, SB18 – SB21, and SB23 – SB26) will be advanced to delineate metals and PAHs. A minimum of three samples will be collected from each delineation boring (plus QA/QC samples) and analyzed for the contaminant of concern (i.e., Part 375 metals or SVOCs). Samples collected from 0 to 2 feet bgs at soil borings SB16 and SB17 (AOC2), SB18 through SB21 (AOC 3), and SB23 through SB26 (AOC 4) will also be analyzed for TCLP metals. Additional TCLP analysis may be considered for deeper samples if warranted by total metal concentrations. A separate sample will be collected from the top of native material within borings SB14, SB17, SB21, and SB26 for analysis of the full parameter list in Section 3.2.2 and shown in Table 1.

- Monitoring Well Installation and Sampling
  - Installation of five monitoring wells (MW11, MW16, MW18, MW26, and MW27) co-located with soil boring locations. The five wells will be installed to about 45 feet bgs and screened across the groundwater table.
  - Collection of one groundwater samples from each monitoring well for a total of five groundwater samples (plus QA/QC sampling) for analysis of the fill list or parameters in Section 3.2.2.
  - Survey and synoptic gauging of monitoring wells to evaluate groundwater flow direction.
- Soil Vapor Point Installation and Sampling
  - Installation of six soil vapor probes (SV11, SV16, SV18, SV22, SV26, and SV27) to the proposed development depth (12 – 15 feet bgs) and collection of one soil vapor sample from each probe for a total of six soil vapor samples and analyzed for VOCs via EPA method TO-15..
  - One outdoor ambient air sample will be collected as a QA/QC measure and for comparison.

A geophysical survey was previously completed and will be used to assist in moving boring locations, as needed. Modifications to this scope of work may be required: 1) due to site conditions, equipment limitations or access restrictions; 2) due to geophysical survey results or if unexpected contamination is encountered and additional analytical data is needed; and 3) to adequately characterize and delineate AOCs in compliance with applicable regulations and investigation guidance documents (e.g., DER-10).

The field investigation work will be completed in accordance with the procedures specified in Langan's Health and Safety Plan (HASP) and Quality Assurance Project Plan (QAPP) provided in Appendices B and C, respectively.

Names, contact information, and roles of the personnel who will participate in the investigation including the NYSDEC/NYSDOH personnel, project manager, contractor, and subcontractor contacts are listed below. Résumés for each Langan employee participating in the investigation are provided in the QAPP (Appendix C).

Personnel	Investigation Role	Contact Information
Daniel McNally NYSDEC	NYSDEC Point of Contact	Phone – 518-402-9143 Email – Daniel.mcnally@dec.ny.gov
Wendy Kuehner NYSDOH	NYSDOH Point of Contact	Phone – 518-402-7860 Email – wendy.kuehner@health.ny.gov
Michael D. Burke, P.G., CHMM Langan Engineering	Project Director	Phone – 212-479-5413 Email – mburke@langan.com

Personnel	Investigation Role	Contact Information
Jason Hayes, P.E. Langan Engineering	Project Engineer	Phone – 212-479-5427 Email – jahayes@langan.com
Jennifer Armstrong, CHMM Langan Engineering	Project Manager	Phone – 212-479-5537 Email – jarmstrong@langan.com
Tony Moffa, CHMM, CSP Langan Engineering	Langan Health & Safety Officer	Phone – 215-491-6500 Email – tmoffa@langan.com
Bill Bohrer, P.G. Langan Engineering	Field Safety Officer	Phone – 410-984-3068 Email – wbohrer@langan.com
James Robinson, PG, PE Langan Engineering	Field Team Leader	Phone – 212-479-5565 Email – jrobinson@langan.com
Scott Hamarich Eastern Environmental Solutions, Inc	Drilling Contractor	Phone – 631-727-2700 Email – ch@easternenviro.com
Levent Eskicakit, P.G., E.P. NOVA	Geophysical Contractor	Phone – 347-556-7787 Email – levent@nova-gsi.com
Richard August York Analytical Laboratories	Laboratory Contractor	Phone – 203-325-1371, ext. 834 Email – raugust@yorklab.com
Emily Strake, CEP Langan Engineering	Data Validator / Program Quality Assurance Manager	Phone – 215-491-6500 Email – estrake@langan.com

3.1 Geophysical Survey

A geophysical survey was completed in 2018 prior to drilling for the limited sub-surface investigation. The survey used geophysical instruments, including electromagnetic instruments and ground-penetrating radar (GPR). Anomalies consistent with buried tanks were not identified. Underground utility lines were identified along the northern site border and in the northwest corner of the site.

3.2 Soil Investigation

3.2.1 Drilling and Logging

An environmental drilling subcontractor will advance 17 soil borings (designated SB11 through SB28) to the development depth (about 15 feet bgs) or native soil, whichever is deeper. Borings that will be converted to a permanent groundwater monitoring well will be advanced to about 45 feet bgs. The purpose of these borings is to supplement the previous environmental investigation by further investigating the AOCs identified in Section 2.4; soil boring location rationale is provided in the following table:

AOC	Proposed Soil Boring ID	Rationale
AOC 1	SB11 through SB14	Four soil borings to delineate the extent of PAH-impacted soil within the northwestern portion of the site.
AOC 2	SB16 and SB17	Two soil borings to delineate the extent of barium-impacted soil within the northeastern portion of the site.

AOC	Proposed Soil Boring ID	Rationale
AOC 3	SB18 through SB21	Four soil borings to delineate the extent of lead and barium impacted soil within the eastern portion of the site.
AOC 4	SB23 through SB27	Four soil borings to delineate the extent of lead, barium, and mercury impacted soil within the southwestern portion of the site.
AOC 5 and 6	SB15, SB22, SB 27, and SB28	Soil borings to investigate historic fill material and historic site uses

Additional soil borings may be advanced if horizontal or vertical delineation is necessary based on field screening or initial analytical results.

A Langan engineer will document the work, screen the soil samples for environmental impacts, and collect environmental samples for laboratory analyses. Work will comply with the safety guidelines outlined in the HASP (Appendix B). Soil borings will be advanced to the development depth (about 15 feet bgs) or native soil, whichever is deeper using a direct-push sampler (Geoprobe®). Borings that will be converted to permanent monitoring wells will be advanced to around 45 feet bgs. Soil will be screened continuously to the boring termination depth for organic vapors with a photoionization detector (PID) equipped with a 10.6 electron volt (eV) bulb and for visual and olfactory indications of environmental impacts (e.g., staining and odor). Soil descriptions will be recorded in field boring logs.

3.2.2 Soil Sampling

Delineation Borings

Delineation borings (SB11 – SB14, SB16 – SB17, SB18 – SB21, and SB23 – SB26) will be advanced to the development depth or native soil, whichever is deeper. Three grab samples will be collected from each delineation boring from the 0 - 2, 2 - 4, and 4 – 6-foot depth intervals and analyzed for the contaminant of concern associated with each AOC. A separate sample will be collected from the top of native material within borings SB14, SB17, SB21, and SB26 for analysis of the full parameter list in Section 3.2.2 and shown in Table 1.

Site-wide Investigation Borings

Up to 4 grab soil samples will be collected from each of the borings SB15, SB22, SB27, and SB28 to evaluate site-wide AOC 5. Within each of these borings, 3 samples will be collected from historic fill material. If visible, olfactory, or instrumental evidence of contamination is not observed, representative samples of historic fill material will be collected. If gross impacts are observed, a sample will be collected from the interval of greatest apparent impact and from the first occurrence of soil that is not visibly impacted. One sample will be collected from the first occurrence of native soil or the development depth, whichever is deeper.

In the event that environmental impacts (i.e., visual observations, odors or PID readings above background) are apparent at the proposed terminal depth, soil borings will be advanced until refusal or until impacts are no longer apparent. Non-disposable down-hole drilling equipment and sampling apparatus will be decontaminated between locations with Alconox® and water. Following sampling, each soil boring that is not completed with a groundwater monitoring well will be backfilled using excess (non-impacted) soil cuttings and/or bentonite grout.

Soil samples will be collected in laboratory-supplied containers and will be sealed, labeled, and placed in a cooler containing ice (to maintain a temperature of approximately 4 degrees Celsius) for delivery to York Analytical Laboratory (York), an NYSDOH Environmental Laboratory Approval Program (ELAP)-certified analytical laboratory, or another NYSDOH ELAP-certified lab.

Analysis

Soil samples will be analyzed for the following analyses:

- AOC 1: NYSDEC Part 375 SVOCs (PAHs) via USEPA Method 8270D;
- AOC 2: NYSDEC Part 375 metals (USEPA Method 6010D) and TCLP metals (if necessary)
- AOC 3: NYSDEC Part 375 metals (USEPA Method 6010D) and TCLP metals (if necessary)
- AOC 4 : NYSDEC Part 375 metals (USEPA Method 6010D) and TCLP metals (if necessary)
- AOC 5: NYSDEC Part 375/TCL VOCs (USEPA Method 8260C), SVOCs (USEPA Method 8270D), PCBs (USEPA Method 8082A), pesticides (USEPA Method 8081B), herbicides (EPA Method 8260C), metals (USEPA Method 6010C/7000 series, including hexavalent and trivalent chromium), and total cyanide (USEPA Method 9010C/9014), 1,4-dioxane (EPA Method 8270 SIM) and per- and polyfluoroalkyl substance (PFAS/PFOS) by EPA Method 537M (2009).

QA/QC procedures to be followed are described in the QAPP provided as Appendix C. Table 1 summarizes the proposed soil samples, including QA/QC samples.

3.3 Groundwater Investigation

3.3.1 Installation of Monitoring Wells

The proposed monitoring well locations (MW11, MW16, MW18, MW26, and MW27) are shown on Figure 6. At each monitoring well location, a soil boring will be advanced using Sonic® drilling methods to termination depth (about 45 feet bgs) or refusal. During well installation, soil conditions will be screened, logged, and sampled as described above in Section 3.2.1. Upon completion, the soil boring will be converted into a permanent monitoring well.

The wells will be constructed using 2-inch diameter, Schedule 40 polyvinyl chloride (PVC) riser pipe with 10 feet of Schedule 40 0.01-inch slotted screen. Clean sand will be used to fill the annulus around each screened interval to a height of about 2 feet above the screen. Each well will be backfilled to 1 foot bgs using clean sand, bentonite chips, or grout. The wells will be finished with locking J-plugs and flush-mounted steel manhole covers set into concrete.

Following installation, the wells will be developed using a surge block and submersible pump to agitate and remove fines. The wells will be purged via pumping until the water becomes clear (having turbidity less than 50 Nephelometric Turbidity Units [NTU]). All developed wells will then be allowed to sit for a minimum of one week prior to collecting groundwater samples.

3.3.2 Monitoring Well Survey

Langan will survey the location and elevation of the groundwater monitoring wells (top of casing elevations). This data will be used with groundwater well gauging data collected during RIWP implementation to prepare a groundwater contour map and document the direction of groundwater flow. Vertical control will be established by surveying, performed relative to the NAVD88[1] datum by a NYS-licensed land surveyor. Elevations of the top of monitoring well casings and protective well casings will be surveyed to the nearest 0.01 foot.

3.3.3 Groundwater Sampling

One groundwater sample will be collected from each of the five monitoring wells (MW11, MW16, MW18, MW26, and MW27), plus QA/QC samples. Prior to sampling, Langan will document static water levels during a synoptic gauging event. Pre-sample purging will consist of pumping, at minimum, the stabilized drawdown volume plus the pump's tubing volume, and waiting until the physical and chemical parameters (e.g., temperature, dissolved oxygen, oxygen reduction potential, turbidity) stabilize within the ranges specified in the United States Environmental Protection Agency (USEPA) Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples From Monitoring Wells, dated July 30, 1996 and revised September 19, 2017. Samples will be collected with a bladder pump and dedicated polyethylene tubing. Development and purge water will be containerized for off-site disposal.

Groundwater samples from MW11, MW16, MW18, MW26, and MW27 will be analyzed by York for NYSDEC Part 375/TCL VOCs (EPA Method 8260C), SVOCs (EPA Method 8270D), Pesticides (EPA Method 8081B), PCBs (EPA Method 8082A), herbicides (EPA Method 8151A), total/dissolved (field-filtered) metals (including hexavalent and total chromium) (EPA Method

[1] North American Vertical Datum of 1988. Datum refers to the North American Vertical Datum of 1988 (NAVD88) which is approximately 1.1 feet above mean sea level datum at Sandy Hook New Jersey as defined by the United States Geologic Survey (USGS NGVD 1929).

6010C), 1,4-dioxane by USEPA Method 8270 SIM, and the list of per- and polyfluoroalkyl compounds (PFCs) in the following table via EPA method 537M by York.

Group	Compound Name	Abbreviation	CAS No.
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanessulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctanesul-fonamides	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorooctanesul-fonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

QA/QC procedures are described in the QAPP, provided as Appendix C. Groundwater sampling for PFAS and 1,4-dioxane will be performed in accordance with the April 2019 NYSDEC guidance on Groundwater Sampling for Emerging Contaminants and the June 29, 2016 NYSDEC guidance on Collection of Groundwater Samples for Perfluorooctanoic Acid and Perfluorinated Compounds from Monitoring Wells Sample Protocol, which is attached to the enclosed QAPP. Table 1 summarizes the proposed groundwater samples, including QA/QC samples.

3.4 Soil Vapor Sampling

3.4.1 Installation of Soil Vapor Probes

Six soil vapor sampling probes (SV11, SV16, SV18, SV22, SV26, and SV27) will be installed at the locations shown on Figure 6. Table 1 provides rationale for the sample location in relation to each AOC.

A subcontracted environmental driller will install each soil vapor probe to the proposed development depth of about 15 feet bgs. The soil vapor probes will consist of a dedicated 1-7/8-

inch polyethylene implant threaded into polyethylene tubing that will extend to surface grade. A clean sand filter pack will be placed around the screen implant and the remaining annular space will be sealed with hydrated bentonite. The seal of all soil vapor probes will be checked with a helium tracer gas test both before and after sample collection.

3.4.2 Soil Vapor Sampling

As a QA/QC measure, an inert tracer gas (helium) will be introduced into an above-grade sampling chamber to ensure that the soil vapor sampling points are properly sealed above the target sampling depth, thereby preventing subsurface infiltration of ambient air. Prior to sampling, three probe/tubing assembly volumes will be purged from each point using a multi-gas monitor at a rate of less than 0.2 liters per minute. The multi-gas monitor will also be used to screen the soil vapor for the presence of VOCs. Following purging, each soil vapor point will be sampled using laboratory-provided, 2.7-liter air canisters equipped with 2-hour sample interval flow controllers. Soil vapor samples will be analyzed by York for VOCs by USEPA Method TO-15. QA/QC procedures are described in the QAPP provided as Appendix C. Table 1 summarizes the proposed soil vapor samples.

3.5 Data Management, Validation, and Deliverables

Laboratory analyses of soil, groundwater, and soil vapor samples will be conducted by York in accordance with USEPA SW-846 methods and NYSDEC Analytical Services Protocol (ASP) Category B deliverable format. Environmental data will be reported electronically using the database software application EQuIS™, as part of NYSDEC's Environmental Information Management System (EIMS).

QA/QC procedures required by the NYSDEC ASP and SW-846 methods, including initial and continuing instrument calibrations, surrogate compound spikes, and analysis of other samples (blanks, laboratory control samples, and matrix spikes/matrix spike duplicates) will be followed. The laboratory will provide sample bottles that have been pre-cleaned and preserved in accordance with the SW-846 methods. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP shall take precedence.

Data validation will be performed in accordance with the USEPA validation guidelines for organic and inorganic data review. Validation will include the following:

- Verification of QC sample results (both qualitative and quantitative).
- Verification of sample results (both positive hits and non-detects).
- Recalculation of 10 percent of all investigative sample results.
- Preparation of a Data Usability Summary Report (DUSR).

The DUSR will be prepared and reviewed by the Program Quality Assurance Monitor (PQAM) and 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. A detailed assessment of each sample delivery group will follow. Additional details on the DUSR are provided in the QAPP in Appendix C.

3.6 Management of Investigation-Derived Waste

The following investigation-derived wastes (IDW) will be containerized in separate 55-gallon, United Nations (UN)/Department of Transportation (DOT)-approved drums and disposed of at an off-site facility permitted to accept such material upon receipt of laboratory analysis:

- Visually impacted soil cuttings
- Soil cuttings generated from borings converted to monitoring wells (cuttings at these locations are not to be used to fill well annulus to grade)
- Well development and purge water
- Decontamination water and contaminated sampling supplies

Soil cuttings (from locations not converted to monitoring wells) without observable impacts (i.e. free hydrocarbon product, odors, elevated PID readings) will be placed back down the borehole from which they were generated. All drums will be properly labeled, sealed, and waste characterized as necessary. The drums will be staged in a secure area on-site, pending disposal at a facility permitted to accept such material upon receipt of analytical results. Management of IDW will comply with NYSDEC DER-10 3.3(e).

3.7 Air Monitoring

Air monitoring will be conducted for site workers (Health and Safety Plan) and the community (Community Air Monitoring Program [CAMP]). Fugitive particulate (dust) generation that could affect site workers or the public is not expected because intrusive work is limited to boring, monitoring well, and vapor probe installation, which does not disturb large volumes of soil.

Dust emissions will be monitored using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level (e.g., DustTrak) and a PID will be used to screen for VOCs. Dust suppression measures (e.g., water misting) will be implemented as required. All PIDs used will be equipped with a 10.6 eV bulb.

3.7.1 Worker Air Monitoring

Langan will conduct air monitoring of the breathing zone periodically during drilling and sampling activities to evaluate proper health and safety protection for the Langan work team. Initially, ambient air monitoring will be performed within the work area. Langan will monitor VOCs with a PID (MultiRAE 2000, 3000, or equivalent) in accordance with the HASP (Appendix B). If air monitoring during intrusive operations identifies the presence of VOCs, on-site personnel will follow the guidelines outlined in the HASP regarding action levels, permissible exposure, engineering controls, and personal protective equipment. If the VOC action level is exceeded, work will cease and the work location will be evacuated. Monitoring will be continued until the levels drop to safe limits. At that time, work can resume with continued monitoring. If high levels persist, field activities will be halted and the work relocated to another area. If dust emissions are observed, work will stop and dust suppression measures will be used.

3.7.2 Community Air Monitoring Plan

In addition to air monitoring in the worker breathing zone, Langan will conduct community air monitoring in compliance with the NYSDOH Generic CAMP. CAMP deployment with comply with NYSDEC DER-10 Appendix 1A and Appendix 1B.

Langan will conduct periodic monitoring for VOCs during non-intrusive work such as the collection of groundwater samples. Periodic monitoring may include obtaining measurements upon arrival at a location, when opening a monitoring well cap, when bailing/purging a well, and upon departure from a location.

Langan will also conduct monitoring for VOCs during ground-intrusive work (i.e., soil boring advancement and monitoring well installation). Langan will measure upwind concentrations at the start of each workday, and periodically thereafter, to establish background concentrations. Langan will monitor VOCs at the downwind perimeter of the work zone, which will be established at a point on the site where the general public or site employees may be present. Monitoring will be conducted with a PID. Dust emissions will be monitored using real-time monitoring equipment capable of measuring PM-10 and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level (e.g., DustTrak). If dust emissions are observed, work will stop and dust suppression measures will be used. Community air monitoring requirements will be conducted until it is determined that the site is not a source of organic vapors.

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

When work areas are within 20 feet of potentially-exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must take into consideration the

nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings. The special requirements may apply when work is conducted near any the occupied building to the east of the site.

- If total VOC concentrations near air intake vents for adjacent structures exceed 1 ppm, VOC monitoring should occur within the occupied structure(s). Background readings in the occupied spaces will be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations near air intake vents for adjacent structures exceed 150 micrograms per cubic meter ($\mu g/m^3$), work activities will be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 μ/m^3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

3.8 Qualitative Human Health Exposure Assessment

A Qualitative Human Health Exposure Assessment will be conducted in accordance with Appendix 3B of NYSDEC DER-10. The assessment will be submitted as part of the Remedial Investigation Report.

4.0 REPORTING

4.1 Daily Field Reports

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

- An update of progress made during the reporting day
- Photographic documentation of the activities completed during the reporting day
- Identification of samples collected during the reporting day
- Locations and references to a site map for completed activities
- A summary of any and all complaints with relevant details (names, phone numbers)
- A summary of CAMP findings, including elevated concentrations and response actions
- An explanation of notable site conditions
- A list of anticipated work for the following reporting day

Daily reports are not intended to notify the NYSDEC of emergencies (e.g., accident, spill), request changes to the RIWP, or communicate other sensitive or time-critical information. However, such conditions will also be included in the daily reports. Emergency conditions and changes to the RIWP will be communicated directly to the NYSDEC Project Manager.

4.2 Remedial Investigation Report

Following completion of the supplemental remedial investigation and receipt of analytical data, a Remedial Investigation Report (RIR) will be prepared. The RIR will compile the remedial investigation activities completed to date.

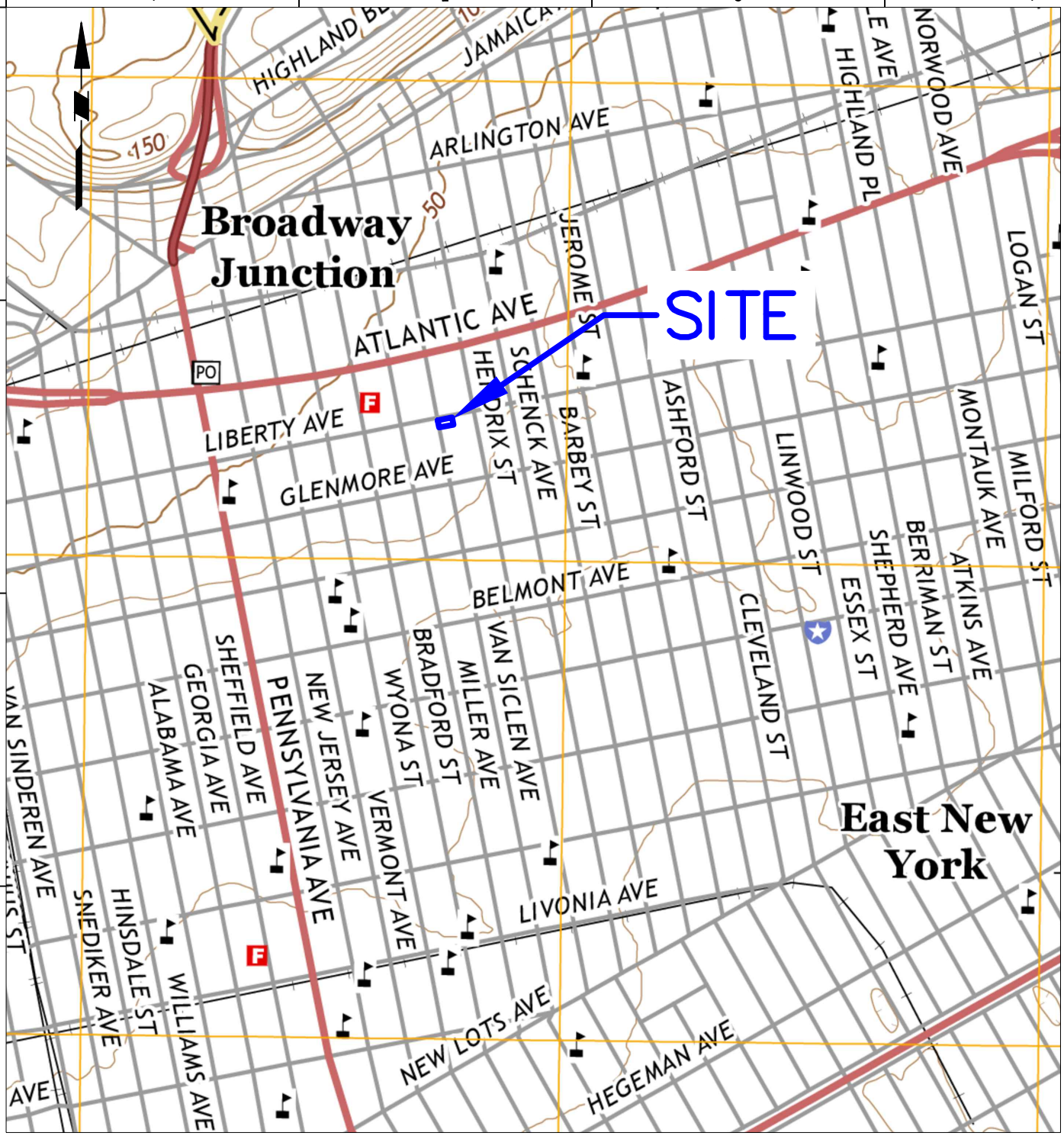
The RIR will include: 1) a summary of the site history and previous investigations; 2) description of site conditions and this remedial investigation; 3) sampling methodology and field observations; 4) evaluation of the results and findings; and 5) conclusions and recommendations pertaining to the remedial action objectives and recommendations for any future assessment, if warranted. The standards, criteria, and guidance (SCGs) that pertain to the site location and contaminants, as well as, potential remedial action objectives will be identified in the report. The soil boring logs, monitoring well and soil vapor point construction logs, sampling logs, and laboratory analytical reports will be appended to the report. Conclusions and recommendations will be provided that: 1) summarize the nature and extent of potential impact for each AOC; 2) identify unacceptable exposure pathways (as determined through a Qualitative Human Health Exposure Assessment); and 3) recommend future work or remedial actions, as required.

The sampling results that exceed UU and RRU SCOs, the groundwater standards, or other applicable SCGs will be summarized in tables. The tables will include sample location, media sampled, sample depth, field/laboratory identification numbers, analytical results, and the applicable SCG for comparison. Scaled site maps will be used to show the boring, monitoring well, and vapor probe locations, SCG exceedances, groundwater elevation contours, groundwater flow direction, and, if appropriate, groundwater contaminant concentration contours. The remediation strategy and cleanup track will be proposed in a Remedial Action Work Plan following completion of the RIR.

4.3 Project Schedule

It is anticipated that the field portion of the RIWP will be implemented in 2019 and Certificate of Completion is anticipated in 2021. A detailed schedule presenting the anticipated Remedial Action Work Plan (RAWP) and redevelopment timeline is included in Appendix D.

FIGURES



NOTES:

1. BASE MAPS ADAPTED FROM UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5-MINUTE WEEHAWKEN (NEW JERSEY), CENTRAL PARK (NEW YORK), JERSEY CITY (NEW JERSEY), AND BROOKLYN (NEW YORK) TOPOGRAPHIC QUADRANGLES, DATED 2016.

1000 0 500 1000

SCALE IN FEET

LANGAN

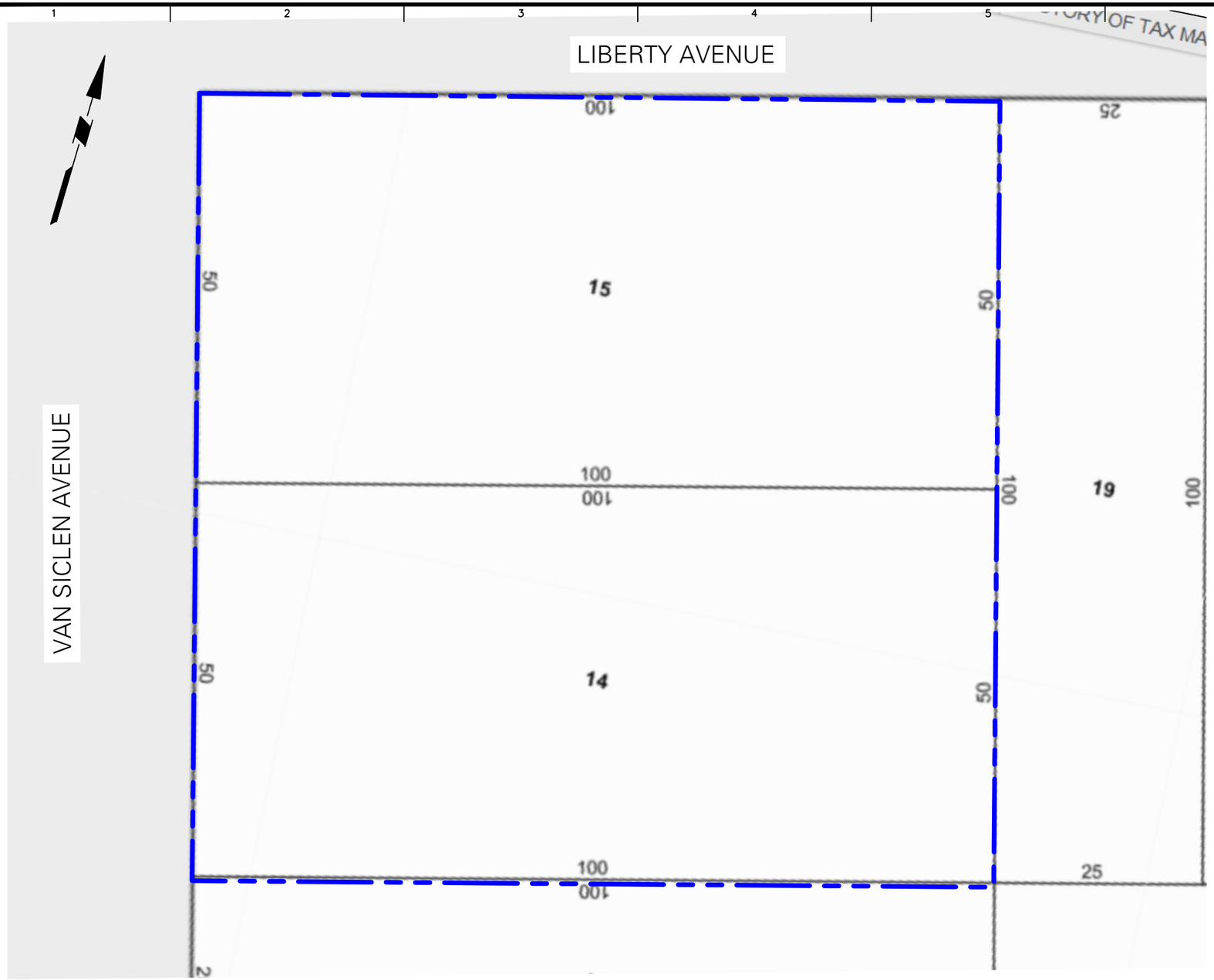
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001

T: 212.479.5400 F: 212.479.5444 www.langan.com

Project
203-211 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

Figure Title
SITE LOCATION MAP

Project No. 170513001	Figure No. 1
Date 03/15/2019	
Drawn By ERA	
Checked By PM	Sheet 1 of 6



LEGEND:

APPROXIMATE SITE BOUNDARY

NOTE:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM

15 0 7.5 15

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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

Project

203-207 VAN SICLEN AVENUE

BLOCK No. 3978, LOT Nos. 14 & 15

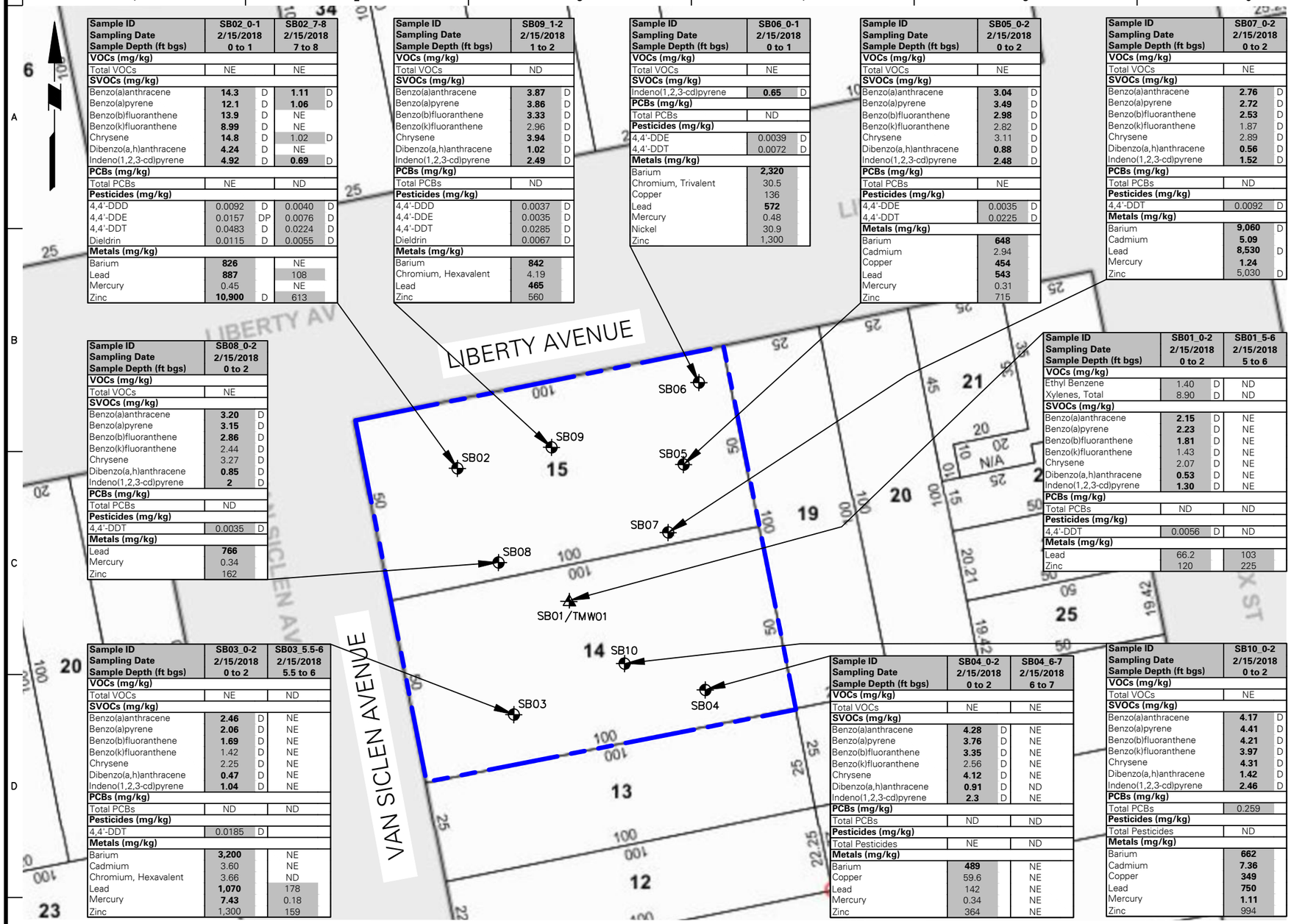
BROOKLYN **NEW YORK**

Figure Title

SITE PLAN

Project No. 170513001	Figure No. 2
Date 3/15/2019	
Drawn By KN	
Checked By JA	Sheet 2 of 6

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\Subsurface Investigation\Figure 2 - Site Plan - RI.dwg Date: 3/25/2019 Time: 18:53 User: knagotko Style Table: Langan.stb Layout: Sample Location Map



Sample ID	SB02_0-1		SB02_7-8	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 1		7 to 8	
VOCs (mg/kg)				
Total VOCs	NE		NE	
SVOCs (mg/kg)				
Benzo(a)anthracene	**14.3**	D	**1.11**	D
Benzo(a)pyrene	**12.1**	D	**1.06**	D
Benzo(b)fluoranthene	**13.9**	D	NE	
Benzo(k)fluoranthene	**8.99**	D	NE	
Chrysene	**14.8**	D	1.02	D
Dibenzo(a,h)anthracene	**4.24**	D	NE	
Indeno(1,2,3-cd)pyrene	**4.92**	D	**0.69**	D
PCBs (mg/kg)				
Total PCBs	NE		ND	
Pesticides (mg/kg)				
4,4'-DDD	0.0092	D	0.0040	D
4,4'-DDE	0.0157	DP	0.0076	D
4,4'-DDT	0.0483	D	0.0224	D
Dieldrin	0.0115	D	0.0055	D
Metals (mg/kg)				
Barium	**826**		NE	
Lead	**887**		108	
Mercury	0.45		NE	
Zinc	**10,900**	D	613	

Sample ID	SB09_1-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	1 to 2	
VOCs (mg/kg)		
Total VOCs	ND	
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.87**	D
Benzo(a)pyrene	**3.86**	D
Benzo(b)fluoranthene	**3.33**	D
Benzo(k)fluoranthene	2.96	D
Chrysene	**3.94**	D
Dibenzo(a,h)anthracene	**1.02**	D
Indeno(1,2,3-cd)pyrene	**2.49**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDD	0.0037	D
4,4'-DDE	0.0035	D
4,4'-DDT	0.0285	D
Dieldrin	0.0067	D
Metals (mg/kg)		
Barium	**842**	
Chromium, Hexavalent	4.19	
Lead	**465**	
Zinc	560	

Sample ID	SB06_0-1	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 1	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Indeno(1,2,3-cd)pyrene	**0.65**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDE	0.0039	D
4,4'-DDT	0.0072	D
Metals (mg/kg)		
Barium	**2,320**	
Chromium, Trivalent	30.5	
Copper	136	
Lead	**572**	
Mercury	0.48	
Nickel	30.9	
Zinc	1,300	

Sample ID	SB05_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.04**	D
Benzo(a)pyrene	**3.49**	D
Benzo(b)fluoranthene	**2.98**	D
Benzo(k)fluoranthene	2.82	D
Chrysene	3.11	D
Dibenzo(a,h)anthracene	**0.88**	D
Indeno(1,2,3-cd)pyrene	**2.48**	D
PCBs (mg/kg)		
Total PCBs	NE	
Pesticides (mg/kg)		
4,4'-DDE	0.0035	D
4,4'-DDT	0.0225	D
Metals (mg/kg)		
Barium	**648**	
Cadmium	2.94	
Copper	**454**	
Lead	**543**	
Mercury	0.31	
Zinc	715	

Sample ID	SB07_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**2.76**	D
Benzo(a)pyrene	**2.72**	D
Benzo(b)fluoranthene	**2.53**	D
Benzo(k)fluoranthene	1.87	D
Chrysene	2.89	D
Dibenzo(a,h)anthracene	**0.56**	D
Indeno(1,2,3-cd)pyrene	**1.52**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDT	0.0092	D
Metals (mg/kg)		
Barium	**9,060**	D
Cadmium	**5.09**	
Lead	**8,530**	D
Mercury	**1.24**	
Zinc	5,030	D

Sample ID	SB08_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.20**	D
Benzo(a)pyrene	**3.15**	D
Benzo(b)fluoranthene	**2.86**	D
Benzo(k)fluoranthene	2.44	D
Chrysene	3.27	D
Dibenzo(a,h)anthracene	**0.85**	D
Indeno(1,2,3-cd)pyrene	**2**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDT	0.0035	D
Metals (mg/kg)		
Lead	**766**	
Mercury	0.34	
Zinc	162	

Sample ID	SB01_0-2		SB01_5-6	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 2		5 to 6	
VOCs (mg/kg)				
Ethyl Benzene	1.40	D	ND	
Xylenes, Total	8.90	D	ND	
SVOCs (mg/kg)				
Benzo(a)anthracene	**2.15**	D	NE	
Benzo(a)pyrene	**2.23**	D	NE	
Benzo(b)fluoranthene	**1.81**	D	NE	
Benzo(k)fluoranthene	1.43	D	NE	
Chrysene	2.07	D	NE	
Dibenzo(a,h)anthracene	**0.53**	D	NE	
Indeno(1,2,3-cd)pyrene	**1.30**	D	NE	
PCBs (mg/kg)				
Total PCBs	ND		ND	
Pesticides (mg/kg)				
4,4'-DDT	0.0056	D	ND	
Metals (mg/kg)				
Lead	66.2		103	
Zinc	120		225	

Sample ID	SB03_0-2		SB03_5.5-6	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 2		5.5 to 6	
VOCs (mg/kg)				
Total VOCs	NE		ND	
SVOCs (mg/kg)				
Benzo(a)anthracene	**2.46**	D	NE	
Benzo(a)pyrene	**2.06**	D	NE	
Benzo(b)fluoranthene	**1.69**	D	NE	
Benzo(k)fluoranthene	1.42	D	NE	
Chrysene	2.25	D	NE	
Dibenzo(a,h)anthracene	**0.47**	D	NE	
Indeno(1,2,3-cd)pyrene	**1.04**	D	NE	
PCBs (mg/kg)				
Total PCBs	ND		ND	
Pesticides (mg/kg)				
4,4'-DDT	0.0185	D		
Metals (mg/kg)				
Barium	**3,200**		NE	
Cadmium	3.60		NE	
Chromium, Hexavalent	3.66		ND	
Lead	**1,070**		178	
Mercury	**7.43**		0.18	
Zinc	1,300		159	

Sample ID	SB04_0-2		SB04_6-7	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 2		6 to 7	
VOCs (mg/kg)				
Total VOCs	NE		NE	
SVOCs (mg/kg)				
Benzo(a)anthracene	**4.28**	D	NE	
Benzo(a)pyrene	**3.76**	D	NE	
Benzo(b)fluoranthene	**3.35**	D	NE	
Benzo(k)fluoranthene	2.56	D	NE	
Chrysene	**4.12**	D	NE	
Dibenzo(a,h)anthracene	**0.91**	D	ND	
Indeno(1,2,3-cd)pyrene	**2.3**	D	NE	
PCBs (mg/kg)				
Total PCBs	ND		ND	
Pesticides (mg/kg)				
Total Pesticides	NE		ND	
Metals (mg/kg)				
Barium	**489**		NE	
Copper	59.6		NE	
Lead	142		NE	
Mercury	0.34		NE	
Zinc	364		NE	

Sample ID	SB10_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**4.17**	D
Benzo(a)pyrene	**4.41**	D
Benzo(b)fluoranthene	**4.21**	D
Benzo(k)fluoranthene	**3.97**	D
Chrysene	**4.31**	D
Dibenzo(a,h)anthracene	**1.42**	D
Indeno(1,2,3-cd)pyrene	**2.46**	D
PCBs (mg/kg)		
Total PCBs	0.259	
Pesticides (mg/kg)		
Total Pesticides	ND	
Metals (mg/kg)		
Barium	**662**	
Cadmium	**7.36**	
Copper	**349**	
Lead	**750**	
Mercury	**1.11**	
Zinc	994	

LEGEND:

- APPROXIMATE SITE BOUNDARY
- SB02 — MARCH 2018 LIMITED SUBSURFACE INVESTIGATION SOIL BORING LOCATION
- SB01/TMW01 — MARCH 2018 LIMITED SUBSURFACE INVESTIGATION SOIL BORING AND TEMPORARY MONITORING WELL LOCATION

NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. SAMPLE LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
3. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO TITLE 6 OF THE NEW YORK CODES, RULES AND REGULATIONS (6 NYCRR) PART 375 UNRESTRICTED USE (UU) AND RESTRICTED USE RESTRICTED-RESIDENTIAL (RRU) SOIL CLEANUP OBJECTIVES (SCOs).
4. ONLY RESULTS ABOVE THE UU SCOs ARE SHOWN.
5. RESULTS EXCEEDING UU SCOs ARE SHADED.
6. RESULTS ABOVE RRU SCOS ARE SHADED AND BOLDED.
7. VOC = VOLATILE ORGANIC COMPOUND
8. SVOC = SEMIVOLATILE ORGANIC COMPOUND
9. PCB = POLYCHLORINATED BIPHENYL
10. ND = NOT DETECTED
11. NE = RESULTS DID NOT EXCEED THE REGULATORY COMPARISON CRITERIA.
12. ft bgs = FEET BELOW GRADE SURFACE
13. mg/kg = MILLIGRAMS PER KILOGRAM
14. D = RESULT IS FROM AN ANALYSIS THAT REQUIRED DILUTION. SEE LABORATORY REPORTS FOR FURTHER DETAILS.

Analyte	6 NYCRR PART 375 UU SCOs	6 NYCRR PART 375 RRU SCOs
VOCs (mg/kg)		
Ethyl Benzene	1	41
Xylenes, Total	0.260	100
SVOCs (mg/kg)		
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	0.800	3.9
Chrysene	1	3.9
Dibenzo(a,h)anthracene	0.330	0.330
Indeno(1,2,3-cd)pyrene	0.500	0.500
PCBs (mg/kg)		
Total PCBs	0.100	1
Pesticides (mg/kg)		
4,4'-DDD	0.00330	13.0
4,4'-DDE	0.00330	8.9
4,4'-DDT	0.00330	7.9
Dieldrin	0.00500	0.2
Metals (mg/kg)		
Barium	350	400
Cadmium	2.5	4.3
Chromium, Hexavalent	1	110
Chromium, Trivalent	30	180
Copper	50	270
Lead	63	400
Mercury	0.180	0.81
Nickel	30	310
Zinc	109	10,000

30 0 15 30
SCALE IN FEET

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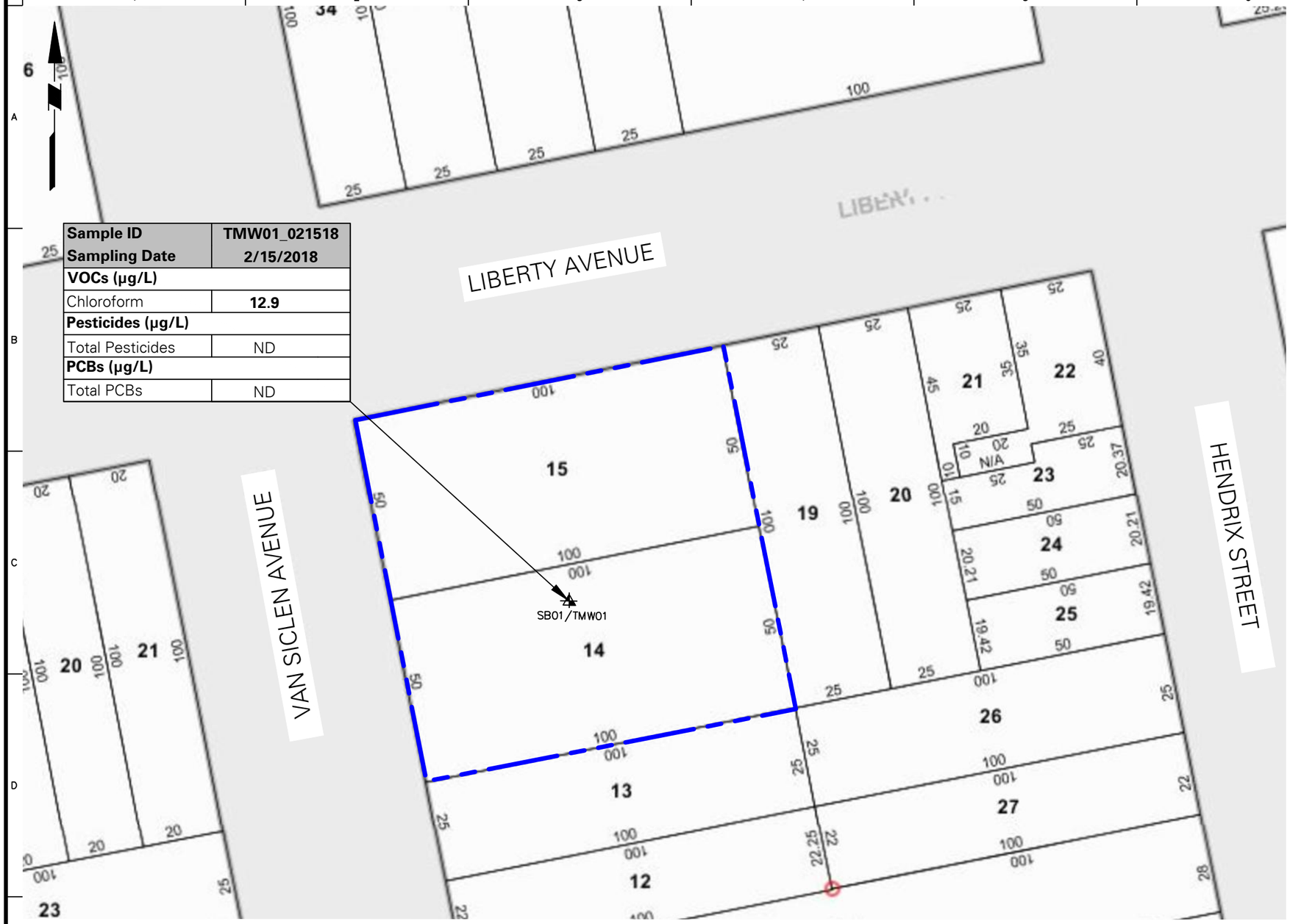
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5400 www.langan.com

Project
203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

Figure Title
SOIL SAMPLE LOCATION AND RESULTS SUMMARY MAP

Project No. 170513001	Figure No. 3
Date 03/22/2018	
Drawn By ERA	
Checked By KS	Sheet 3 of 6

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figures C-1-3- Sample Location Map - RI.dwg Date: 3/25/2019 Time: 18:57 User: knagotko Style Table: Langan.stb Layout: C-1 Soil



Sample ID	TMW01_021518
Sampling Date	2/15/2018
VOCs (µg/L)	
Chloroform	**12.9**
Pesticides (µg/L)	
Total Pesticides	ND
PCBs (µg/L)	
Total PCBs	ND

LEGEND:

APPROXIMATE SITE BOUNDARY

SB01/TMW01 MARCH 2018 LIMITED SUBSURFACE INVESTIGATION SOIL BORING AND TEMPORARY MONITORING WELL LOCATION

NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. SAMPLE LOCATION IS APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
3. GROUNDWATER SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES (SGVs) FOR CLASS GA (DRINKING WATER).
4. ONLY RESULTS ABOVE NYSDEC TOGS SGVs ARE SHOWN.
5. COMPOUNDS EXCEEDING NYSDEC TOGS SGVs ARE SHOWN IN BOLD.
6. VOC = VOLATILE ORGANIC COMPOUND
7. SVOC = SEMIVOLATILE ORGANIC COMPOUND
8. PCB = POLYCHLORINATED BIPHENYL
9. ND = NOT DETECTED
10. µg/L = MICROGRAMS PER LITER

Analyte	NYSDEC TOGS SGVs
VOCs (µg/L)	
Chloroform	7

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SCALE IN FEET

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21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001

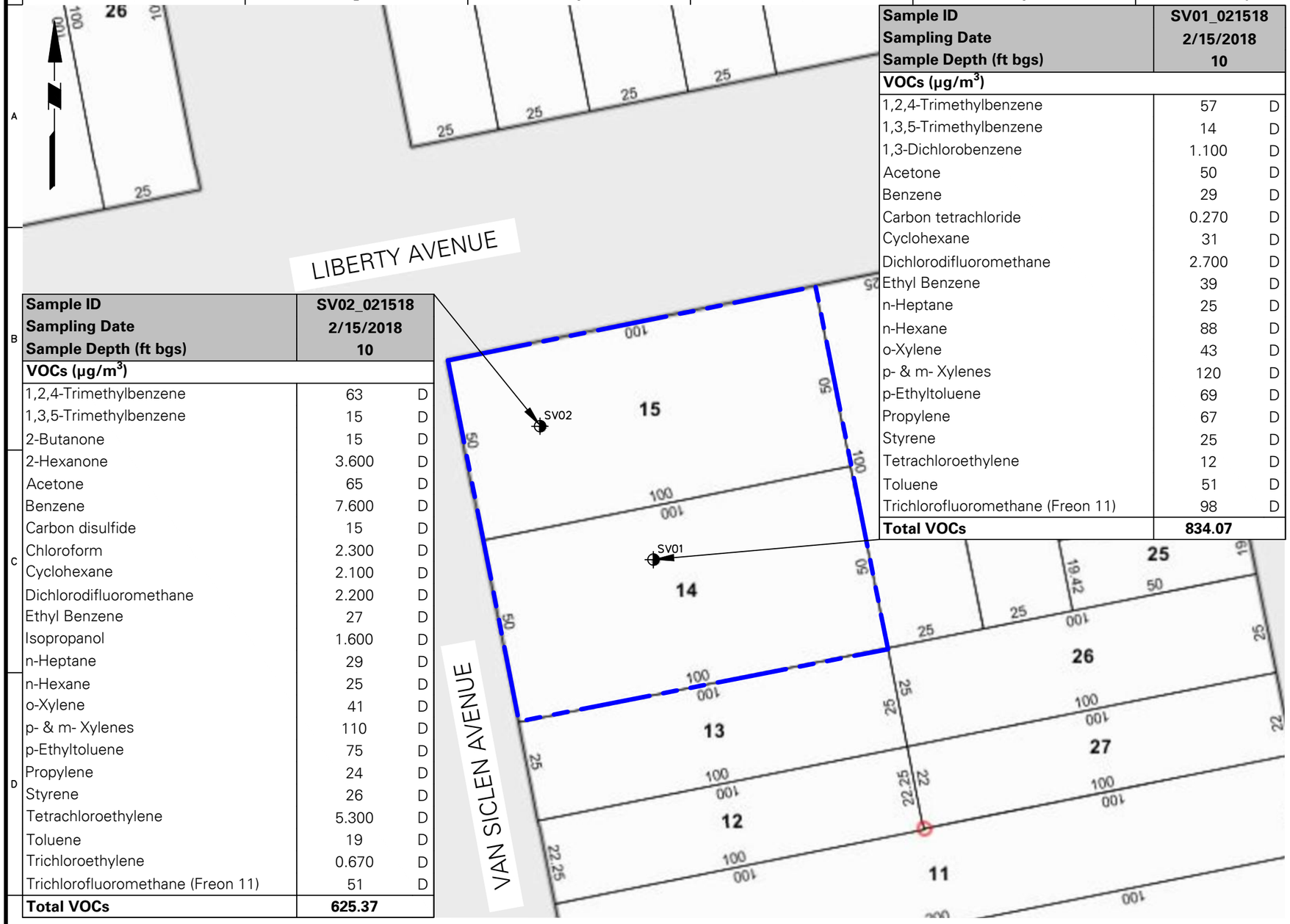
T: 212.479.5400 F: 212.479.5400 www.langan.com

Project
203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

Figure Title
GROUNDWATER SAMPLE LOCATION AND RESULTS SUMMARY MAP

Project No. 170513001	Figure No. 4
Date 03/19/2019	
Drawn By ERA	
Checked By KS	Sheet 4 of 6

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figures C-1-3- Sample Location Map - RI.dwg Date: 3/25/2019 Time: 19:00 User: knagotko Style Table: Langan.stb Layout: C-2 GW



Sample ID	SV02_021518	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	10	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	63	D
1,3,5-Trimethylbenzene	15	D
2-Butanone	15	D
2-Hexanone	3.600	D
Acetone	65	D
Benzene	7.600	D
Carbon disulfide	15	D
Chloroform	2.300	D
Cyclohexane	2.100	D
Dichlorodifluoromethane	2.200	D
Ethyl Benzene	27	D
Isopropanol	1.600	D
n-Heptane	29	D
n-Hexane	25	D
o-Xylene	41	D
p- & m- Xylenes	110	D
p-Ethyltoluene	75	D
Propylene	24	D
Styrene	26	D
Tetrachloroethylene	5.300	D
Toluene	19	D
Trichloroethylene	0.670	D
Trichlorofluoromethane (Freon 11)	51	D
Total VOCs	**625.37**	

Sample ID	SV01_021518	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	10	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	57	D
1,3,5-Trimethylbenzene	14	D
1,3-Dichlorobenzene	1.100	D
Acetone	50	D
Benzene	29	D
Carbon tetrachloride	0.270	D
Cyclohexane	31	D
Dichlorodifluoromethane	2.700	D
Ethyl Benzene	39	D
n-Heptane	25	D
n-Hexane	88	D
o-Xylene	43	D
p- & m- Xylenes	120	D
p-Ethyltoluene	69	D
Propylene	67	D
Styrene	25	D
Tetrachloroethylene	12	D
Toluene	51	D
Trichlorofluoromethane (Freon 11)	98	D
Total VOCs	**834.07**	

LEGEND:

APPROXIMATE SITE BOUNDARY

SV01 MARCH 2018 LIMITED SUBSURFACE INVESTIGATION SOIL VAPOR POINT LOCATION

NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. SAMPLE LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
3. SOIL VAPOR SAMPLE RESULTS WERE COMPARED TO THE LOWEST CONCENTRATION (ABSENT INDOOR AIR) THAT TRIGGER A MITIGATION RECOMMENDATION AS SHOWN IN THE NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH) SOIL VAPOR/INDOOR AIR MATRICES A, C, AN DC (REVISED MAY 2017).
4. ONLY DETECTED COMPOUNDS ARE SHOWN.
5. µg/m³ = MICROGRAMS PER CUBIC METER
6. VOC = VOLATILE ORGANIC COMPOUND
7. D = RESULT IS FROM AN ANALYSIS THAT REQUIRED DILUTION. SEE LABORATORY REPORT FOR FURTHER DETAILS.
10. ft bgs = FEET BELOW GRADE SURFACE

VOC	NYSDOH DECISION MATRIX VALUES
Carbon tetrachloride	6
1,1-dichloroethene	6
cis-1,2-dichloroethene	6
Tetrachloroethene	100
1,1,1-trichloroethane	100
Trichloroethene	6
Vinyl chloride	6
Methylene chloride	100

30 0 15 30
SCALE IN FEET

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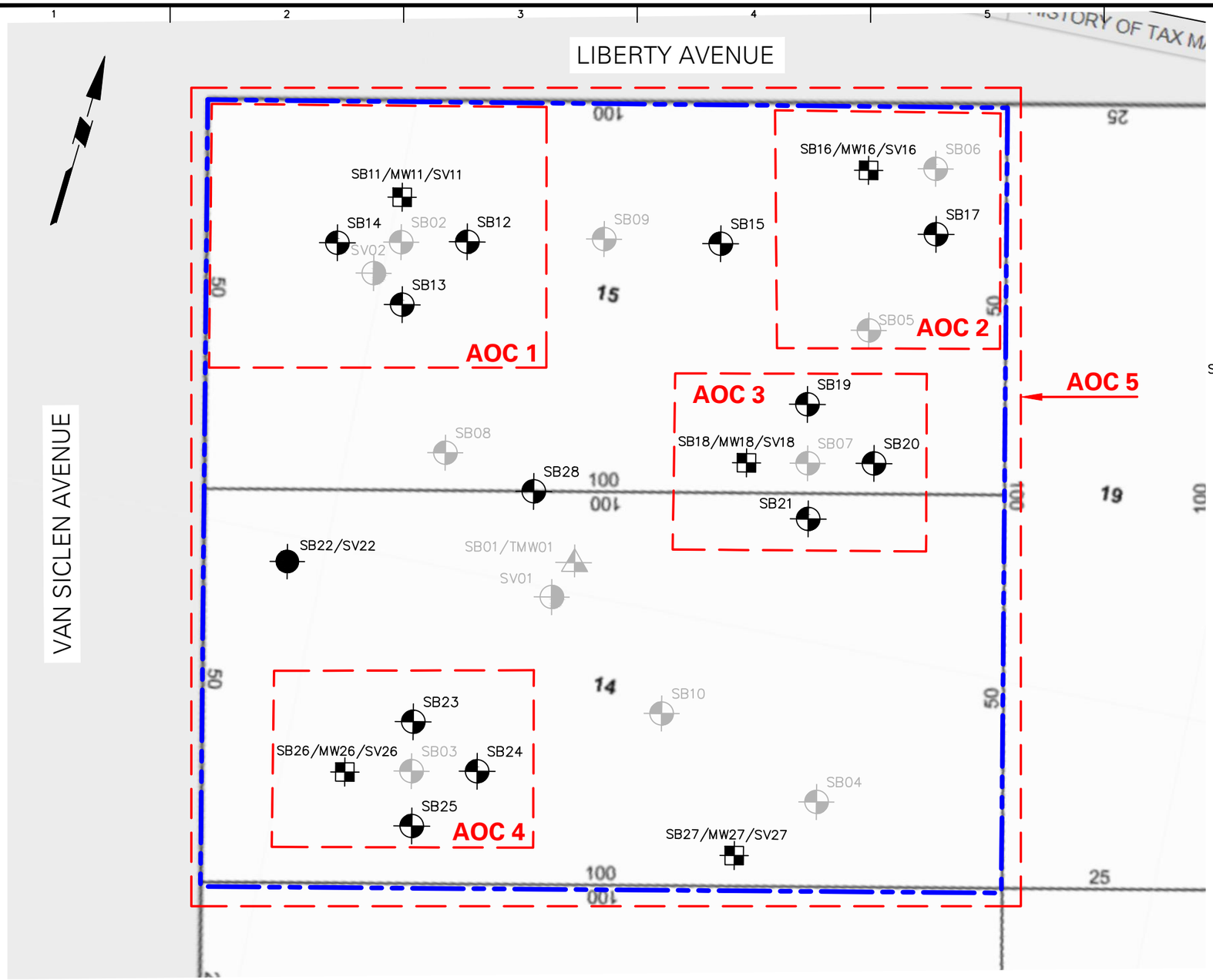
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5400 www.langan.com

Project: 203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

Figure Title: SOIL VAPOR SAMPLE LOCATION AND RESULTS SUMMARY MAP

Project No. 170513001
Date 03/19/2019
Drawn By ERA
Checked By KS
Figure No. 5
Sheet 5 of 6

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figures C-1-3- Sample Location Map - RI.dwg Date: 3/25/2019 Time: 19:01 User: knagotko Style Table: Langan.stb Layout: C-3 SV



LEGEND:

- APPROXIMATE SITE BOUNDARY
- SB02 — MARCH 2018 LIMITED SUBSURFACE INVESTIGATION SOIL BORING LOCATION
- SB01/TMW01 — MARCH 2018 LIMITED SUBSURFACE INVESTIGATION GROUNDWATER AND SOIL BORING LOCATION
- SV01 — MARCH 2018 LIMITED SUBSURFACE INVESTIGATION SOIL VAPOR LOCATION
- SB12 — PROPOSED RI BORING LOCATION
- SB16/MW16/SV16 — PROPOSED RI BORING/MONITORING WELL/ SOIL VAPOR LOCATION
- SB22/SV22 — PROPOSED RI BORING/SOIL VAPOR LOCATION
- AREA OF CONCERN

AREAS OF CONCERN:

- AOC 1 - PAH IMPACTED SOIL IN THE NORTHWEST CORNER OF THE SITE
- AOC 2 - BARIUM IMPACTED SOIL IN THE NORTHEAST CORNER OF THE SITE
- AOC 3 - BARIUM AND LEAD IMPACTED SOIL IN THE EASTERN PORTION OF THE SITE
- AOC 4 - BARIUM, LEAD AND MERCURY IMPACTED SOIL IN THE SOUTHWEST CORNER OF THE SITE
- AOC 5 - HISTORIC FILL MATERIAL AND HISTORIC SITE USES (SITE-WIDE)

NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. ALL LOCATIONS ARE APPROXIMATE
3. RI = REMEDIAL INVESTIGATION
4. AOC = AREA OF CONCERN
5. PAH = POLYCYCLIC AROMATIC HYDROCARBON

15 0 7.5 15
SCALE IN FEET

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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, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

Project
203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 & 15
BROOKLYN NEW YORK

Figure Title
PROPOSED SAMPLE LOCATION MAP

Project No. 170513001	Figure No. 6
Date 3/15/2019	
Drawn By KN	
Checked By JA	Sheet 6 of 6

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\Subsurface Investigation\Figure 6 - Proposed Sample Location Map - RI.dwg Date: 4/9/2019 Time: 20:30 User: jarmstrong Style Table: Langan.stb Layout: Sample Location Map

TABLE

Table 1
Proposed Sample Summary
Remedial Investigation Work Plan
203-207 Van Siclen Avenue
Brooklyn New York
Langan Project No. 170513001

No.	Sample Name	Location	Depth	Rationale	Analysis
SOIL SAMPLING					
Full Analysis					
1	SB15_depth	SB15	0 to 2 feet	AOC 5	Part 375/TCL VOCs via EPA Method 8260C, SVOCs via EPA Method 8270D, PCBs via EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8260C, metals (including hexavalent and trivalent chromium) via EPA Methods 6010C/7000, total cyanide via EPA Method 9010C/9014, 1,4-dioxane via EPA Method 8270 SIM, and PFCs via EPA Method 537M. *If petroleum like impacts are observed, two samples will be collected from the boring, including one from the impacted area, and one from immediately below oberserved impacts.These samples will replace the shallow and deep historic fill samples.*
2	SB15_depth		Shallow Historic Fill		
3	SB15_depth		Deep Historic Fill		
4	SB15_depth		Top of Native or Development Depth		
5	SB22_depth	SB22	0 to 2 feet		
6	SB22_depth		Shallow Historic Fill		
7	SB22_depth		Deep Historic Fill		
8	SB22_depth		Top of Native or Development Depth		
9	SB27_depth	SB27	0 to 2 feet		
10	SB27_depth		Shallow Historic Fill		
11	SB27_depth		Deep Historic Fill		
12	SB27_depth		Top of Native or Development Depth		
13	SB28_depth	SB28	0 to 2 feet		
14	SB28_depth		Shallow Historic Fill		
15	SB28_depth		Deep Historic Fill		
16	SB28_depth		Top of Native or Development Depth		
17	SBXX_depth_MS	MS/MSD	TBD	QA/QC	
18	SBXX_depth_MSD				
19	SBDUP01_date	Duplicate			
Delineation Borings					
1	SB11_0-2	SB11	0 to 2 feet	AOC 1	NYSDEC Part 375 SVOCs via EPA Method 8270D
2	SB11_2-4		2 to 4 feet		
3	SB11_4-6		4 to 6 feet		
4	SB12_0-2	SB12	0 to 2 feet		
5	SB12_2-4		2 to 4 feet		
6	SB12_4-6		4 to 6 feet		
7	SB13_0-2	SB13	0 to 2 feet		
8	SB13_2-4		2 to 4 feet		
9	SB13_4-6		4 to 6 feet		
10	SB14_0-2	SB14	0 to 2 feet		
11	SB14_2-4		2 to 4 feet		
12	SB14_4-6		4 to 6 feet		
13	SB14_X-X		Top of Native		Part 375/TCL VOCs via EPA Method 8260C, SVOCs via EPA Method 8270D, PCBs via EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8260C, metals (including hexavalent and trivalent chromium) via EPA Methods 6010C/7000, total cyanide via EPA Method 9010C/9014, 1,4-dioxane via EPA Method 8270 SIM, and PFCs via EPA Method 537M

Table 1
Proposed Sample Summary
Remedial Investigation Work Plan
203-207 Van Siclen Avenue
Brooklyn New York
Langan Project No. 170513001

No.	Sample Name	Location	Depth	Rationale	Analysis
14	SB16_0-2	SB16	0 to 2 feet	AOC 2	NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
15	SB16_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
16	SB16_4-6		4 to 6 feet		
17	SB17_0-2	SB17	0 to 2 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
18	SB17_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
19	SB17_4-6		4 to 6 feet		
20	SB17_X-X		Top of Native		Part 375/TCL VOCs via EPA Method 8260C, SVOCs via EPA Method 8270D, PCBs via EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8260C, metals (including hexavalent and trivalent chromium) via EPA Methods 6010C/7000, total cyanide via EPA Method 9010C/9014, 1,4-dioxane via EPA Method 8270 SIM, and PFCs via EPA Method 537M
21	SB18_0-2	SB18	0 to 2 feet	AOC 3	NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
22	SB18_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
23	SB18_4-6		4 to 6 feet		
24	SB19_0-2	SB19	0 to 2 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
25	SB19_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
26	SB19_4-6		4 to 6 feet		
27	SB20_0-2	SB20	0 to 2 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
28	SB20_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
29	SB20_4-6		4 to 6 feet		
30	SB21_0-2	SB21	0 to 2 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
31	SB21_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
32	SB21_4-6		4 to 6 feet		
33	SB21_X-X		Top of Native		Part 375/TCL VOCs via EPA Method 8260C, SVOCs via EPA Method 8270D, PCBs via EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8260C, metals (including hexavalent and trivalent chromium) via EPA Methods 6010C/7000, total cyanide via EPA Method 9010C/9014, 1,4-dioxane via EPA Method 8270 SIM, and PFCs via EPA Method 537M

Table 1
Proposed Sample Summary
Remedial Investigation Work Plan
203-207 Van Siclen Avenue
Brooklyn New York
Langan Project No. 170513001

No.	Sample Name	Location	Depth	Rationale	Analysis
34	SB23_0-2	SB23	0 to 2 feet	AOC 4	NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
35	SB23_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
36	SB23_4-6		4 to 6 feet		
37	SB24_0-2	SB24	0 to 2 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
38	SB24_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
39	SB24_4-6		4 to 6 feet		
40	SB25_0-2	SB25	0 to 2 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
41	SB25_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
42	SB25_4-6		4 to 6 feet		
43	SB26_0-2	SB26	0 to 2 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and TCLP Metals
44	SB26_2-4		2 to 4 feet		NYSDEC Part 375 Metals via EPA Methods 6010C/7000 and potentially TCLP Metals
45	SB26_4-6		4 to 6 feet		
85	SB26_X-X		Top of Native		Part 375/TCL VOCs, SVOCs, PCBs, pesticides, herbicides, metals (including hexavalent and trivalent chromium), total cyanide, and PFAS
86	SBXX_depth_MS	MS/MSD	TBD	QA/QC	TBD
87	SBXX_depth_MSD				
88	SBDUP02_DATE	Duplicate			
89	SBDUP03_DATE	Duplicate			
GROUNDWATER SAMPLING					
1	MW11_date	MW11	Middle of Observed Water Column	AOC 1, AOC 5	Part 375/TCL VOCs via EPA Method 8260C, SVOCs via EPA Method 8270D, PCBs via EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8260C, metals (including hexavalent and trivalent chromium) via EPA Methods 6010C/7000, total cyanide via EPA Method 9010C/9014, 1,4-dioxane via EPA Method 8270 SIM, and PFCs via EPA Method 537M
2	MW16_date	MW16		AOC 2, AOC 5	
3	MW18_date	MW18		AOC 3, AOC 5	
4	MW26_date	MW26		AOC 4, AOC 5	
5	MW27_date	MW27		AOC 5	
6	GWDUP01_date	Duplicate	TBD	QA/QC	
7	MWXX_MS_date	MS/MSD			
8	MWXX_MSD_date				

Table 1
Proposed Sample Summary
Remedial Investigation Work Plan
203-207 Van Siclen Avenue
Brooklyn New York
Langan Project No. 170513001

No.	Sample Name	Location	Depth	Rationale	Analysis
SUB-SURFACE SOIL VAPOR SAMPLING					
1	SV11_date	SV11	12-15 feet below grade surface	AOC 5, AOC 6	VOCs via EPA Method TO-15
2	SV16_date	SV16			
3	SV18_date	SV18			
4	SV22_date	SV22			
5	SV26_date	SV26			
6	SV27_date	SV27			
7	AA01_date	TBD	Ambient Air		
INVESTIGATION QA/QC					
1	FB01_date	Equipment Blank	N/A	QA/QC	Part 375/TCL VOCs via EPA Method 8260C, SVOCs via EPA Method 8270D, PCBs via EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8260C, metals (including hexavalent and trivalent chromium) via EPA Methods 6010C/7000, total cyanide via EPA Method 9010C/9014, 1,4-dioxane via EPA Method 8270 SIM, and PFCs via EPA Method 537M
2	FB02_date				
3	TB01_date	Trip Blank			TCL VOCs via EPA Method 8260C
4	TB02_date				

Notes:

1. VOC = Volatile Organic Compound
2. SVOC = Semivolatile Organic Compound
3. PCB = Polychlorinated Biphenyl
4. TBD = To be determined
5. AOC = Area of Concern
6. QA/QC = Quality Assurance/Quality Control
7. Part 375 = New York State Department of Environmental Conservation (NYSDEC) Title 6 of the New York Codes, Rules, and Regulations Part 375 List of Compounds
8. TCLP = Toxicity Characteristic Leaching Procedure
9. PFAS = per- and polyfluoroalkyl substances
10. AOC 1 = Polycyclic aromatic hydrocarbon impacted soil in northwest corner of the site
11. AOC 2 = Barium impacted soil in northeast corner of the site
12. AOC 3 = Barium and Lead impacted soil in the eastern portion of the site
13. AOC 4 = Barium, Lead and Mercury impacted soil in the southwest corner of the site
14. AOC 5 = Historic fill material and historic site use (site-wide)
15. Reporting limits for individual compounds are listed in the QAPP (Appendix C)

APPENDIX A

PREVIOUS ENVIRONMENTAL REPORTS

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

BROWNFIELD CLEANUP PROGRAM (BCP) APPLICATION FORM

DEC requires an application to request major changes to the description of the property set forth in a Brownfield Cleanup Agreement, or "*BCA*" (e.g., adding a significant amount of new property, or adding property that could affect an eligibility determination due to contamination levels or intended land use). Such application must be submitted and processed in the same manner as the original application, including the required public comment period. **Is this an application to amend an existing BCA?**

☐ **Yes** ☑ **No** **If yes, provide existing site number:** _____

PART A (note: application is separated into Parts A and B for DEC review purposes) ***BCP App Rev 10***

Section I. Requestor Information - See Instructions for Further Guidance DEC USE ONLY BCP SITE #: _____

NAME Van Siclen Realty LLC

ADDRESS 60 Lyman Place

CITY/TOWN Staten Island ZIP CODE 10304

PHONE 917-607-4967 | FAX None | E-MAIL linzerillo1@aol.com

Is the requestor authorized to conduct business in New York State (NYS)? ☑ Yes ☐ No

- If the requestor is a Corporation, LLC, LLP or other entity requiring authorization from the NYS Department of State to conduct business in NYS, the requestor's name must appear, exactly as given above, in the NYS Department of State's Corporation & Business Entity Database. A print-out of entity information from the database must be submitted to the New York State Department of Environmental Conservation (DEC) with the application to document that the requestor is authorized to do business in NYS. **Please note:** If the requestor is an LLC, the members/owners names need to be provided on a separate attachment. **See Attachment A**

Do all individuals that will be certifying documents meet the requirements detailed below? ☑ Yes ☐ No

- Individuals that will be certifying BCP documents, as well as their employers, meet the requirements of Section 1.5 of *DER-10: Technical Guidance for Site Investigation and Remediation* and Article 145 of New York State Education Law. **Documents that are not properly certified will be not approved under the BCP**.

Section II. Project Description **See Attachment B**

1. What stage is the project starting at? ☑ Investigation ☐ Remediation

   NOTE: If the project is proposed to start at the remediation stage, a Remedial Investigation Report (RIR) at a minimum is required to be attached, resulting in a 30-day public comment period. If an Alternatives Analysis and Remedial Work Plan are also attached (see DER-10 / Technical Guidance for Site Investigation and Remediation for further guidance) then a 45-day public comment period is required.

2. If a final RIR is included, please verify it meets the requirements of Environmental Conservation Law (ECL) Article 27-1415(2): ☐ Yes ☐ No **N/A**

3. Please attach a short description of the overall development project, including:

   - the date that the remedial program is to start; and
   - the date the Certificate of Completion is anticipated.

Section III. Property's Environmental History

See Attachment C, including CD

All applications **must include** an Investigation Report (per ECL 27-1407(1)). The report must be sufficient to establish contamination of environmental media on the site above applicable Standards, Criteria and Guidance (SCGs) based on the reasonably anticipated use of the property.

To the extent that existing information/studies/reports are available to the requestor, please attach the following (***please submit the information requested in this section in electronic format only***):

1. **Reports:** an example of an Investigation Report is a Phase II Environmental Site Assessment report prepared in accordance with the latest American Society for Testing and Materials standard (ASTM E1903). **Please submit a separate electronic copy of each report in Portable Document Format (PDF).**

2. SAMPLING DATA: INDICATE KNOWN CONTAMINANTS AND THE MEDIA WHICH ARE KNOWN TO HAVE BEEN AFFECTED. LABORATORY REPORTS SHOULD BE REFERENCED AND COPIES INCLUDED.

Contaminant Category	Soil	Groundwater	Soil Gas
Petroleum			
Chlorinated Solvents			
Other VOCs	X	X	X
SVOCs	X		
Metals	X		
Pesticides	X		
PCBs	X		
Other*			

***Please describe:** _____

3. FOR EACH IMPACTED MEDIUM INDICATED ABOVE, INCLUDE A SITE DRAWING INDICATING:

- **SAMPLE LOCATION**
- **DATE OF SAMPLING EVENT**
- **KEY CONTAMINANTS AND CONCENTRATION DETECTED**
- **FOR SOIL, HIGHLIGHT IF ABOVE REASONABLY ANTICIPATED USE**
- **FOR GROUNDWATER, HIGHLIGHT EXCEEDANCES OF 6NYCRR PART 703.5**
- **FOR SOIL GAS/ SOIL VAPOR/ INDOOR AIR, HIGHLIGHT IF ABOVE MITIGATE LEVELS ON THE NEW YORK STATE DEPARTMENT OF HEALTH MATRIX**

THESE DRAWINGS ARE TO BE REPRESENTATIVE OF ALL DATA BEING RELIED UPON TO MAKE THE CASE THAT THE SITE IS IN NEED OF REMEDIATION UNDER THE BCP. DRAWINGS SHOULD NOT BE BIGGER THAN 11" X 17". THESE DRAWINGS SHOULD BE PREPARED IN ACCORDANCE WITH ANY GUIDANCE PROVIDED.

ARE THE REQUIRED MAPS INCLUDED WITH THE APPLICATION?* ☑ **Yes** ☐ **No**
(*answering No will result in an incomplete application)

4. INDICATE PAST LAND USES (CHECK ALL THAT APPLY):

☐ Coal Gas Manufacturing	☐ Manufacturing	☐ Agricultural Co-op	☐ Dry Cleaner
☑ Salvage Yard	☐ Bulk Plant	☐ Pipeline	☐ Service Station
☐ Landfill	☐ Tannery	☐ Electroplating	☐ Unknown

Other: Illegal "Chop Shop"

Section IV. Property Information - See Instructions for Further Guidance See Attachment D

PROPOSED SITE NAME 203-207 Van Siclen Avenue

ADDRESS/LOCATION 203-207 Van Siclen Avenue

CITY/TOWN Brooklyn ZIP CODE 11207

MUNICIPALITY(IF MORE THAN ONE, LIST ALL):
Brooklyn

COUNTY Kings SITE SIZE (ACRES) 0.23

LATITUDE (degrees/minutes/seconds)	LONGITUDE (degrees/minutes/seconds)
40 ° 40 ‘ 30.2 “	73 ° 53 ‘ 26.3 “

Complete tax map information for all tax parcels included within the proposed site boundary. If a portion of any lot is proposed , please indicate as such by inserting “P/O” in front of the lot number in the appropriate box below, and only include the acreage for that portion of the tax parcel in the corresponding far right column.ATTACH REQUIRED MAPS PER THE APPLICATION INSTRUCTIONS.

Parcel Address	Section No.	Block No.	Lot No.	Acreage
203 Van Siclen Avenue		3978	14	0.115
207 Van Siclen Avenue		3978	15	0.115

1. Do the proposed site boundaries correspond to tax map metes and bounds? ☑ Yes ☐ No
   If no, please attach an accurate map of the propsed site.

2. Is the required property map attached to the application? ☑ Yes ☐ No
   (application will not be processed without map)

3. Is the property within a designated Environmental Zone (En-zone) pursuant to Tax Law 21(b)(6)?
   (See DEC's website for more information) Yes ☑ No ☐

   If yes, identify census tract : Census Tract 1152

   Percentage of property in En-zone (check one): ☐ 0-49% ☐ 50-99% ☑ 100%

4. Is this application one of multiple applications for a large development project, where the development project spans more than 25 acres (see additional criteria in BCP application instructions)? ☐ Yes ☑ No

   If yes, identify name of properties (and site numbers if available) in related BCP applications:_____

5. Is the contamination from groundwater or soil vapor solely emanating from property other than the site subject to the present application? ☐ Yes ☑ No

6. Has the property previously been remediated pursuant to Titles 9, 13, or 14 of ECL Article 27, Title 5 of ECL Article 56, or Article 12 of Navigation Law? ☐ Yes ☑ No
   If yes, attach relevant supporting documentation.

7. Are there any lands under water? ☐ Yes ☑ No
   If yes, these lands should be clearly delineated on the site map.

Section IV. Property Information (continued) **See Attachment D**

8. Are there any easements or existing rights of way that would preclude remediation in these areas? If yes, identify here and attach appropriate information. ☐ Yes ☑ No

Easement/Right-of-way Holder	Description
No Easements Exist	

9. List of Permits issued by the DEC or USEPA Relating to the Proposed Site (type here or attach information)

Type	Issuing Agency	Description
No Permits Exist		

10. Property Description and Environmental Assessment – **please refer to application instructions for the proper format of <u>each</u> narrative requested.**

Are the Property Description and Environmental Assessment narratives included in the **prescribed format**? ☑ Yes ☐ No

Note: Questions 11 through 13 only pertain to sites located within the five counties comprising New York City

11. Is the requestor seeking a determination that the site is eligible for tangible property tax credits? ☑ Yes ☐ No
If yes, requestor must answer questions on the supplement at the end of this form.

12. Is the Requestor now, or will the Requestor in the future, seek a determination that the property is Upside Down? ☐ Yes ☑ No

13. If you have answered *Yes* to Question 12, above, is an independent appraisal of the value of the property, as of the date of application, prepared under the hypothetical condition that the property is not contaminated, included with the application? ☐ Yes ☑ No

NOTE: If a tangible property tax credit determination is not being requested in the application to participate in the BCP, the applicant may seek this determination at any time before issuance of a certificate of completion by using the BCP Amendment Application, <u>except</u> for sites seeking eligibility under the underutilized category.

If any changes to Section IV are required prior to application approval, a new page, initialed by each requestor, must be submitted.

Initials of each Requestor: _____ _____ _____ _____ _____ _____

BCP application - PART B (note: application is separated into Parts A and B for DEC review purposes)

Section V. Additional Requestor Information See Instructions for Further Guidance	DEC USE ONLY BCP SITE NAME: _____ BCP SITE #:_____	
NAME OF REQUESTOR'S AUTHORIZED REPRESENTATIVE Lisa Inzerillo		
ADDRESS 60 Lyman Place		
CITY/TOWN Staten Island		ZIP CODE 10304
PHONE 917-607-4967	FAX None	E-MAIL linzerillo1@aol.com
NAME OF REQUESTOR'S CONSULTANT Michael Burke of Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.		
ADDRESS 21 Penn Plaza, 360 West 31st Street, 8th Floor		
CITY/TOWN New York		ZIP CODE 10001
PHONE (212) 421-2150	FAX (212) 479-5444	E-MAIL mburke@langan.com
NAME OF REQUESTOR'S ATTORNEY David Yudelson, SIVE PAGET & RIESEL, P.C.		
ADDRESS 560 Lexington Avenue, 15th Floor		
CITY/TOWN New York, NY		ZIP CODE 10022
PHONE 646-378-7219	FAX 212-421-1891	E-MAIL dyudelson@sprlaw.com

Section VI. Current Property Owner/Operator Information – if not a Requestor **See Attachment E**		
CURRENT OWNER'S NAME Van Siclen Realty LLC		OWNERSHIP START DATE: 05/03/2017
ADDRESS 60 Lyman Place		
CITY/TOWN Staten Island		ZIP CODE 10306
PHONE 347-861-7388	FAX None	E-MAIL linzerillo1@aol.com
CURRENT OPERATOR'S NAME Lisa Inzerillo		
ADDRESS 60 Lyman Place		
CITY/TOWN Staten Island		ZIP CODE 10306
PHONE 917-607-4967	FAX None	E-MAIL linzerillo1@aol.com

PROVIDE A LIST OF PREVIOUS PROPERTY OWNERS AND OPERATORS WITH NAMES, LAST KNOWN ADDRESSES AND TELEPHONE NUMBERS AS AN ATTACHMENT. DESCRIBE REQUESTOR'S RELATIONSHIP, TO EACH PREVIOUS OWNER AND OPERATOR, INCLUDING ANY RELATIONSHIP BETWEEN REQUESTOR'S CORPORATE MEMBERS AND PREVIOUS OWNER AND OPERATOR. IF NO RELATIONSHIP, PUT "NONE".

IF REQUESTOR IS NOT THE CURRENT OWNER, DESCRIBE REQUESTOR'S RELATIONSHIP TO THE CURRENT OWNER, INCLUDING ANY RELATIONSHIP BETWEEN REQUESTOR'S CORPORATE MEMBERS AND THE CURRENT OWNER.

Section VII. Requestor Eligibility Information (Please refer to ECL § 27-1407)

If answering "yes" to any of the following questions, please provide an explanation as an attachment.

1. Are any enforcement actions pending against the requestor regarding this site? ☐ Yes ☑ No
2. Is the requestor subject to an existing order for the investigation, removal or remediation of contamination at the site? ☐ Yes ☑ No
3. Is the requestor subject to an outstanding claim by the Spill Fund for this site? Any questions regarding whether a party is subject to a spill claim should be discussed with the Spill Fund Administrator. ☐ Yes ☑ No

Section VII. Requestor Eligibility Information (continued)

4. Has the requestor been determined in an administrative, civil or criminal proceeding to be in violation of i) any provision of the ECL Article 27; ii) any order or determination; iii) any regulation implementing Title 14; or iv) any similar statute, regulation of the state or federal government? If so, provide an explanation on a separate attachment. ☐ Yes ☑ No
5. Has the requestor previously been denied entry to the BCP? If so, include information relative to the application, such as name, address, DEC assigned site number, the reason for denial, and other relevant information. ☐ Yes ☑ No
6. Has the requestor been found in a civil proceeding to have committed a negligent or intentionally tortious act involving the handling, storing, treating, disposing or transporting of contaminants? ☐ Yes ☑ No
7. Has the requestor been convicted of a criminal offense i) involving the handling, storing, treating, disposing or transporting of contaminants; or ii) that involves a violent felony, fraud, bribery, perjury, theft, or offense against public administration (as that term is used in Article 195 of the Penal Law) under federal law or the laws of any state? ☐ Yes ☑ No
8. Has the requestor knowingly falsified statements or concealed material facts in any matter within the jurisdiction of DEC, or submitted a false statement or made use of or made a false statement in connection with any document or application submitted to DEC? ☐ Yes ☑ No
9. Is the requestor an individual or entity of the type set forth in ECL 27-1407.9 (f) that committed an act or failed to act, and such act or failure to act could be the basis for denial of a BCP application? ☐ Yes ☑ No
10. Was the requestor's participation in any remedial program under DEC's oversight terminated by DEC or by a court for failure to substantially comply with an agreement or order? ☐ Yes ☑ No
11. Are there any unregistered bulk storage tanks on-site which require registration? ☐ Yes ☑ No

THE REQUESTOR MUST CERTIFY THAT HE/SHE IS EITHER A PARTICIPANT OR VOLUNTEER IN ACCORDANCE WITH ECL 27-1405 (1) BY CHECKING ONE OF THE BOXES BELOW:

☐ PARTICIPANT

A requestor who either 1) was the owner of the site at the time of the disposal of hazardous waste or discharge of petroleum or 2) is otherwise a person responsible for the contamination, unless the liability arises solely as a result of ownership, operation of, or involvement with the site subsequent to the disposal of hazardous waste or discharge of petroleum.

☑ VOLUNTEER

A requestor other than a participant, including a requestor whose liability arises solely as a result of ownership, operation of or involvement with the site subsequent to the disposal of hazardous waste or discharge of petroleum.

NOTE: By checking this box, a requestor whose liability arises solely as a result of ownership, operation of or involvement with the site certifies that he/she has exercised appropriate care with respect to the hazardous waste found at the facility by taking reasonable steps to: i) stop any continuing discharge; ii) prevent any threatened future release; iii) prevent or limit human, environmental, or natural resource exposure to any previously released hazardous waste.

If a requestor whose liability arises solely as a result of ownership, operation of or involvement with the site, submit a statement describing why you should be considered a volunteer – be specific as to the appropriate care taken.

The requester should be considered a Volunteer as they purchased the site in May 2017, after the site had been impacted by prior uses, a closed spill case, and/or placement of historic fill material. Since purchasing, previous tenants have vacated and the current tenant uses the site for equipment storage, but not for maintenance or a scrap yard.

Section VII. Requestor Eligibility Information (continued)

Requestor Relationship to Property (check one):
☐ Previous Owner ☑ Current Owner ☐ Potential /Future Purchaser ☐ Other_____

If requestor is not the current site owner, **proof of site access sufficient to complete the remediation must be submitted**. Proof must show that the requestor will have access to the property before signing the BCA and throughout the BCP project, including the ability to place an easement on the site Is this proof attached?

☐ Yes ☐ No **N/A**

Note: a purchase contract does not suffice as proof of access.

Section VIII. Property Eligibility Information - See Instructions for Further Guidance

1. Is / was the property, or any portion of the property, listed on the National Priorities List?
   If yes, please provide relevant information as an attachment. ☐ Yes ☑ No
2. Is / was the property, or any portion of the property, listed on the NYS Registry of Inactive Hazardous Waste Disposal Sites pursuant to ECL 27-1305? ☐ Yes ☑ No
   If yes, please provide: Site #_____ Class # _____
3. Is / was the property subject to a permit under ECL Article 27, Title 9, other than an Interim Status facility? ☐ Yes ☑ No
   If yes, please provide: Permit type:_____ EPA ID Number:_____
   Date permit issued:_____ Permit expiration date:_____
4. If the answer to question 2 or 3 above is yes, is the site owned by a volunteer as defined under ECL 27-1405(1)(b), or under contract to be transferred to a volunteer? Attach any information available to the requestor related to previous owners or operators of the facility or property and their financial viability, including any bankruptcy filing and corporate dissolution documentation. **N/A** ☐ Yes ☐ No
5. Is the property subject to a cleanup order under Navigation Law Article 12 or ECL Article 17 Title 10?
   If yes, please provide: Order #_____ ☐ Yes ☑ No
6. Is the property subject to a state or federal enforcement action related to hazardous waste or petroleum?
   If yes, please provide explanation as an attachment. ☐ Yes ☑ No

Section IX. Contact List Information **See Attachment F**

To be considered complete, the application must include the Brownfield Site Contact List in accordance with *DER-23 / Citizen Participation Handbook for Remedial Programs*. Please attach, at a minimum, the names and addresses of the following:

1. The chief executive officer and planning board chairperson of each county, city, town and village in which the property is located.
2. Residents, owners, and occupants of the property and properties adjacent to the property.
3. Local news media from which the community typically obtains information.
4. The public water supplier which services the area in which the property is located.
5. Any person who has requested to be placed on the contact list.
6. The administrator of any school or day care facility located on or near the property.
7. The location of a document repository for the project (e.g., local library). **If the site is located in a city with a population of one million or more, add the appropriate community board as an additional document repository**. In addition, attach a copy of an acknowledgement from each repository indicating that it agrees to act as the document repository for the site.

Section X. Land Use Factors

See Attachment G

1. What is the current municipal zoning designation for the site? _____

   What uses are allowed by the current zoning? (Check boxes, below)

   ☑ Residential ☑ Commercial ☑ Industrial

   If zoning change is imminent, please provide documentation from the appropriate zoning authority.

2. Current Use: ☐ Residential ☐ Commercial ☑ Industrial ☑ Vacant ☐ Recreational (check all that apply)

   Attach a summary of current business operations or uses, with an emphasis on identifying possible contaminant source areas. If operations or uses have ceased, provide the date.

3. Reasonably anticipated use Post Remediation: ☑ Residential ☐ Commercial ☐ Industrial (check all that apply) **Attach a statement detailing the specific proposed use.**

   If residential, does it qualify as single family housing? ☐ Yes ☑ No

4. Do current historical and/or recent development patterns support the proposed use?	☑ Yes ☐ No
5. Is the proposed use consistent with applicable zoning laws/maps? Briefly explain below, or attach additional information and documentation if necessary. Included in Attachment G.	☑ Yes ☐ No
6. Is the proposed use consistent with applicable comprehensive community master plans, local waterfront revitalization plans, or other adopted land use plans? Briefly explain below, or attach additional information and documentation if necessary. Included in Attachment G.	☑ Yes ☐ No

XI. Statement of Certification and Signatures

(By requestor who is an individual)

If this application is approved, I hereby acknowledge and agree: (1) to execute a Brownfield Cleanup Agreement (BCA) within 60 days of the date of DEC's approval letter; (2) to the general terms and conditions set forth in the *DER-32, Brownfield Cleanup Program Applications and Agreements*; and (3) that in the event of a conflict between the general terms and conditions of participation and the terms contained in a site-specific BCA, the terms in the site-specific BCA shall control. Further, I hereby affirm that information provided on this form and its attachments is true and complete to the best of my knowledge and belief. I am aware that any false statement made herein is punishable as a Class A misdemeanor pursuant to section 210.45 of the Penal Law.

Date: _____ Signature: Lisa Inzerillo

Print Name: Lisa Inzerillo

(By a requestor other than an individual)

I hereby affirm that I am Representative (title) of Van Sicklen Realty LLC (entity); that I am authorized by that entity to make this application and execute the Brownfield Cleanup Agreement (BCA) and all subsequent amendments; that this application was prepared by me or under my supervision and direction. If this application is approved, I acknowledge and agree: (1) to execute a BCA within 60 days of the date of DEC's approval letter; (2) to the general terms and conditions set forth in the *DER-32, Brownfield Cleanup Program Applications and Agreements*; and (3) that in the event of a conflict between the general terms and conditions of participation and the terms contained in a site-specific BCA, the terms in the site-specific BCA shall control. Further, I hereby affirm that information provided on this form and its attachments is true and complete to the best of my knowledge and belief. I am aware that any false statement made herein is punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Date: 9/26/2018 Signature: Lisa Inzerillo

Print Name: Lisa Inzerillo

SUBMITTAL INFORMATION:

- **Two (2)** copies, one paper copy with original signatures and one electronic copy in Portable Document Format (PDF), must be sent to:
  - Chief, Site Control Section
  - New York State Department of Environmental Conservation
  - Division of Environmental Remediation
  - 625 Broadway
  - Albany, NY 12233-7020

FOR DEC USE ONLY
BCP SITE T&A CODE: _____ **LEAD OFFICE:** _____

Supplemental Questions for Sites Seeking Tangible Property Credits in New York City ONLY. Sufficient information to demonstrate that the site meets one or more of the criteria identified in ECL 27 1407(1-a) must be submitted if requestor is seeking this determination.

BCP App Rev 10

Property is in Bronx, Kings, New York, Queens, or Richmond counties.	☑ Yes ☐ No
Requestor seeks a determination that the site is eligible for the tangible property credit component of the brownfield redevelopment tax credit.	☑ Yes ☐ No
Please answer questions below and provide documentation necessary to support answers.	
1. Is at least 50% of the site area located within an environmental zone pursuant to NYS Tax Law 21(b)(6)? Please see DEC's website for more information.	☑ Yes ☐ No
2. Is the property upside down or underutilized as defined below? Upside Down?	☐ Yes ☑ No
Underutilized?	☐ Yes ☑ No

From ECL 27-1405(31):

"Upside down" shall mean a property where the projected and incurred cost of the investigation and remediation which is protective for the anticipated use of the property equals or exceeds seventy-five percent of its independent appraised value, as of the date of submission of the application for participation in the brownfield cleanup program, developed under the hypothetical condition that the property is not contaminated.

From 6 NYCRR 375-3.2(l) as of August 12, 2016: (Please note: Eligibility determination for the underutilized category can only be made at the time of application)

375-3.2:

(l) "Underutilized" means, as of the date of application, real property on which no more than fifty percent of the permissible floor area of the building or buildings is certified by the applicant to have been used under the applicable base zoning for at least three years prior to the application, which zoning has been in effect for at least three years; and

(1) the proposed use is at least 75 percent for industrial uses; or

(2) at which:

(i) the proposed use is at least 75 percent for commercial or commercial and industrial uses;

(ii) the proposed development could not take place without substantial government assistance, as certified by the municipality in which the site is located; and

(iii) one or more of the following conditions exists, as certified by the applicant:

(a) property tax payments have been in arrears for at least five years immediately prior to the application;

(b) a building is presently condemned, or presently exhibits documented structural deficiencies, as certified by a professional engineer, which present a public health or safety hazard; or

(c) there are no structures.

"Substantial government assistance" shall mean a substantial loan, grant, land purchase subsidy, land purchase cost exemption or waiver, or tax credit, or some combination thereof, from a governmental entity.

The property is located within an En Zone and will include an affordable housing component; therefore, it is anticipated that it will be eligible for tangible property credits. The En Zone that includes the site is shown on Figure D-5 in Attachment D.

Supplemental Questions for Sites Seeking Tangible Property Credits in New York City (continued)

3. If you are seeking a formal determination as to whether your project is eligible for Tangible Property Tax Credits based in whole or in part on its status as an affordable housing project (defined below), you must attach the regulatory agreement with the appropriate housing agency (typically, these would be with the *New York City Department of Housing, Preservation and Development*; *the New York State Housing Trust Fund Corporation*; the *New York State Department of Housing and Community Renewal*; or the *New York State Housing Finance Agency*, though other entities may be acceptable pending Department review). **Check appropriate box, below**:

☐ Project is an Affordable Housing Project - Regulatory Agreement Attached;

☑ Project is Planned as Affordable Housing, But Agreement is Not Yet Available* (*Checking this box will result in a "pending" status. The Regulatory Agreement will need to be provided to the Department and the Brownfield Cleanup Agreement will need to be amended prior to issuance of the CoC in order for a positive determination to be made.);

☐ This is Not an Affordable Housing Project.

From 6 NYCRR 375- 3.2(a) as of August 12, 2016:

(a) "Affordable housing project" means, for purposes of this part, title fourteen of article twenty seven of the environmental conservation law and section twenty-one of the tax law only, a project that is developed for residential use or mixed residential use that must include affordable residential rental units and/or affordable home ownership units.

(1) Affordable residential rental projects under this subdivision must be subject to a federal, state, or local government housing agency's affordable housing program, or a local government's regulatory agreement or legally binding restriction, which defines (i) a percentage of the residential rental units in the affordable housing project to be dedicated to (ii) tenants at a defined maximum percentage of the area median income based on the occupants' households annual gross income.

(2) Affordable home ownership projects under this subdivision must be subject to a federal, state, or local government housing agency's affordable housing program, or a local government's regulatory agreement or legally binding restriction, which sets affordable units aside for home owners at a defined maximum percentage of the area median income.

(3) "Area median income" means, for purposes of this subdivision, the area median income for the primary metropolitan statistical area, or for the county if located outside a metropolitan statistical area, as determined by the United States department of housing and urban development, or its successor, for a family of four, as adjusted for family size.

BCP Application Summary (for DEC use only)

Site Name: 203-207 Van Siclen Avenue **Site Address:** 203-207 Van Siclen Avenue
City: Brooklyn **County:** Kings **Zip:** 11207

Tax Block & Lot
Section (if applicable): **Block:** 3978 **Lot:** 14

Requestor Name: Van Siclen Realty LLC **Requestor Address:** 60 Lyman Place
City: Staten Island **Zip:** 10304 **Email:** linzerillo1@aol.com

Requestor's Representative (for billing purposes)
Name: Lisa Inzerillo **Address:** 60 Lyman Place
City: Staten Island **Zip:** 10304 **Email:** linzerillo1@aol.com

Requestor's Attorney
Name: David Yudelson, SIVE PAGET & RIESEL, P.C. **Address:** 560 Lexington Avenue, 15th Floor
City: New York, NY **Zip:** 10022 **Email:** dyudelson@sprlaw.com

Requestor's Consultant
Name: Michael Burke of Langan Engineering, Environmental, Surveying and Landscape Arc **Address:** 21 Penn Plaza, 360 West 31st Street, 8th Floor
City: New York **Zip:** 10001 **Email:** mburke@langan.com

Percentage claimed within an En-Zone: ☐ **0%** ☐ **<50%** ☐ **50-99%** ☑ **100%**

DER Determination: ☐ Agree ☐ Disagree

Requestor's Requested Status: ☑ **Volunteer** ☐ **Participant**

DER/OGC Determination: ☐ Agree ☐ Disagree
Notes:

For NYC Sites, is the Requestor Seeking Tangible Property Credits: ☑ Yes ☐ No

Does Requestor Claim Property is Upside Down: ☐ Yes ☑ No

DER/OGC Determination: ☐ Agree ☐ Disagree ☐ Undetermined

Notes:

Does Requestor Claim Property is Underutilized: ☐ Yes ☑ No

DER/OGC Determination: ☐ Agree ☐ Disagree ☐ Undetermined

Notes:

Does Requestor Claim Affordable Housing Status: ☐ Yes ☐ No ☑ Planned, No Contract

DER/OGC Determination: ☐ Agree ☐ Disagree ☐ Undetermined

Notes:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

BROWNFIELD CLEANUP PROGRAM (BCP)
INSTRUCTIONS FOR COMPLETING A BCP APPLICATION

The New York State Department of Environmental Conservation (DEC) strongly encourages all applicants to schedule a pre-application meeting with DEC staff to review the benefits, requirements, and procedures for completing a project in the BCP. Contact your Regional office to schedule a meeting. To add a party to an existing BCP Agreement and/or Application, use the BCP Agreement Amendment Application. **See guidance at the end of these instructions regarding the determination of a complete application.**

SECTION I REQUESTOR INFORMATION

Requestor Name

Provide the name of the person(s)/entity requesting participation in the BCP. (If more than one, attach additional sheets with requested information. If an LLC, the members/owners names need to be provided on a separate attachment). The requestor is the person or entity seeking DEC review and approval of the remedial program.

If the requestor is a Corporation, LLC, LLP or other entity requiring authorization from the NYS Department of State to conduct business in NYS, the requestor's name must appear exactly as given in the NYS Department of State's Corporation & Business Entity Database. A print-out of entity information from the database must be submitted to DEC with the application, to document that the requestor is authorized to do business in NYS.

Address, etc.

Provide the requestor's mailing address, telephone number; fax number and e-mail address.

Document Certification

All documents, which are prepared in final form for submission to DEC for approval, are to be prepared and certified in accordance with Section 1.5 of DER-10. Persons preparing and certifying the various work plans and reports identified in Section 1.5 include:

- New York State licensed professional engineers (PEs), as defined at 6 NYCRR 375-1.2(aj) and paragraph 1.3(b)47. Engineering documents must be certified by a PE with current license and registration for work that was done by them or those under their direct supervision. The firm by which the PE is employed must also be authorized to practice engineering in New York State;
- qualified environmental professionals as defined at 6 NYCRR 375-1.2(ak) and DER-10 paragraph 1.3(b)49;
- remedial parties, as defined at 6 NYCRR 375-1.2(ao) and DER-10 paragraph 1.3(b)60; or
- site owners, which are the owners of the property comprising the site at the time of the certification.

SECTION II PROJECT DESCRIPTION

As a separate attachment, provide complete and detailed information about the project, including the purpose of the project, the date the remedial program is to start, and the date the Certificate of Completion is anticipated..

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SECTION III PROPERTY'S ENVIRONMENTAL HISTORY

Please follow instructions on application form.

SECTION IV PROPERTY INFORMATION

Proposed Site Name

Provide a name for the proposed site. The name could be an owner's name, current or historical operations (i.e. ABC Furniture) or the general location of the property. Consider whether the property is known by DEC by a particular name, and if so, use that name.

Site Address

Provide a street address, city/town, zip code, and each municipality and county in which the site is located. .

Site Size

Provide the approximate acreage of the site.

GIS Information

Provide the latitude and longitude for the approximate center of the property. Show the latitude and longitude in degrees, minutes and seconds.

Tax Parcel Information

Provide the tax parcel address/section/block/lot information and map. Tax map information may be obtained from the tax assessor's office for all tax parcels that are included in the property boundaries. Attach a county tax map with identifier numbers, along with any figures needed to show the location and boundaries of the property. Include a USGS 7.5 minute quad map on which the property appears and clearly indicate the proposed site's location.

1. Tax Map Boundaries

State whether the boundaries of the site correspond to the tax map boundaries. If no, a metes and bounds description of the property must be attached. The site boundary can occupy less than a tax lot or encompass portions of one or more tax lots and may be larger or smaller than the overall redevelopment/ reuse project area. A site survey with metes and bounds will be required to establish the site boundaries before the Certificate of Completion can be issued.

2. Map

Provide a property base map(s) of sufficient detail, clarity and accuracy to show the following: i*)* map scale, north arrow orientation, date, and location of the property with respect to adjacent streets and roadways; and ii*)* proposed brownfield property boundary lines, with adjacent property owners clearly identified.

SECTION IV (continued)

3. En-zone

Is any part of the property in an En-zone? If so, what percentage? For information on En-zones, please see DEC's website.

4. Multiple applications

Generally, only one application can be submitted, and one BCA executed, for a development project. In limited circumstances, the DEC may consider multiple applications/BCAs for a development project where 1) the development project spans more than 25 acres; 2) the approach does not negatively impact the remedial program, including timing, ability to appropriately address areas of concern, and management of off-site concerns; and 3) the approach is not advanced to increase the value of future tax credits (i.e., circumvent the tax credit caps provided under New York State Tax Law Section 21).

10. Property Description Narrative

Provide a property description in the format provided below. Each section should be no more than one paragraph long.

Location

Example: "The XYZ Site is located in an {urban, suburban, rural} area." {Add reference points if address is unspecific; e.g., "The site is approximately 3.5 miles east of the intersection of County Route 55 and Industrial Road."}

Site Features:

Example: "The main site features include several large abandoned buildings surrounded by former parking areas and roadways. About one quarter of the site area is wooded. Little Creek passes through the northwest corner."

Current Zoning and Land Use: (Ensure the current zoning is identified.)

Example: "The site is currently inactive, and is zoned for commercial use. The surrounding parcels are currently used for a combination of commercial, light industrial, and utility right-of-ways. The nearest residential area is 0.3 miles east on Route 55."

Past Use of the Site: include source(s) of contamination and remedial measures (site characterizations, investigations, Interim Remedial Measures, etc.) completed outside of the current remedial program (e.g., work under a petroleum spill incident).

Example: "Until 1992 the site was used for manufacturing wire and wire products (e.g., conduit, insulators) and warehousing. Prior uses that appear to have led to site contamination include metal plating, machining, disposal in a one-acre landfill north of Building 7, and releases of wastewater into a series of dry wells."

When describing the investigations/actions performed outside of the remedial program, include the major chronological remedial events that lead to the site entering a remedial program. The history should include the first involvement by government to address hazardous waste/petroleum disposal. Do not cite reports. Only include remedial activities which were implemented PRIOR to the BCA. Do not describe sampling information.

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SECTION IV (continued)

Property Description Narrative (continued)

Site Geology and Hydrogeology:

As appropriate, provide a very brief summary of the main hydrogeological features of the site including depth to water, groundwater flow direction, etc.

Environmental Assessment

The goal of this section is to describe the nature and extent of contamination at the site. When describing the nature of contamination, identify just the primary contaminants of concern (i.e., those that will likely drive remedial decisions/ actions). If there are many contaminants present within a group of contaminants (i.e., volatile organic compounds, semivolatile organic compounds, metals), identify the group(s) and one or two representative contaminants within the group. When addressing the extent of contamination, identify the areas of concern at the site, contaminated media (i.e., soil, groundwater, etc.), relative concentration levels, and a broad-brush description of contaminated areas/depths.

The reader should be able to know if contamination is widespread or limited and if concentrations are marginally or greatly above Standards, Criteria and Guidance (SGCs) for the primary contaminants. If the extent is described qualitatively (e.g., low, medium, high), representative concentrations should be given and compared with appropriate SCGs. For soil contamination, the concentrations should be compared with the soil cleanup objectives (SCOs) for the intended use of the site.

A typical Environmental Assessment would look like the following:

Based upon investigations conducted to date, the primary contaminants of concern for the site include cadmium and trichloroethene (TCE).
Soil - Cadmium is found in shallow soil, mostly near a dry well at the northeast end of the property. TCE is found in deeper soil, predominantly at the north end of the site. Concentrations of cadmium found on site (approximately 5 ppm) slightly exceed the soil cleanup objective (SCO) for unrestricted use (2.5 ppm). Concentrations of TCE found on site (5 ppm to 300 ppm) significantly exceed the soil cleanup objectives for the protection of groundwater (0.47 ppm).
Groundwater - TCE and its associated degradation products are also found in groundwater at the north end of the site, moderately exceeding groundwater standards (typically 5 ppb), with a maximum concentration of 1500 ppb. A moderate amount of TCE from the site has migrated 300 feet down-gradient off-site. The primary contaminant of concern for the off-site area is TCE, which is present at a maximum concentration of 500 ppb, at 10 feet below the groundwater table near Avenue A.
Soil Vapor & Indoor Air - TCE was detected in soil vapor at elevated concentrations and was also detected in indoor air at concentrations up to 1,000 micrograms per cubic meter.

If any changes to Section IV are required prior to application approval, a new page, initialed by each requestor, must be submitted.

SECTION V ADDITIONAL REQUESTOR INFORMATION

Representative Name, Address, etc.

Provide information for the requestor's authorized representative. This is the person to whom all correspondence, notices, etc. will be sent, and who will be listed as the contact person in the BCA. Invoices will be sent to the representative of Applications determined to be Participants unless another contact name and address is provided with the application.

Consultant and Attorney Name, Address, etc.

Provide requested information.

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SECTION VI CURRENT PROPERTY OWNER/OPERATOR INFORMATION (IF NOT A REQUESTOR)

Owner Name, Address, etc.

Provide requested information of the current owner of the property. List all parties holding an interest in the Property and, if the Requestor is not the current owner, describe the Requestor's relationship to the current owner.

Operator Name, Address, etc.

Provide requested information of the current operator (if different from the requestor or owner).

Provide a list of previous property owners and operators with names, last known addresses, telephone numbers and the Requestor's relationship to each owner and operator as a separate attachment

SECTION VII REQUESTOR ELIGIBILITY INFORMATION

As a separate attachment, provide complete and detailed information in response to any eligibility questions answered in the affirmative. It is permissible to reference specific sections of existing property reports; however, it is requested that such information be summarized. For properties with multiple addresses or tax parcels, please include this information for each address or tax parcel.

SECTION VIII PROPERTY ELIGIBILITY INFORMATION

As a separate attachment, provide complete and detailed information in response to the following eligibility questions answered in the affirmative. It is permissible to reference specific sections of existing property reports; however, it is requested that that information be summarized.

1. CERCLA / NPL Listing

Has any portion of the property ever been listed on the National Priorities List (NPL) established under CERCLA? If so, provide relevant information.

2. Registry Listing

Has any portion of the property ever been listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites established under ECL 27-1305? If so, please provide the site number and classification. See the Division of Environmental Remediation (DER) website for a database of sites with classifications.

3. RCRA Listing

Does the property have a Resource Conservation and Recovery Act (RCRA) TSDF Permit in accordance with the ECL 27-0900 *et seq*? If so, please provide the EPA Identification Number, the date the permit was issued, and its expiration date. Note: for purposes of this application, interim status facilities are not deemed to be subject to a RCRA permit.

4. Registry / RCRA sites owned by volunteers

If the answer to question 2 or 3 above is yes, is the site owned by a volunteer as defined under ECL 27-1405(1)(b), or under contract to be transferred to a volunteer? Attach any information available to the requestor related to previous owners or operators of the facility or property and their financial viability, including any bankruptcy filing and corporate dissolution documentation.

SECTION VIII (continued)

5. Existing Order

Is the property subject to an order for cleanup under Article 12 of the Navigation Law or Article 17 Title 10 of the ECL? If so, please provide information on an attachment. Note: if the property is subject to a stipulation agreement, relevant information should be provided; however, property will not be deemed ineligible solely on the basis of the stipulation agreement.

6. Enforcement Action Pending

Is the property subject to an enforcement action under Article 27, Titles 7 or 9 of the ECL or subject to any other ongoing state or federal enforcement action related to the contamination which is at or emanating from the property? If so, please provide information on an attachment.

SECTION IX CONTACT LIST INFORMATION

Provide the names and addresses of the parties on the Site Contact List (SCL) and a letter from the repository acknowledging agreement to act as the document repository for the proposed BCP project.

SECTION X LAND USE FACTORS

In addition to eligibility information, site history, and environmental data/reports, the application requires information regarding the current, intended and reasonably anticipated future land use.

1. This information consists of responses to the “land use” factors to be considered relative to the “Land Use” section of the BCP application. The information will be used to determine the appropriate land use in conjunction with the investigation data provided, in order to establish eligibility for the site based on the definition of a “brownfield site” pursuant to ECL 27-1405(2).

2. This land use information will be used by DEC, in addition to all other relevant information provided, to determine whether the proposed use is consistent with the currently identified, intended and reasonably anticipated future land use of the site at this stage. Further, this land use finding is subject to information regarding contamination at the site or other information which could result in the need for a change in this determination being borne out during the remedial investigation.

SECTION XI SIGNATURE PAGE

The Requestor must sign the application, or designate a representative who can sign. The requestor’s consultant or attorney cannot sign the application. If there are multiple parties applying, then each must sign a signature page. If the requestor is a Corporation, LLC, LLP or other entity requiring authorization from the NYS Department of State to conduct business in NYS, the entity’s name must appear exactly as given in the NYS Department of State's Corporation & Business Entity Database.

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DETERMINATION OF A COMPLETE APPLICATION

1. The first step in the application review and approval process is an evaluation to determine if the application is complete. To help ensure that the application is determined complete, requestors should review the list of common application deficiencies and carefully read these instructions.

2. DEC will send a notification to the requestor within 30 calendar days of receiving the application, indicating whether such application is complete or incomplete.

3. An application must include the following information relative to the site identified by the application, necessary for making an eligibility determination, or it will be deemed incomplete. (**Please note:** the application *as a whole* requires more than the information outlined below to be determined complete). The application must include:

    a. for all sites, an investigation report sufficient to demonstrate the site requires remediation in order to meet the requirements of the program, and that the site is a brownfield site at which contaminants are present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance adopted by DEC that are applicable based on the reasonably anticipated use of the property, in accordance with applicable regulations. Required data includes site drawings requested in Section III, #3 of the BCP application form.

    b. for those sites described below, documentation relative to the volunteer status of all requestors, as well as information on previous owners or operators that may be considered responsible parties **and** their ability to fund remediation of the site. This documentation is required for:

        i. real property listed in the registry of inactive hazardous waste disposal sites as a class 2 site, which may be eligible provided that DEC has not identified any responsible party for that property having the ability to pay for the investigation or cleanup of the property prior to the site being accepted into the BCP; or

        ii. real property that was a hazardous waste treatment, storage or disposal facility having interim status pursuant to the Resource Conservation and Recovery Act (RCRA) program, which may be eligible provided that DEC has not identified any responsible party for that property having the ability to pay for the investigation or cleanup of the property prior to the site being accepted into the BCP.

    c. for sites located within the five counties comprising New York City, in addition to (a) and if applicable (b) above, if the application is seeking a determination that the site is eligible for tangible property tax credits, sufficient information to demonstrate that the site meets one or more of the criteria identified in ECL 27 1407(1-a). **If this determination is not being requested in the application to participate in the BCP, the applicant may seek this determination at any time before issuance of a certificate of completion, using the BCP Amendment Application, except for sites seeking eligibility under the underutilized category.**

    d. for sites previously remediated pursuant to Titles 9, 13, or 14 of ECL Article 27, Title 5 of ECL Article 56, or Article 12 of Navigation Law, relevant documentation of this remediation.

DETERMINATION OF A COMPLETE APPLICATION (continued)

4. If the application is found to be incomplete:

    a. the requestor will be notified via email or phone call regarding minor deficiencies. The requestor must submit information correcting the deficiency to DEC within the 30-day review time frame; or

    b. the requestor will receive a formal Letter of Incomplete Application (LOI) if an application is substantially deficient, if the information needed to make an eligibility determination identified in #4 above is missing or found to be incomplete, or if a response to a minor deficiency is not received within the 30-day period. The LOI will detail all of the missing information and request submission of the information. If the information is not submitted within 30 days from the date of the LOI, the application will be deemed withdrawn. In this case, the requestor may resubmit the application without prejudice.

5. If the application is determined to be complete, DEC will send a Letter of Complete Application (LOC) that includes the dates of the public comment period. The LOC will:

    a. include an approved public notice to be sent to all parties on the Contact List included with the application;

    b. provide instructions for publishing the public notice in the newspaper on the date specified in the letter, and instructions for mailing the notice to the Contact List;

    c. identify the need for a certification of mailing form to be returned to DEC along with proof of publication documentation; and

    d. specify the deadline for publication of the newspaper notice, which must coincide with, or occur before, the date of publication in the Environmental Notice Bulletin (ENB).

        i. DEC will send a notice of the application to the ENB. As the ENB is only published on Wednesdays, DEC must submit the notice by the Wednesday before it is to appear in the ENB.

        ii. The mailing to parties on the Contact List must be completed no later than the Tuesday prior to ENB publication. If the mailings, newspaper notice and ENB notice are not completed within the time-frames established by the LOC, the public comment period on the application will be extended to insure that there will be the required comment period.

        iii. Marketing literature or brochures are prohibited from being included in mailings to the Contact List.

ATTACHMENT A
SECTION I: REQUESTOR INFORMATION

Copies of the entity information for Van Siclen Realty LLC (Requestor) from the NYS Department of State Division of Corporations are included with this attachment. Members of Van Siclen Realty LLC include Lisa Inzerillo and Frank Inzerillo.

NYS Department of State

Division of Corporations

Entity Information

The information contained in this database is current through March 20, 2018.

Selected Entity Name: VAN SICLEN REALTY LLC

Selected Entity Status Information

Current Entity Name:	VAN SICLEN REALTY LLC
DOS ID #:	5099903
Initial DOS Filing Date:	MARCH 10, 2017
County:	RICHMOND
Jurisdiction:	NEW YORK
Entity Type:	DOMESTIC LIMITED LIABILITY COMPANY
Current Entity Status:	ACTIVE

Selected Entity Address Information

DOS Process (Address to which DOS will mail process if accepted on behalf of the entity)

VAN SICLEN REALTY LLC
60 LYMAN PLACE
STATEN ISLAND, NEW YORK, 10304

Registered Agent

REGISTERED AGENT REVOKED

, ,

This office does not require or maintain information regarding the names and addresses of members or managers of nonprofessional limited liability companies. Professional limited liability companies must include the name(s) and address(es) of the original members, however this information is not recorded and only available by viewing the certificate.

***Stock Information**

# of Shares	Type of Stock	$ Value per Share
No Information Available		

*Stock information is applicable to domestic business corporations.

Name History

Filing Date	Name Type	Entity Name
MAR 10, 2017	Actual	VAN SICLEN REALTY LLC

A **Fictitious** name must be used when the **Actual** name of a foreign entity is unavailable for use in New York State. The entity must use the fictitious name when conducting its activities or business in New York State.

NOTE: New York State does not issue organizational identification numbers.

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ATTACHMENT B
SECTION II: PROJECT DESCRIPTION

Purpose and Scope of the Project

The purpose of the project is to develop a contaminated parcel of land into a viable residential space, while implementing remedial measures that are protective of human health and the environment. Redevelopment plans for the site are still in the early planning stages, but conceptual designs include a residential building with a portion dedicated to low-income affordable units.

According to the on-line New York City's Zoning and Land Use Map (17c), the site is located within a Special Mixed Use Paired Manufacturing and Residential District (M1-4/R6A). This paired district promotes development and expansion of the longstanding mix of residential, commercial, industrial, and cultural use throughout the area. M1 districts typically include light industrial uses, such as woodworking shops, repair shops, and wholesale service and storage facilities, and R6A districts promote residential development with high lot coverage. Zoning is consistent with the proposed residential development. The surrounding area is primarily residential and industrial, but also includes commercial buildings, public facilities, day care centers, and schools.

As a result of the City Environmental Quality Review (CEQR) process, Block 3978, Lots 14 and 15 were assigned an E-Designation (E-366) on April 20, 2016 by the New York City Department of City Planning (NYCDCP) as part of the East New York rezoning (CEQR No. 15DCP102K). The E-Designation requires coordination with the New York City Office of Environmental Remediation (NYC OER) to obtain a Notice to Proceed (NTP) or a Notice of No Objection (NNO) prior to obtaining building permits. The E-Designation addresses environmental requirements for Hazardous Materials and Noise (window wall attenuation and alternative means of ventilation) during development. Start of construction is projected for April/May 2020 with Certificate of Completion in 2021.

Estimated Project Schedule

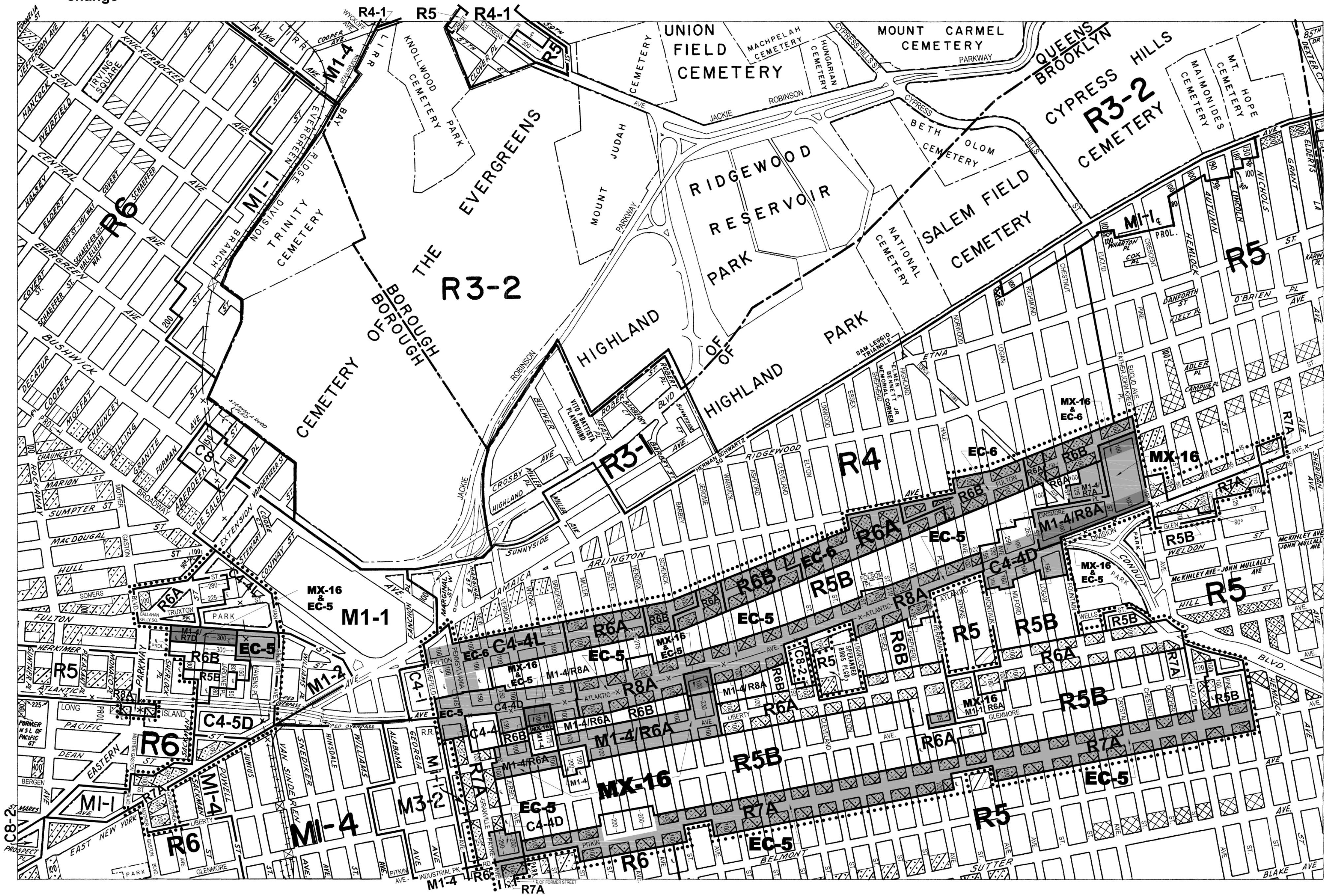
The below table presents an estimated project schedule.

Attachment B - Estimated BCP Schedule
544 and 546 Locust Street
Langan Project No.: 170473201

203 - 207 Van Siclen Avenue Estimated BCP Timeline		2018					2019										2020											2021										
Item #	Action	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	BCP Application Public Comment / BCA	■	■	■	■	■																																			
2	CPP - Preparation and Submittal						■																																		
3	RIWP Preparation						■	■																																	
4	DEC RIWP Review and Public Comment								■	■	■																															
5	RIWP Implementation / RIR											■	■	■	■																											
6	DEC Review and Approval of RIR															■	■																									
7	RAWP Preparation																	■	■																							
8	DEC RAWP Review / Public Comment / Approval																			■	■	■	■																			
9	RAWP Implementation / Foundation Construction																							■	■	■	■	■	■	■												
10	FER Preparation																													■	■	■										
11	DEC Review of FER																															■	■	■								
12	Certificate of Completion																																		■							

Notes:
BCP = Brownfield Cleanup Program
BCA = Brownfield Cleanup Agreement
RIWP = Remedial Investigation Work Plan
CPP = Citizen Participation Plan
RI = Remedial Investigation
RIR = Remedial Investigation Report
RAWP = Remedial Action Work Plan
FER = Final Engineering Report
It is presumed a Track 1 cleanup will be achieved and a Site Management Plan will not be required.

Click blue outline on map to view diagram of proposed zoning change



600 0 600 1200 1800 FEET

C1-1 C1-2 C1-3 C1-4 C1-5 C2-1 C2-2 C2-3 C2-4 C2-5

NOTE: Where no dimensions for zoning district boundaries appear on the zoning maps, such dimensions are determined in Article VII, Chapter 6 (Location of District Boundaries) of the Zoning Resolution.

ZONING MAP

THE NEW YORK CITY PLANNING COMMISSION

Major Zoning Classifications:

The number(s) and/or letter(s) that follows an **R**, **C** or **M** District designation indicates use, bulk and other controls as described in the text of the Zoning Resolution.

R – RESIDENTIAL DISTRICT

C – COMMERCIAL DISTRICT

M – MANUFACTURING DISTRICT

SPECIAL PURPOSE DISTRICT
The letter(s) within the shaded area designates the special purpose district as described in the text of the Zoning Resolution.

AREA(S) REZONED

Effective Date(s) of Rezoning:

*05-24-2017 C 170142 ZMK
04-20-2016 C 160035 ZMK

Special Requirements:

For a list of lots subject to CEQR environmental requirements, see APPENDIX C.

For a list of lots subject to "D" restrictive declarations, see APPENDIX D.

For Inclusionary Housing designated areas and Mandatory Inclusionary Housing areas on this map, see APPENDIX F.

MAP KEY

13b	13d	14b
17a	**17c**	18a
17b	17d	18b

ZONING MAP 17c

NOTE: Zoning information as shown on this map is subject to change. For the most up-to-date zoning information for this map, visit the Zoning section of the Department of City Planning website: **www.nyc.gov/planning** or contact the Zoning Information Desk at (212) 720-3291.

ATTACHMENT C
SECTION III: PROPERTY'S ENVIRONMENTAL HISTORY

Item 1 - Reports

Preliminary Due Diligence Review, performed in February 2018 by Langan

Langan performed a review of an environmental database search provided by Environmental Data Resources (EDR), Sanborn Fire Insurance maps, and New York City Department of (NYCDOB) Records to identify historical site uses. In addition, a search of the NYSDEC Bulk Storage and Spills Incidents electronic databases was performed. The following presents a summary of the findings of the preliminary due diligence review:

Site Description

The site is identified as Tax Block 3978, Lots 14 and 15 in the East New York neighborhood of Brooklyn, New York. The site is bound to the north by Liberty Avenue followed by residences; to the east by residences and an auto body shop followed by Hendrix Avenue; to the south by a vacant lot and residences followed by Glenmore Avenue; and to the west by Van Siclen Avenue followed by mixed-use commercial/residential buildings.

The site is currently used for storage of construction equipment. Prior to May 2018, the site was used for the storage and maintenance of automobiles and automotive parts. The site was assigned an E-Designation (E-366) for Hazardous Materials and Noise Attenuation by the New York City Department of City Planning pursuant to the East New York rezoning (CEQR No. 15DCP102K).

Sanborn Map Review

Sanborn® Fire Insurance Maps from 1887 to 2007 were reviewed. As early as 1887, the site was divided into four adjoining tax lots and occupied by one 2-story dwelling with a basement. By 1908, the site was vacant and unimproved. From at least 1928 to 1966, the site was occupied by a 4-story residential building with a store. By 1977, Lot 14 was vacant and unimproved, and the entire site was vacant and unimproved by 1981.

Adjoining and surrounding properties were generally depicted with multi-story residential, commercial, and light-industrial buildings circa 1887 through 2005. Adjoining and surrounding properties of environmental interest included:

- 529 Liberty Avenue (about 50 feet north of the site; hydraulically up-gradient) – An auto body repair facility, gasoline filling station, and three underground storage tanks (USTs) from about 1928 to 1966

- 2798 Atlantic Avenue (about 200 feet north of the site; hydraulically up-gradient) - A coal and lumber processing facility from about 1908 to 1928
- 181 Van Siclen Avenue (about 200 feet north of the site; hydraulically up-gradient) - A garage and repair shop in about 1928
- 505 Liberty Avenue (about 200 feet west of the site; hydraulically cross-gradient) - A garage with two USTs from about 1928 to 1981
- 542 Liberty Avenue (about 200 feet east of the site; cross-gradient east)
- 243 Hendrix Street (about 300 feet northeast of the site; hydraulically up-gradient) - A gasoline filling station and auto repair shop from about 1951 to 1968
- 227 Miller Avenue (about 350 feet northwest of the site; hydraulically up-gradient) - An unspecified manufacturer from 1928 to 2004

New York City Department of Buildings Database

Langan conducted a records search through the NYCDOB online query system on February 9, 2018 for the site. The Department of Finance building classification for each of the two lots are Z9 – Miscellaneous. Certificates of occupancy (CO) for the site were not identified in the records.

NYSDEC's Bulk Storage and Spills Databases

Langan's review of NYSDEC's electronic Bulk Storage and Spills Databases on February 9, 2018 did not identify petroleum bulk storage tanks associated with the site. The site was listed in the NY SPILLS database under an alternative address of 522 Liberty Avenue. Spill No. 9601652 was reported at 522 Liberty Avenue on May 1, 1996 when the New York Police Department (NYPD) executed a search warrant for an illegal chop shop and discovered the site contaminated with various chemicals, oils, and other unknown materials. Spill case notes indicated that unknown amounts of unknown material, unknown hazardous material, and unknown petroleum were spilled across the surface of the site. The spill was closed on May 2, 1996; however, cleanup documentation was not provided in the records.

<u>Limited Subsurface Investigation Data Summary, 203-207 Van Siclen Avenue, Prepared by Langan, dated March 2018 (see CD)</u>

A limited subsurface investigation was conducted on February 15, 2018 to investigate potential impacts associated with its historical site use as an auto scrap yard and Spill No. 9601652. The limited subsurface investigation included the following:

- A geophysical survey to locate potential USTs and other subsurface structures;
- Advancement of ten soil borings to depths up to 40 feet below grade surface (bgs), and collection of 14 soil samples.

- Installation of one temporary groundwater monitoring well to about 40 feet bgs, and collection of one groundwater sample.
- Installation of two soil vapor points to about 10 feet bgs, and the collection of two soil vapor samples.

The following is a summary of subsurface investigation results:

Geophysical Survey – The geophysical survey did not identify anomalies consistent with USTs. Sub-surface utilities were noted and boring locations were adjusted accordingly to avoid them.

Soil – Historical fill material was observed within each soil boring to depths ranging from 5 to 16 feet bgs. The fill primarily consisted of brown fine- to coarse-grained sand with varying amounts gravel, silt, concrete, brick, coal, steel fragments, and glass and other debris. Native deposits encountered beneath the historically fill predominantly consisted of fine- to coarse-grained sand with varying amounts silt and fine gravel. Bedrock was not encountered. Based on analytical results, the following constituents were detected in soil samples at concentrations that exceed their respective New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use (UU) and/or Restricted Use –Restricted Residential (RRU) Soil Cleanup Objectives (SCO).

- Volatile Organic Compounds (VOCs) were detected above the NYSDEC Part 375 UU SCOs in 1 of the 14 soil samples, but RRU SCOs were not exceeded. The UU SCOs are indicated in parentheses.
    - Ethylbenzene – 1.40 milligrams per kilogram (mg/kg) in SB01_0-2 (1 mg/kg)
    - Total Xylenes – 8.90 mg/kg in SB01_0-2 (0.26 mg/kg)

- Semivolatile Organic Compounds (SVOCs) were detected above NYSDEC Part 375 UU and/or RRU SCOs in 11 of the 14 soil samples. The SCOs are indicated in parentheses.
    - Benzo(a)anthracene – from 1.11 mg/kg in SB02_7-8 to 14.3 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)
    - Benzo(a)pyrene – from 1.06 mg/kg in SB02_7-8 to 12.10 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)
    - Benzo(b)fluoranthene – from 1.69 mg/kg in SB03_0-2 to 13.9 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)
    - Benzo(k)fluoranthene – from 1.42 mg/kg in SB03_0-2 to 8.99 mg/kg in SB02_0-1 (UU SCO of 0.8 mg/kg and RRU SCO of 3.9 mg/kg)

  - Chrysene – from 1.02 mg/kg in SB02_7-8 to 14.80 mg/kg in SB02_0-1 (UU SCO of 1 mg/kg and RRU SCO of 3.9 mg/kg)
  - Dibenzo(a,h)anthracene – from 0.47 mg/kg in SB03_0-2 to 4.24 mg/kg in SB02_0-1 (UU and RRU SCO of 0.330 mg/kg)
  - Indeno(1,2,3-cd)pyrene – from 0.65 mg/kg in SB06_0-1 to 4.92 mg/kg in SB02_0-1 (UU and RRU SCO of 0.5 mg/kg)

- Pesticides were detected above NYSDEC Part 375 UU SCO in 9 of the 14 soil samples, but RRU SCOs were not exceeded. The UU SCOs are indicated in parentheses.
  - 4,4'-DDD – from 0.0037 mg/kg in SB09_1-2 to 0.0092 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - 4,4'-DDE – from 0.0035 mg/kg in SB05_0-2 and SB09_1-2 to 0.0157 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - 4,4'-DDT – from 0.0035 mg/kg in SB08_0-2 to 0.0483 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - Dieldrin – from 0.0055 mg/kg in SB02_7-8 to 0.0115 mg/kg in SB02_0-1 (0.005 mg/kg)

- Metals were detected above NYSDEC Part 375 UU and/or RRU SCOs in 13 of the 14 soil samples. The SCOs are indicated in parentheses.
  - Barium – from 489 mg/kg in SB04_0-2 to 9,060 mg/kg in SB07_0-2 (UU SCO of 350 mg/kg and RRU SCO of 400 mg/kg)
  - Cadmium – from 2.94 mg/kg in SB05_0-2 to 7.36 mg/kg in SB10_0-2 (UU SCO of 2.5 mg/kg and RRU SCO of 4.3 mg/kg)
  - Chromium (Hexavalent) – from 3.66 mg/kg in SB03_0-2 and 4.19 mg/kg in SB09_1-2 (UU SCO of 1 mg/kg)
  - Chromium (Trivalent) – 30.5 mg/kg in SB06_0-1 (UU SCO of 30 mg/kg)
  - Copper – from 59.6 mg/kg in SB04_0-2 to 454 mg/kg in SB05_0-2 (UU SCO of 50 mg/kg and RRU SCO of 270 mg/kg)
  - Lead – from 66.2 mg/kg in SB01_0-2 to 8,530 mg/kg in SB07_0-2 (UU SCO of 63 mg/kg and RRU SCO of 400 mg/kg)
  - Mercury – from 0.18 mg/kg in SB03_5.5-6 to 7.43 mg/kg in SB03_0-2 (UU SCO of 0.18 mg/kg and RRU SCO of 0.81 mg/kg)
  - Nickel – 30.9 mg/kg in SB06_0-1 (UU SCO of 30 mg/kg)
  - Zinc – from 120 mg/kg in SB01_0-2 to 10,900 mg/kg in SB02_0-1 (UU SCO of 109 mg/kg and RRU SCO of 10,000 mg/kg)

- Polychlorinated Biphenyls (PCBs) were detected above NYSDEC Part 375 UU in one of the 14 soil samples. The SCOs are indicated in parentheses.
    - Total PCBs (Aroclors 1248 and 1260) – 0.259 mg/kg in SB10_0-2 (UU SCO of 0.1 mg/kg)

Groundwater – Groundwater was encountered at about 38 feet bgs in the temporary monitoring well TMW01, which was located in the central portion of the site. Based on the surface topography of the site and surrounding area, the assumed regional groundwater flow direction is to the south towards Jamaica Bay. Because of poor recharge and limited sample volume, analysis was limited to VOCs, pesticides, and PCBs. The VOC chloroform was reported at a concentration of 12.9 micrograms per liter (µg/L), which exceeds the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS) of µg/L.

Soil Vapor – Soil vapor analytical results were compared to NYSDOH Soil Vapor/Indoor Air Matrices A, B, and C (revised in May 2017) of the Guidance for Evaluating Soil Vapor Intrusion. NYSDOH provides decision matrices for eight chlorinated VOCs (carbon tetrachloride, 1,1-dichloroethene, cis-1,2-dichloroethene, trichloroethene, methylene chloride, tetrachloroethene, 1,1,1-trichloroethane, and vinyl chloride). The decision matrices recommend a range of response actions based on the soil vapor and indoor air concentrations. In the absence of indoor air samples, soil vapor results were compared to the lowest concentrations in soil vapor that trigger a mitigation recommendation. Several VOCs were detected in soil vapor, but concentrations did not exceed the minimum NYSDOH Decision Matrix Values.

Item 2 - Sampling Data

Tables C-1, C-2, and C-3 (included in this attachment) summarize the results of the soil, groundwater, and soil vapor samples collected during the February 2018 Limited Subsurface Investigation Data Summary. The tabulated results are compared to regulatory comparison criteria (respective to the media), and compounds that exceed the regulatory criteria are summarized below.

Soil – The following compounds were detected at concentrations exceeding NYSDEC Part 375 UU and/or RRU SCOs:

- VOCs: Ethylbenzene, and total xylenes
- SVOCs: Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene

- Pesticides: 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin
- Metals: Barium, cadmium, chromium (hexavalent), chromium (trivalent), copper, lead, mercury, nickel, and zinc
- Total PCBs: Aroclors 1248 and 1260

Groundwater – The following compound was detected at a concentration exceeding the NYSDEC TOGS SGV:

- VOCs: Chloroform

Soil Vapor – Soil vapor sample results did not exceed NYSDOH matrix concentrations that trigger mitigation.

Item 3 – Site Drawings

Figures C-1, C-2, and C-3 (included in this attachment) present locations and summary and results of the soil, groundwater, and soil vapor samples that exceed the regulatory comparison criteria.

Item 4 – Previous Land Use

The site is currently used for storage of construction equipment. Prior to about May 2017, the site was used for storage and maintenance of automobiles. Historical site use included a 4-story residential building with a store from about 1928 to 1966, and a 2-story dwelling with a basement prior to about 1908.

TABLES AND FIGURES

Table C-1
Soil Sample Results Summary
Limited Subsurface Investigation
203-207 Van Siclen Avenue
Brooklyn, New York
Langan Project No. 170513001

Sample Location	Unrestricted Use SCOs	Restricted-Use Restricted Residential SCOs	SB01		SB02		SB03		SB04		SB05	SB06	SB07	SB08	SB09	SB10
Sample ID			SB01_0-2	SB01_5-6	SB02_0-1	SB02_7-8	SB03_0-2	SB03_5.5-6	SB04_0-2	SB04_6-7	SB05_0-2	SB06_0-1	SB07_0-2	SB08_0-2	SB09_1-2	SB10_0-2
Laboratory ID			18B0633-03	18B0633-04	18B0633-01	18B0633-02	18B0633-05	18B0633-06	18B0633-07	18B0633-08	18B0633-09	18B0633-10	18B0633-11	18B0633-12	18B0633-13	18B0633-14
Sampling Date			2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018	2/15/2018
Sample Depth (feet bgs)			0 to 2	5 to 6	0 to 1	7 to 8	0 to 2	5.5 to 6	0 to 2	6 to 7	0 to 2	0 to 1	0 to 2	0 to 2	1 to 2	0 to 2
Volatile Organic Compounds (mg/kg)																
1,2,4-Trimethylbenzene	3.600	52	0.008	0.002 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U	0.003 U	0.003 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
1,3,5-Trimethylbenzene	8.400	52	0.003 J	0.002 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U	0.003 U	0.003 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
2-Butanone	0.120	100	0.002 U	0.002 U	0.002 U	0.005 J	0.002 U	0.003 U	0.003 U	0.003 U	0.003 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
Acetone	0.0500	4.8	0.012	0.021	0.007 J	0.037	0.005 U	0.005 U	0.006 U	0.007 J	0.016	0.006 J	0.016	0.004 U	0.006 U	0.006 J
Ethyl Benzene	1	41	1.40 D	0.002 U	0.002 U	0.003 U	0.002 U	0.003 U	0.004 J	0.003 U	0.003 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
Methylene chloride	0.0500	100	0.006 J	0.004 U	0.005 U	0.005 U	0.005 J	0.005 U	0.006 U	0.010 J	0.006 U	0.006 J	0.011 J	0.006 J	0.006 U	0.006 U
Naphthalene	12		0.004 J	0.002 J	0.005 J	0.004 J	0.002 U	0.003 U	0.004 J	0.003 U	0.003 U	0.002 U	0.004 J	0.002 U	0.003 U	0.003 U
n-Propylbenzene	3.900	100	0.002 J	0.002 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U	0.003 U	0.003 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
o-Xylene	~	~	2.300 D	0.002 U	0.003 J	0.003 U	0.002 U	0.003 U	0.008	0.003 U	0.003 U	0.002 U	0.003 U	0.002 U	0.003 U	0.003 U
p- & m- Xylenes	~	~	6.600 D	0.004 U	0.007 J	0.005 U	0.005 U	0.005 U	0.018	0.006 U	0.006 U	0.005 U	0.006 U	0.004 U	0.006 U	0.006 U
Xylenes, Total	0.260	100	8.90 D	0.006 U	0.010 J	0.008 U	0.007 U	0.008 U	0.026	0.009 U	0.009 U	0.007 U	0.009 U	0.007 U	0.009 U	0.009 U
Semivolatile Organic Compounds (mg/kg)																
Acenaphthene	20	100	0.0762 JD	0.0461 U	1.6200 D	0.1110 D	0.3030 D	0.0473 U	0.4650 D	0.0447 U	0.2320 D	0.0510 U	0.2670 D	0.2530 D	0.3450 D	0.3980 D
Acenaphthylene	100	100	0.3230 D	0.0461 U	1.2500 D	0.1110 D	0.2070 D	0.0473 U	0.5150 D	0.0447 U	0.5110 D	0.0520 JD	0.2280 D	0.2700 D	0.3780 D	0.3750 D
Anthracene	100	100	0.4450 D	0.1200 D	5.3800 D	0.3640 D	1.0100 D	0.0686 JD	1.6900 D	0.0447 U	0.8120 D	0.2720 D	1.0900 D	1.0400 D	1.4300 D	1.1700 D
Benzo(a)anthracene	1	1	**2.15** D	0.47 D	**14.30** D	**1.11** D	**2.46** D	0.27 D	**4.28** D	0.10 D	**3.04** D	0.98 D	**2.76** D	**3.20** D	**3.87** D	**4.17** D
Benzo(a)pyrene	1	1	**2.23** D	0.39 D	**12.10** D	**1.06** D	**2.06** D	0.26 D	**3.76** D	0.10 D	**3.49** D	0.99 D	**2.72** D	**3.15** D	**3.86** D	**4.41** D
Benzo(b)fluoranthene	1	1	**1.81** D	0.28 D	**13.90** D	0.94 D	**1.69** D	0.22 D	**3.35** D	0.07 JD	**2.98** D	0.83 D	**2.53** D	**2.86** D	**3.33** D	**4.21** D
Benzo(g,h,i)perylene	100	100	1.46 D	0.20 D	5.03 D	0.76 D	1.12 D	0.19 D	2.54 D	0.07 JD	2.67 D	0.72 D	1.55 D	2.26 D	2.94 D	2.79 D
Benzo(k)fluoranthene	0.800	3.9	1.43 D	0.31 D	**8.99** D	0.76 D	1.42 D	0.22 D	2.56 D	0.07 JD	2.82 D	0.72 D	1.87 D	2.44 D	2.96 D	**3.97** D
Chrysene	1	3.9	2.07 D	0.43 D	**14.80** D	1.02 D	2.25 D	0.24 D	**4.12** D	0.09 D	3.11 D	0.92 D	2.89 D	3.27 D	**3.94** D	**4.31** D
Dibenzo(a,h)anthracene	0.330	0.330	**0.53** D	0.05 JD	**4.24** D	0.27 D	**0.47** D	0.06 JD	**0.91** D	0.04 U	**0.88** D	0.23 D	**0.56** D	**0.85** D	**1.02** D	**1.42** D
Dibenzofuran	7		0.0473 U	0.0461 U	0.9260 D	0.0682 JD	0.1670 D	0.0473 U	0.2520 D	0.0447 U	0.0510 U	0.0510 U	0.1760 D	0.1130 D	0.1900 D	0.2010 D
Fluoranthene	100	100	4.1000 D	0.7940 D	35.7000 D	2.2700 D	4.7900 D	0.4330 D	9.5400 D	0.1900 D	6.6200 D	1.6400 D	6.7600 D	7.6400 D	9.0300 D	9.4000 D
Fluorene	30	100	0.0656 JD	0.0611 JD	2.12 D	0.1400 D	0.3730 D	0.0473 U	0.5520 D	0.0447 U	0.0510 U	0.0756 JD	0.3200 D	0.2960 D	0.4280 D	0.3320 D
Indeno(1,2,3-cd)pyrene	0.500	0.500	**1.30** D	0.19 D	**4.92** D	**0.69** D	**1.04** D	0.17 D	**2.30** D	0.05 JD	**2.48** D	**0.65** D	**1.52** D	**2.00** D	**2.49** D	**2.46** D
Naphthalene	12	100	0.0473 U	0.0461 U	1.0300 D	0.0625 JD	0.1150 D	0.0473 U	0.1990 D	0.0447 U	0.0554 JD	0.0510 U	0.0710 JD	0.0777 JD	0.1420 D	0.1490 D
Phenanthrene	100	100	1.5500 D	0.6570 D	19.8000 D	1.6800 D	4.5100 D	0.2990 D	6.6700 D	0.1980 D	2.9300 D	1.2300 D	4.7000 D	4.4200 D	5.6400 D	4.8700 D
Pyrene	100	100	3.1900 D	0.8850 D	25.3000 D	2.2300 D	3.7000 D	0.4150 D	6.6500 D	0.2580 D	5.1200 D	1.7300 D	4.8200 D	5.5900 D	6.6200 D	6.3200 D
Polychlorinated Biphenyls (PCB)																
Aroclor 1248	~	~	0.0190 U	0.0183 U	0.0195 U	0.0178 U	0.0193 U	0.0189 U	0.0190 U	0.0178 U	0.0535	0.0203 U	0.0194 U	0.0197 U	0.0190 U	0.1390
Aroclor 1260	~	~	0.0190 U	0.0183 U	0.0381	0.0178 U	0.0193 U	0.0189 U	0.0249	0.0178 U	0.0435	0.0203 U	0.0194 U	0.0197 U	0.0190 U	0.1200
Total PCBs	0.100	1	0.0190 U	0.0183 U	0.0381	0.0178 U	0.0193 U	0.0189 U	0.0249	0.0178 U	0.0970	0.0203 U	0.0194 U	0.0197 U	0.0190 U	0.2590
Pesticides (mg/kg)																
4,4'-DDD	0.00330	13.0	0.0017 U	0.0016 U	0.0092 D	0.0040 D	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0037 D	0.0016 U
4,4'-DDE	0.00330	8.9	0.0017 U	0.0016 U	0.0157 DP	0.0076 D	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0035 D	0.0039 D	0.0017 U	0.0017 U	0.0035 D	0.0016 U
4,4'-DDT	0.00330	7.9	0.0056 D	0.0016 U	0.0483 D	0.0224 D	0.0185 D	0.0028 D	0.0026 D	0.0017 U	0.0225 D	0.0072 D	0.0092 D	0.0035 D	0.0285 D	0.0016 U
alpha-Chlordane	0.0940	0.4	0.0048 D	0.0016 U	0.0242 D	0.0155 D	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0075 D	0.0016 U	0.0017 U	0.0035 DP	0.0231 DP	0.0016 U
Dieldrin	0.00500	0.2	0.0029 D	0.0016 U	0.0115 D	0.0055 D	0.0045 D	0.0016 U	0.0017 U	0.0017 U	0.0046 D	0.0016 U	0.0017 U	0.0020 DP	0.0067 D	0.0016 U
Metals (mg/kg)																
Arsenic	13	16	3.26	5.89	4.97	3.25	6.96	5.42	5.80	6.79	4.27	5.24	6.53	4.48	5.43	5.03
Barium	350	400	216.00	103.00	**826**	175.00	**3,200**	300	**489**	37.30	**648**	**2,320**	**9,060** D	126	**842**	**662**
Cadmium	2.500	4.3	0.34 U	0.48	1.29	0.41	3.60	0.39	2.10	0.32 U	2.94	2.00	**5.09**	0.36 U	0.57	**7.36**
Chromium, Hexavalent	1	110	0.57 U	0.55 U	0.59 U	0.54 U	3.66	0.57 U	0.57 U	0.64	0.61 U	0.61 U	0.59 U	0.60 U	4.19	0.63 U
Chromium, Trivalent	30	180	10.20	15.90	17.50	17.50	9.34	19.40	17.80	9.15	28.70	30.50	27.60	17.40	16.90	18.00
Chromium	~	~	10.20	15.90	17.50	17.50	13.00	19.40	17.80	9.79	28.70	30.50	27.60	17.40	21.10	18.00
Copper	50	270	11.40	15.10	36	19.90	14.70	13.20	59.60	14.80	**454**	136	13.90	34.90	14.40	**349**
Cyanide, total	27	27	0.57 U	0.55 U	0.59 U	0.54 U	0.58	0.57 U	0.57 U	0.54 U	0.61 U	1.07	0.59 U	1.12	0.58 U	0.63 U
Lead	63	400	66.2	103	**887**	108	**1,070**	178	142	27	**543**	**572**	**8,530** D	**766**	**465**	**750**
Manganese	1,600	2,000	525.00	687	357	363	222	249	662	220	466	565	287	284	512	372
Mercury	0.180	0.81	0.05	0.10	0.45	0.10	**7.43**	0.18	0.34	0.07	0.31	0.48	**1.24**	0.34	0.13	**1.11**
Nickel	30	310	7.55	8.79	9.67	12.30	6.17	10.50	20.40	6.22	22.90	30.90	6.72	10.00	8.06	19.70
Selenium	3.900	180	1.14 U	1.10 U	1.17 U	1.07 U	1.16 U	1.13 U	1.14 U	1.07 U	1.22 U	1.22 U	1.60	1.19 U	1.15 U	1.25 U
Zinc	109	10,000	120	225	**10,900** D	613	1,300	159	364	37	715	1,300	5,030 D	162	560	994
Total Solids (%)																
Percent Solids	~	~	87.8	90.6	85.5	93.5	86.4	88.2	87.6	93.4	81.9	82.0	85.4	83.8	86.8	79.9

Notes:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 New York Codes, Rules and Regulations (NYCRR) Part 375 Unrestricted Use and Restricted Use Restricted-Residential Soil Cleanup Objectives (SCOs).
2. Only detected compounds are shown in the table.
3. Concentrations above Unrestricted Use SCOs are shaded.
4. Concentrations above Restricted Use Restricted-Residential SCOs are bold and shaded.
5. bgs = Below grade surface
6. ~ = No criteria has been established for this analyte.
7. mg/kg = Milligrams per kilogram

Qualifers:

D= Result is from an analysis that required a dilution. See laboratory reports for further details.
J = Analyte detected at or above the method detection limit but below the reporting limit; therefore the data is estimated.
U = Analyte not detected at or above the indicated reporting limit.

Table C-2
Groundwater Sample Results Summary
Limited Subsurface Investigation
203-207 Van Siclen Avenue
Brooklyn, New York
Langan Project No. 170513001

Sample Location Sample ID Laboratory ID Sampling Date Sample Depth (feet bgs)	NYSDEC TOGS SGVs	TMW01 TMW01_021518 18B0638-01 2/15/2018 30-40	
Volatile Organic Compounds (µg/L)			
2-Butanone	50	0.58	
Chloroform	7	**12.9**	
Tetrachloroethylene	5	2.27	
Trichloroethylene	5	0.32	J
Pesticides (µg/L)			
Total Pesticides	~	ND	
Polychlorinated Biphenyls (µg/L)			
Total PCBs	~	ND	

Notes:

1. Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Valuves (SGVs) for Class GA - Drinking Water.
2. Only detected compounds are shown in the table.
3. Concentrations detected above NYSDEC TOGS SGVs are bold and shaded.
4. µg/L = Micrograms per liter
5. ND = Not Detected
6. ~ = Criterion does not exist.
7. bgs = Below grade surface

Qualifiers:

U = Analyte not detected at or above the level indicated.
J = Analyte detected at or above the method detection limit but below the reporting limit; therefore data is estimated.

Table C-3
Soil Vapor Sample Results Summary
Limited Subsurface Investigation
203-207 Van Siclen Avenue
Brooklyn, New York
Langan Project No.: 170513001

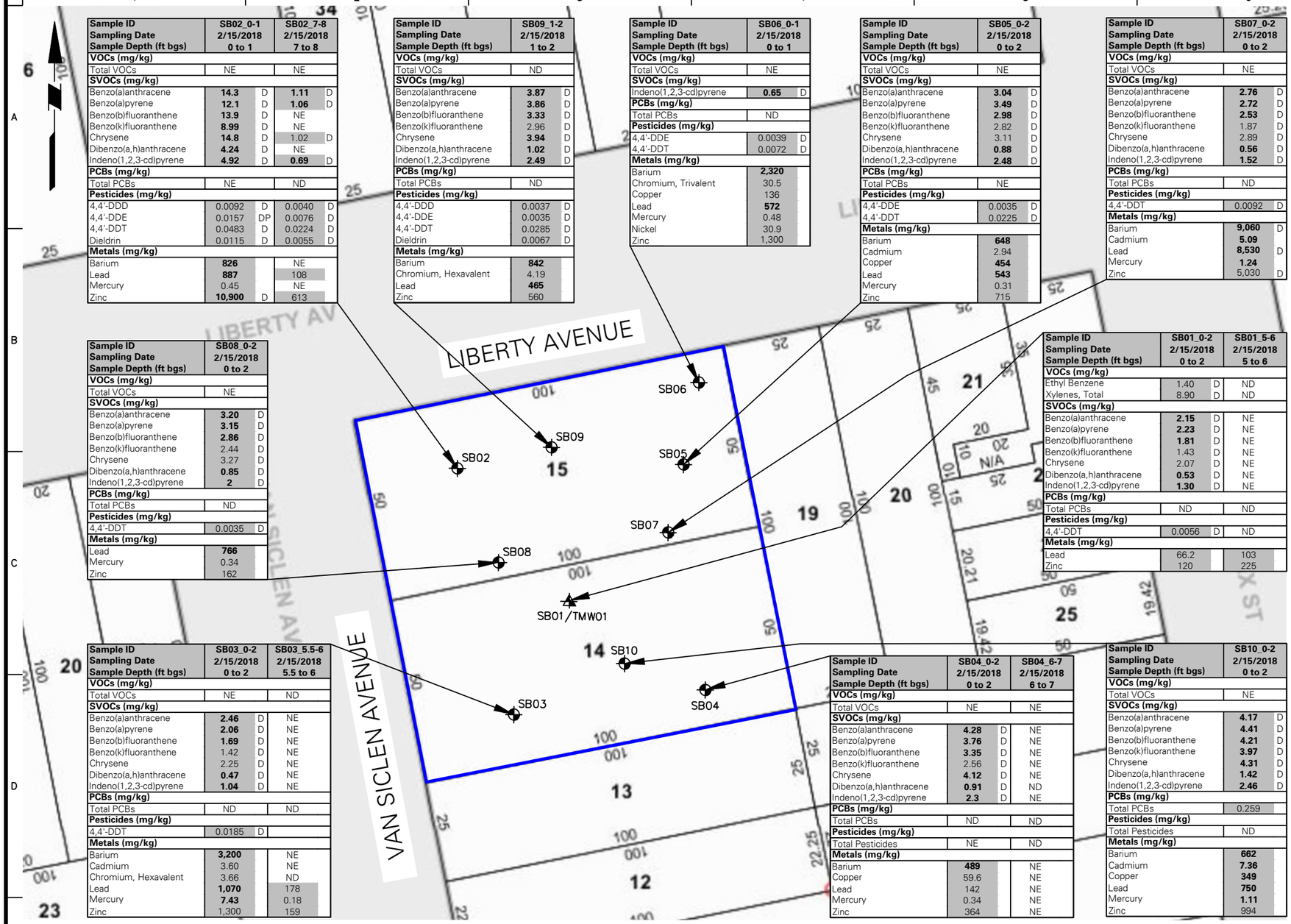
Sample Location Sample ID Laboratory ID Sampling Date Sample Depth (bgs)	NYSDOH Decision Matrix Values	SV01 SV01_021518 18B0628-02 2/15/2018 10		SV02 SV02_021518 18B0628-01 2/15/2018 10	
Volatile Organic Compounds (VOCs) (µg/m^3)					
1,2,4-Trimethylbenzene	~	57	D	63	D
1,3,5-Trimethylbenzene	~	14	D	15	D
1,3-Dichlorobenzene	~	1.1	D	0.93	U
2-Butanone	~	12	D	15	D
2-Hexanone	~	1.2	U	3.6	D
Acetone	~	50	D	65	D
Benzene	~	29	D	7.6	D
Carbon disulfide	~	0.450	U	15	D
Carbon tetrachloride	6	0.270	D	0.240	U
Chloroform	~	0.710	U	2.3	D
Cyclohexane	~	31	D	2.1	D
Dichlorodifluoromethane	~	2.7	D	2.2	D
Ethyl Benzene	~	39	D	27	D
Isopropanol	~	0.72	U	1.6	D
n-Heptane	~	25	D	29	D
n-Hexane	~	88	D	25	D
o-Xylene	~	43	D	41	D
p- & m- Xylenes	~	120	D	110	D
p-Ethyltoluene	~	69	D	75	D
Propylene	~	67	D	24	D
Styrene	~	25	D	26	D
Tetrachloroethylene	100	12	D	5.3	D
Toluene	~	51	D	19	D
Trichloroethylene	6	0.200	U	0.670	D
Trichlorofluoromethane (Freon 11)	~	98	D	51	D
Total VOCs	~	834		625	

Notes:

1. Soil vapor sample analytical results are compared to the lowest soil vapor concentrations for which monitoring or mitigation is recommended in Matrices A, B, and C of the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York.
2. Only compounds with detections are shown in the table.
3. µg/m^3 = Microgram per cubic meter
4. bgs = Below grade surface
5. ~ = No criteria has been established for this compound

Qualifiers:

D = Result is from an analysis that required a dilution. See laboratory report for further details.
U = Analyte not detected at or above the level indicated.



Sample ID	SB02_0-1		SB02_7-8	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 1		7 to 8	
VOCs (mg/kg)				
Total VOCs	NE		NE	
SVOCs (mg/kg)				
Benzo(a)anthracene	**14.3**	D	**1.11**	D
Benzo(a)pyrene	**12.1**	D	**1.06**	D
Benzo(b)fluoranthene	**13.9**	D	NE	
Benzo(k)fluoranthene	**8.99**	D	NE	
Chrysene	**14.8**	D	1.02	D
Dibenzo(a,h)anthracene	**4.24**	D	NE	
Indeno(1,2,3-cd)pyrene	**4.92**	D	**0.69**	D
PCBs (mg/kg)				
Total PCBs	NE		ND	
Pesticides (mg/kg)				
4,4'-DDD	0.0092	D	0.0040	D
4,4'-DDE	0.0157	DP	0.0076	D
4,4'-DDT	0.0483	D	0.0224	D
Dieldrin	0.0115	D	0.0055	D
Metals (mg/kg)				
Barium	**826**		NE	
Lead	**887**		108	
Mercury	0.45		NE	
Zinc	**10,900**	D	613	

Sample ID	SB09_1-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	1 to 2	
VOCs (mg/kg)		
Total VOCs	ND	
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.87**	D
Benzo(a)pyrene	**3.86**	D
Benzo(b)fluoranthene	**3.33**	D
Benzo(k)fluoranthene	2.96	D
Chrysene	**3.94**	D
Dibenzo(a,h)anthracene	**1.02**	D
Indeno(1,2,3-cd)pyrene	**2.49**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDD	0.0037	D
4,4'-DDE	0.0035	D
4,4'-DDT	0.0285	D
Dieldrin	0.0067	D
Metals (mg/kg)		
Barium	**842**	
Chromium, Hexavalent	4.19	
Lead	**465**	
Zinc	560	

Sample ID	SB06_0-1	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 1	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Indeno(1,2,3-cd)pyrene	**0.65**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDE	0.0039	D
4,4'-DDT	0.0072	D
Metals (mg/kg)		
Barium	**2,320**	
Chromium, Trivalent	30.5	
Copper	136	
Lead	**572**	
Mercury	0.48	
Nickel	30.9	
Zinc	1,300	

Sample ID	SB05_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.04**	D
Benzo(a)pyrene	**3.49**	D
Benzo(b)fluoranthene	**2.98**	D
Benzo(k)fluoranthene	2.82	D
Chrysene	3.11	D
Dibenzo(a,h)anthracene	**0.88**	D
Indeno(1,2,3-cd)pyrene	**2.48**	D
PCBs (mg/kg)		
Total PCBs	NE	
Pesticides (mg/kg)		
4,4'-DDE	0.0035	D
4,4'-DDT	0.0225	D
Metals (mg/kg)		
Barium	**648**	
Cadmium	2.94	
Copper	**454**	
Lead	**543**	
Mercury	0.31	
Zinc	715	

Sample ID	SB07_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**2.76**	D
Benzo(a)pyrene	**2.72**	D
Benzo(b)fluoranthene	**2.53**	D
Benzo(k)fluoranthene	1.87	D
Chrysene	2.89	D
Dibenzo(a,h)anthracene	**0.56**	D
Indeno(1,2,3-cd)pyrene	**1.52**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDT	0.0092	D
Metals (mg/kg)		
Barium	**9,060**	D
Cadmium	**5.09**	
Lead	**8,530**	D
Mercury	**1.24**	
Zinc	5,030	D

Sample ID	SB08_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.20**	D
Benzo(a)pyrene	**3.15**	D
Benzo(b)fluoranthene	**2.86**	D
Benzo(k)fluoranthene	2.44	D
Chrysene	3.27	D
Dibenzo(a,h)anthracene	**0.85**	D
Indeno(1,2,3-cd)pyrene	**2**	D
PCBs (mg/kg)		
Total PCBs	ND	
Pesticides (mg/kg)		
4,4'-DDT	0.0035	D
Metals (mg/kg)		
Lead	**766**	
Mercury	0.34	
Zinc	162	

Sample ID	SB01_0-2		SB01_5-6	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 2		5 to 6	
VOCs (mg/kg)				
Ethyl Benzene	1.40	D	ND	
Xylenes, Total	8.90	D	ND	
SVOCs (mg/kg)				
Benzo(a)anthracene	**2.15**	D	NE	
Benzo(a)pyrene	**2.23**	D	NE	
Benzo(b)fluoranthene	**1.81**	D	NE	
Benzo(k)fluoranthene	1.43	D	NE	
Chrysene	2.07	D	NE	
Dibenzo(a,h)anthracene	**0.53**	D	NE	
Indeno(1,2,3-cd)pyrene	**1.30**	D	NE	
PCBs (mg/kg)				
Total PCBs	ND		ND	
Pesticides (mg/kg)				
4,4'-DDT	0.0056	D	ND	
Metals (mg/kg)				
Lead	66.2		103	
Zinc	120		225	

Sample ID	SB03_0-2		SB03_5.5-6	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 2		5.5 to 6	
VOCs (mg/kg)				
Total VOCs	NE		ND	
SVOCs (mg/kg)				
Benzo(a)anthracene	**2.46**	D	NE	
Benzo(a)pyrene	**2.06**	D	NE	
Benzo(b)fluoranthene	**1.69**	D	NE	
Benzo(k)fluoranthene	1.42	D	NE	
Chrysene	2.25	D	NE	
Dibenzo(a,h)anthracene	**0.47**	D	NE	
Indeno(1,2,3-cd)pyrene	**1.04**	D	NE	
PCBs (mg/kg)				
Total PCBs	ND		ND	
Pesticides (mg/kg)				
4,4'-DDT	0.0185	D		
Metals (mg/kg)				
Barium	**3,200**		NE	
Cadmium	3.60		NE	
Chromium, Hexavalent	3.66		ND	
Lead	**1,070**		178	
Mercury	**7.43**		0.18	
Zinc	1,300		159	

Sample ID	SB04_0-2		SB04_6-7	
Sampling Date	2/15/2018		2/15/2018	
Sample Depth (ft bgs)	0 to 2		6 to 7	
VOCs (mg/kg)				
Total VOCs	NE		NE	
SVOCs (mg/kg)				
Benzo(a)anthracene	**4.28**	D	NE	
Benzo(a)pyrene	**3.76**	D	NE	
Benzo(b)fluoranthene	**3.35**	D	NE	
Benzo(k)fluoranthene	2.56	D	NE	
Chrysene	**4.12**	D	NE	
Dibenzo(a,h)anthracene	**0.91**	D	ND	
Indeno(1,2,3-cd)pyrene	**2.3**	D	NE	
PCBs (mg/kg)				
Total PCBs	ND		ND	
Pesticides (mg/kg)				
Total Pesticides	NE		ND	
Metals (mg/kg)				
Barium	**489**		NE	
Copper	59.6		NE	
Lead	142		NE	
Mercury	0.34		NE	
Zinc	364		NE	

Sample ID	SB10_0-2	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	0 to 2	
VOCs (mg/kg)		
Total VOCs	NE	
SVOCs (mg/kg)		
Benzo(a)anthracene	**4.17**	D
Benzo(a)pyrene	**4.41**	D
Benzo(b)fluoranthene	**4.21**	D
Benzo(k)fluoranthene	**3.97**	D
Chrysene	**4.31**	D
Dibenzo(a,h)anthracene	**1.42**	D
Indeno(1,2,3-cd)pyrene	**2.46**	D
PCBs (mg/kg)		
Total PCBs	0.259	
Pesticides (mg/kg)		
Total Pesticides	ND	
Metals (mg/kg)		
Barium	**662**	
Cadmium	**7.36**	
Copper	**349**	
Lead	**750**	
Mercury	**1.11**	
Zinc	994	

LEGEND:

- PROPOSED BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY
- SB02 — SOIL BORING LOCATION
- SB01/TMW01 — SOIL BORING AND TEMPORARY MONITORING WELL LOCATION

NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. SAMPLE LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
3. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO TITLE 6 OF THE NEW YORK CODES, RULES AND REGULATIONS (6 NYCRR) PART 375 UNRESTRICTED USE (UU) AND RESTRICTED USE RESTRICTED-RESIDENTIAL (RRU) SOIL CLEANUP OBJECTIVES (SCOs).
4. ONLY RESULTS ABOVE THE UU SCOs ARE SHOWN.
5. RESULTS EXCEEDING UU SCOs ARE SHADED.
6. RESULTS ABOVE RRU SCOS ARE SHADED AND BOLDED.
7. VOCs = VOLATILE ORGANIC COMPOUNDS
8. SVOCs = SEMIVOLATILE ORGANIC COMPOUNDS
9. PCBs = POLYCHLORINATED BIPHENYLS
10. ND = NO DETECTIONS
11. NE = RESULTS DID NOT EXCEED THE REGULATORY COMPARISON CRITERIA.
12. ft bgs = FEET BELOW GRADE SURFACE
13. mg/kg = MILLIGRAMS PER KILOGRAM
14. D = RESULT IS FROM AN ANALYSIS THAT REQUIRED DILUTION. SEE LABORATORY REPORTS FOR FURTHER DETAILS.

Analyte	6 NYCRR PART 375 UU SCOs	6 NYCRR PART 375 RRU SCOs
VOCs (mg/kg)		
Ethyl Benzene	1	41
Xylenes, Total	0.260	100
SVOCs (mg/kg)		
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	0.800	3.9
Chrysene	1	3.9
Dibenzo(a,h)anthracene	0.330	0.330
Indeno(1,2,3-cd)pyrene	0.500	0.500
PCBs (mg/kg)		
Total PCBs	0.100	1
Pesticides (mg/kg)		
4,4'-DDD	0.00330	13.0
4,4'-DDE	0.00330	8.9
4,4'-DDT	0.00330	7.9
Dieldrin	0.00500	0.2
Metals (mg/kg)		
Barium	350	400
Cadmium	2.5	4.3
Chromium, Hexavalent	1	110
Chromium, Trivalent	30	180
Copper	50	270
Lead	63	400
Mercury	0.180	0.81
Nickel	30	310
Zinc	109	10,000

30 0 15 30
SCALE IN FEET

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.

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

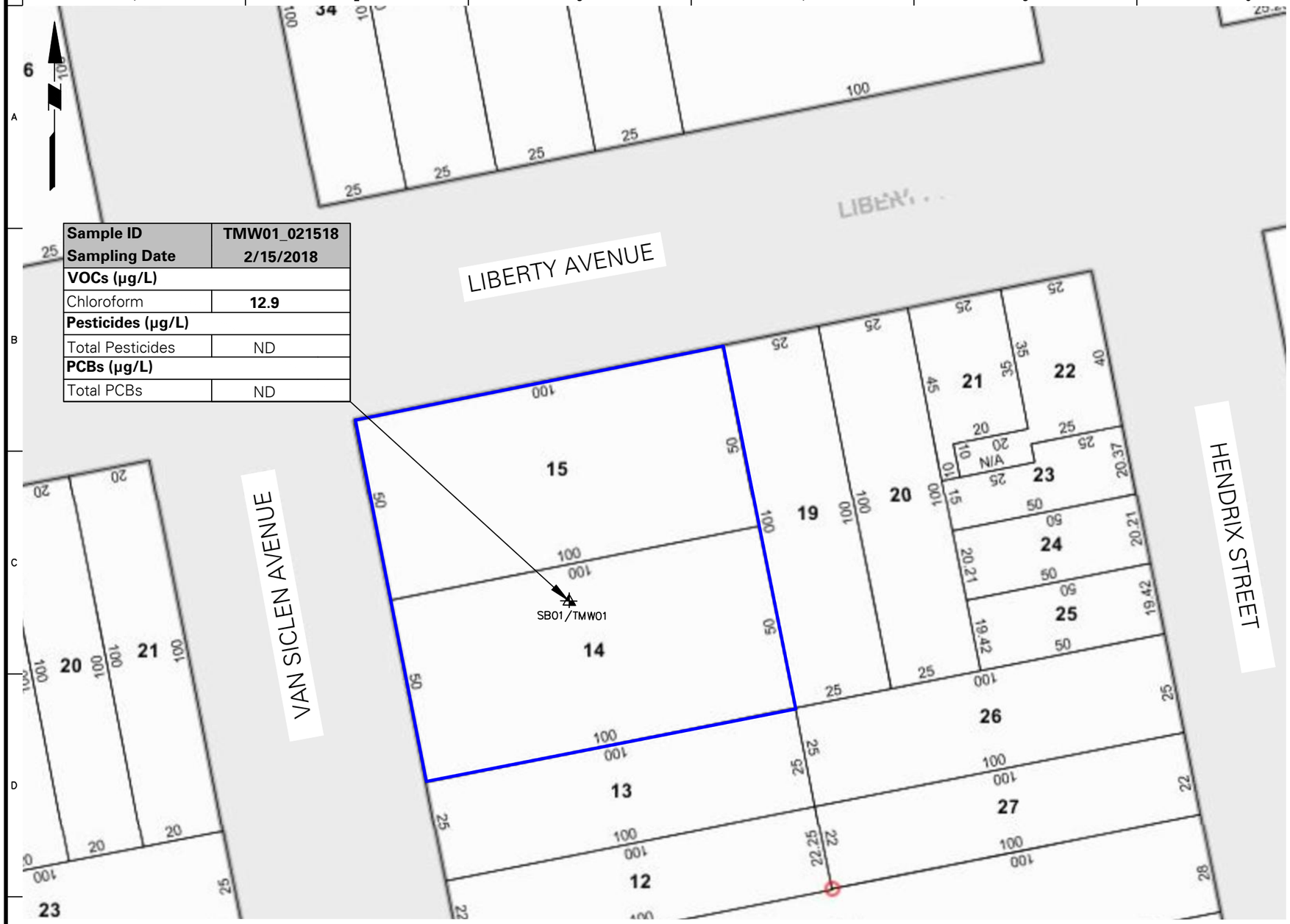
Project
203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

Figure Title
SOIL SAMPLE LOCATION AND RESULTS SUMMARY MAP

Project No. 170513001
Date 03/22/2018
Scale 1" = 30'
Drawn By ERA | Checked By KS
Submission Date APRIL 2018

Figure No. **C-1**
Sheet 1 of 3

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figures C-1-3- Sample Location Map.dwg Date: 10/17/2018 Time: 15:59 User: jarmstrong Style Table: Langan.stb Layout: C-1 Soil



Sample ID	TMW01_021518
Sampling Date	2/15/2018
VOCs (µg/L)	
Chloroform	**12.9**
Pesticides (µg/L)	
Total Pesticides	ND
PCBs (µg/L)	
Total PCBs	ND

LEGEND:

PROPOSED BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY

SB01/TMW01 SOIL BORING AND TEMPORARY MONITORING WELL LOCATION

NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. SAMPLE LOCATION IS APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
3. GROUNDWATER SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES (SGVs) FOR CLASS GA (DRINKING WATER).
4. ONLY RESULTS ABOVE NYSDEC TOGS SGVs ARE SHOWN.
5. COMPOUNDS EXCEEDING NYSDEC TOGS SGVs ARE SHOWN IN BOLD.
6. VOCs = VOLATILE ORGANIC COMPOUNDS
7. SVOCs = SEMIVOLATILE ORGANIC COMPOUNDS
8. PCBs = POLYCHLORINATED BIPHENYLS
9. ND = NO DETECTIONS
10. µg/L = MICROGRAMS PER LITER

Analyte	NYSDEC TOGS SGVs
VOCs (µg/L)	
Chloroform	7

30 0 15 30
SCALE IN FEET

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.

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
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Collectively known as Langan

Project: 203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

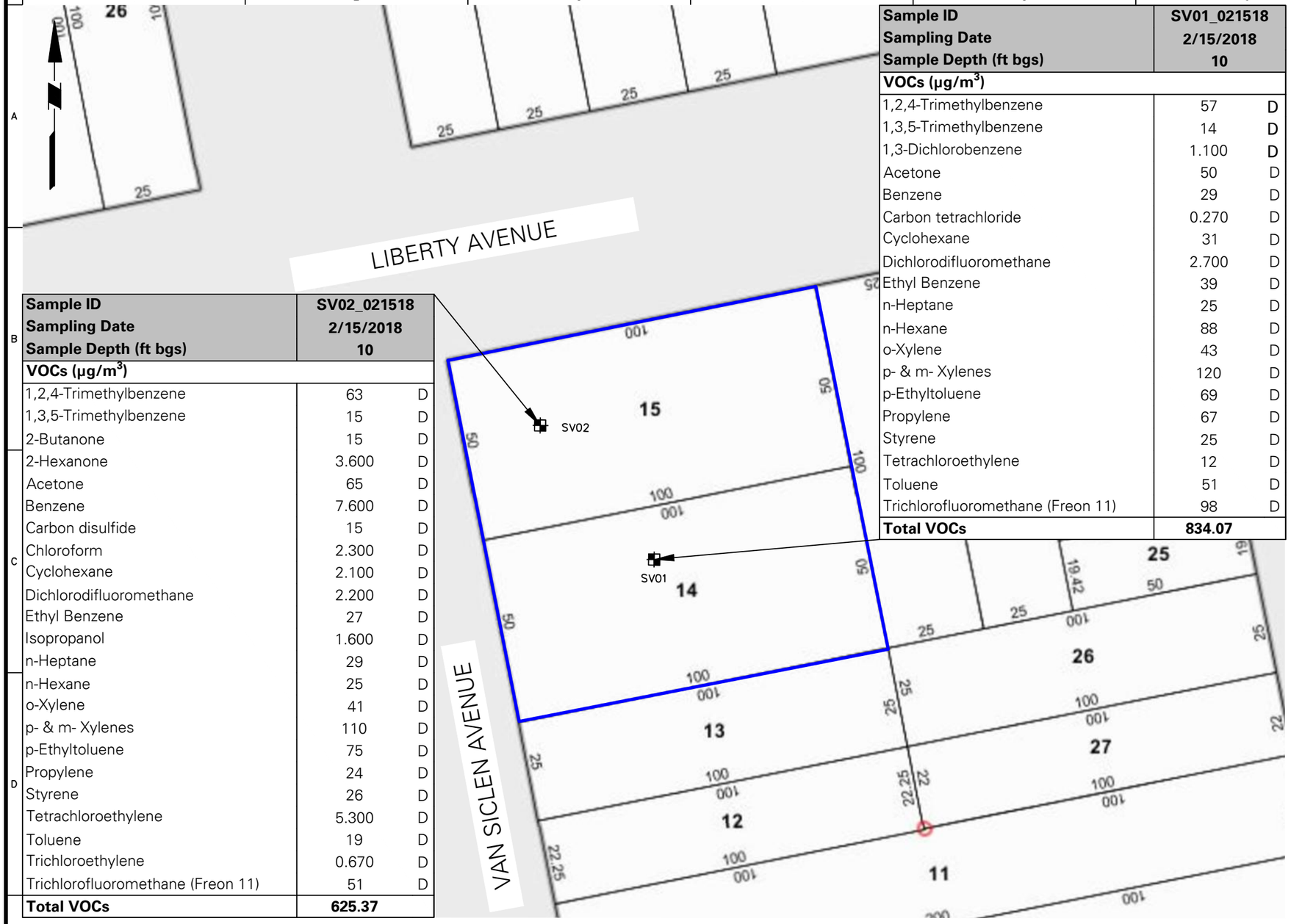
Figure Title: GROUNDWATER SAMPLE LOCATION AND RESULTS SUMMARY MAP

Project No. 170513001
Date 03/22/2018
Scale 1" = 30'
Drawn By ERA | Checked By KS
Submission Date APRIL 2018

Figure No. C-2

Sheet 2 of 3

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figures C-1-3- Sample Location Map.dwg Date: 11/9/2018 Time: 15:24 User: jarmstrong Style Table: Langan.stb Layout: C-2 GW



Sample ID	SV02_021518	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	10	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	63	D
1,3,5-Trimethylbenzene	15	D
2-Butanone	15	D
2-Hexanone	3.600	D
Acetone	65	D
Benzene	7.600	D
Carbon disulfide	15	D
Chloroform	2.300	D
Cyclohexane	2.100	D
Dichlorodifluoromethane	2.200	D
Ethyl Benzene	27	D
Isopropanol	1.600	D
n-Heptane	29	D
n-Hexane	25	D
o-Xylene	41	D
p- & m- Xylenes	110	D
p-Ethyltoluene	75	D
Propylene	24	D
Styrene	26	D
Tetrachloroethylene	5.300	D
Toluene	19	D
Trichloroethylene	0.670	D
Trichlorofluoromethane (Freon 11)	51	D
Total VOCs	**625.37**	

Sample ID	SV01_021518	
Sampling Date	2/15/2018	
Sample Depth (ft bgs)	10	
VOCs (µg/m³)		
1,2,4-Trimethylbenzene	57	D
1,3,5-Trimethylbenzene	14	D
1,3-Dichlorobenzene	1.100	D
Acetone	50	D
Benzene	29	D
Carbon tetrachloride	0.270	D
Cyclohexane	31	D
Dichlorodifluoromethane	2.700	D
Ethyl Benzene	39	D
n-Heptane	25	D
n-Hexane	88	D
o-Xylene	43	D
p- & m- Xylenes	120	D
p-Ethyltoluene	69	D
Propylene	67	D
Styrene	25	D
Tetrachloroethylene	12	D
Toluene	51	D
Trichlorofluoromethane (Freon 11)	98	D
Total VOCs	**834.07**	

LEGEND:

PROPOSED BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY

SB01/TMW01 SOIL VAPOR POINT LOCATION

NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. SAMPLE LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
3. SOIL VAPOR SAMPLE RESULTS WERE COMPARED TO THE LOWEST CONCENTRATION (ABSENT INDOOR AIR) THAT TRIGGER A MITIGATION RECOMMENDATION AS SHOWN IN THE NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH) SOIL VAPOR/INDOOR AIR MATRICES A, C, AN DC (REVISED MAY 2017).
4. ONLY DETECTED COMPOUNDS ARE SHOWN.
5. µg/m³ = MICROGRAMS PER CUBIC METER
6. VOCs = VOLATILE ORGANIC COMPOUNDS
7. D = RESULT IS FROM AN ANALYSIS THAT REQUIRED DILUTION. SEE LABORATORY REPORT FOR FURTHER DETAILS.
10. ft bgs = FEET BELOW GRADE SURFACE

VOC	NYSDOH DECISION MATRIX VALUES
Carbon tetrachloride	6
1,1-dichloroethene	6
cis-1,2-dichloroethene	6
Tetrachloroethene	100
1,1,1-trichloroethane	100
Trichloroethene	6
Vinyl chloride	6
Methylene chloride	100

30 0 15 30
SCALE IN FEET

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Project: 203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

Figure Title: SOIL VAPOR SAMPLE LOCATION AND RESULTS SUMMARY MAP

Project No. 170513001
Date 03/22/2018
Scale 1" = 30'
Drawn By ERA | Checked By KS
Submission Date APRIL 2018

Figure No. C-3
Sheet 3 of 3

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figures C-1-3- Sample Location Map.dwg Date: 11/9/2018 Time: 15:24 User: jarmstrong Style Table: Langan.stb Layout: C-3 SV

DUE DILLIGENCE REVIEW RECORDS

CLICK HERE TO SIGN UP FOR BUILDINGS NEWS

NYC Department of Buildings

Property Profile Overview

512 LIBERTY AVENUE **BROOKLYN 11207** **BIN# 3845348**

LIBERTY AVENUE 512 - 512

Tax Block : 3978
Tax Lot : 15

Community Board : 305

View DCP Addresses... Browse Block

View Zoning Documents | View Challenge Results | Pre - BIS PA | View Certificates of Occupancy

DOB Special Place Name:			
DOB Building Remarks:			
Landmark Status:		**Special Status:**	N/A
Local Law:	NO	**Loft Law:**	NO
SRO Restricted:	NO	**TA Restricted:**	NO
UB Restricted:	NO		
Environmental Restrictions:	HAZMAT/NOISE	**Grandfathered Sign:**	NO
Legal Adult Use:	NO	**City Owned:**	NO
Additional BINs for Building:	NONE		

Special District: UNKNOWN

This property is not located in an area that may be affected by Tidal Wetlands, Freshwater Wetlands, Coastal Erosion Hazard Area, or Special Flood Hazard Area. Click here for more information

Department of Finance Building Classification: Z9-MISCELLANEOUS

Please Note: The Department of Finance's building classification information shows a building's tax status, which may not be the same as the legal use of the structure. To determine the legal use of a structure, research the records of the Department of Buildings.

	Total	Open
Complaints	2	0
Violations-DOB	0	0
Violations-ECB (DOB)	5	0
Jobs/Filings	1	
ARA / LAA Jobs	0	
Total Jobs	1	
Total Actions	0	

OR Enter Action Type:

OR Select from List: Select...

AND Show Actions

Elevator Records
Electrical Applications
Permits In-Process / Issued
Illuminated Signs Annual Permits
Plumbing Inspections
Open Plumbing Jobs / Work Types
Facades
Marquee Annual Permits
Boiler Records
DEP Boiler Information
Crane Information
After Hours Variance Permits

If you have any questions please review these Frequently Asked Questions, the Glossary, or call the 311 Citizen Service Center by dialing 311 or (212) NEW YORK outside of New York City.

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Spill Incidents Database Search Details

Spill Record

Administrative Information

DEC Region: 2
Spill Number: 9601652

Spill Date/Time

Spill Date: 05/01/1996 **Spill Time:** 07:00:00 PM
Call Received Date: 05/02/1996 **Call Received Time:** 11:44:00 AM

Location

Spill Name: 522 LIBERTY AVE
Address: 522 LIBERTY AVE
City: BROOKLYN **County:** Kings

Spill Description

Material Spilled	Amount Spilled	Resource Affected
unknown material	UNKNOWN	Sewer
unknown hazardous material	UNKNOWN	Sewer
unknown petroleum	UNKNOWN	Sewer

Cause: Deliberate
Source: Commercial/Industrial
Waterbody:

Record Close

Date Spill Closed: 05/02/1996

"Date Spill Closed" means the date the spill case was closed by the case manager in the Department of Environmental Conservation (the Department). The spill case was closed because either; a) the records and data submitted indicate that the necessary cleanup and removal actions have been completed and no further remedial activities are necessary, or b) the case was closed for administrative reasons (e.g., multiple reports of a single spill consolidated into a single spill number). The Department however reserves the right to require additional remedial work in relation to the spill, if in the future it determines that further action is necessary.

If you have questions about this reported incident, please contact the Regional Office where the incident occurred.

Refine This Search

LIMITED SUBSURFACE INVESTIGATION RECORDS (ON CD)

ATTACHMENT D
SECTION IV: PROPERTY INFORMATION

Item 1 – Metes and Bounds Description

The 10,000-square-feet proposed BCP site is located at 203-207 Van Siclen Avenue, which corresponds with Brooklyn Tax Block 3978, Lots 14 and 15.

Item 2 – Property Maps

Figure D-1: Site Location Map is the required United States Geological Survey (USGS) 7.5-minute quadrangle map showing the location of the proposed BCP property.

Figure D-2: The Site Plan includes a 1,000-foot radius surrounding the proposed BCP property.

Figure D-3: Site Plan provides a property base map that shows map scale, north arrow orientation, date, and current New York City Tax Map boundaries with respect to the proposed BCP property boundary.

Figure D-4: Surrounding Land Use Map provides a property base map that shows proposed brownfield property boundary lines, with adjacent property owners and surrounding land uses clearly identified.

Item 3 – Environmental Zone

Based on the NYS Department of Labor's mapped boundaries for NYS Environmental Zones (En-Zones), 100 percent of the site is located within Census Tract 1152, which is within an En-zone. The site is located within a Type A En-Zone, which has a poverty rate of 20% and an unemployment rate of 125% of the statewide unemployment rate. This data satisfies En-Zone criteria pursuant to Tax Law 21(b)(6). Figure D-5 shows the property boundary inside of the En-Zone.

Item 10 - Property Description Narrative

Location

The site is within an urban setting and located at 203-207 Van Siclen Avenue in the East New York neighborhood of Brooklyn, New York, and is identified on the Tax Map as Block 3978, Lots 14 and 15. The 10,000-square-foot (0.23 acre) site is situated on the northwest corner of the block bound by Liberty Avenue to the north, Hendrix Street to the east, Glenmore Avenue to the south, and Van Siclen Avenue to the west. The surrounding area is comprised primarily of residential, commercial, and light-industrial buildings. Long Island Rail Road (LIRR) tracks run east-west below Atlantic Avenue, about 425 feet north of the site.

Site Features

The 10,000-square-foot (0.23 acre) site is currently used for storage of construction equipment, but with no permanent structures/buildings. Mostly soil covers the site with isolated patches of low vegetation and gravel. Historical Sanborn fire insurance maps did not indicate the presence of underground storage tanks (UST) within the proposed BCP site. No indications of aboveground storage tanks (ASTs) or USTs were observed during the February 2018 limited subsurface investigation.

Current Zoning and Land Use

According to the on-line New York City's Zoning and Land Use Map, the site is located within a Special Mixed Use Paired District (M1-4/R6A). This paired district promotes development and expansion of the longstanding mix of residential, commercial, industrial, and cultural use throughout the area. M1 districts typically include retail and light industrial uses such as woodworking shops, repair shops, and wholesale service and storage facilities, and R6A districts promote residential development. Zoning is consistent with the proposed residential development. The surrounding area is primarily residential and industrial, but also includes commercial buildings, public facilities, day care centers, and schools.

As a result of the CEQR process, Block 3978 Lots 14 and 15 were assigned an E-Designation (E-366) on April 20, 2016 by the New York City Department of City Planning (NYCDCP) as part of the East New York rezoning (CEQR No. 15DCP102K). The E-Designation requires coordination with the New York City Office of Environmental Remediation (NYCOER) to obtain a Notice to Proceed (NTP) or a Notice of No Objection (NNO) prior to obtaining building permits. The E-Designation addresses environmental requirements for Hazardous Materials and Noise (window wall attenuation and alternative means of ventilation) during development.

Past Use of the Site

The site is currently used for storage of construction equipment. Prior to about May 2017, the site was used for storage and maintenance of automobiles.

Sanborn® Fire Insurance Maps from 1887 to 2007 were reviewed. As early as 1887, the site was divided into four adjoining tax lots and occupied by one 2-story dwelling with a basement. By 1908, the site was vacant and unimproved. From at least 1928 to 1966, the site was occupied by a 4-story residential building with a store. By 1977, Lot 14 was vacated and unimproved; and the entire site was vacated and unimproved by 1981.

Spill No. 9601652 was reported at 522 Liberty Avenue (an alternate address for the 203-207 Van Siclen Avenue site) on May 1, 1996 when the New York Police Department (NYPD) executed a search warrant for an illegal chop shop and discovered the site contaminated with various chemicals, oils, and other unknown materials. Spill case notes indicated that unknown

amounts of unknown material, unknown hazardous material, and unknown petroleum were spilled across the surface of the site. The spill was closed on May 2, 1996; but no available information pertinent to the remediation is available.

Site Geology and Hydrogeology

Based on findings from the February 2018 Limited Subsurface Investigation by Langan, the site is underlain by fill material predominantly consisting of brown sand with varying amounts gravel, silt, concrete, brick, coal, steel fragments, and glass and other debris. The fill extended to a depth between 5 and 16 feet below grade surface in each of the 10 borings advanced at the site. Native deposits encountered beneath the historical fill material predominantly consists of fine- to coarse-grained sand with varying amounts silt and fine gravel. Bedrock was not encountered during the Limited Subsurface Investigation.

Groundwater was encountered at about 38 feet below grade surface (bgs). Based on the surface topography of the site and surrounding area, the assumed regional groundwater flow direction is to the south towards Jamaica Bay.

Environmental Assessment

Based on the February 2018 Limited Subsurface Investigation, the primary contaminants of concern include the following compounds detected in soil: Petroleum-related volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), pesticides, metals, and polychlorinated biphenyls (PCBs). Results of soil, groundwater, and soil vapor samples are summarized below.

Soil –

- (VOCs were detected above the NYSDEC Part 375 Unrestricted Use (UU) Soil Cleanup Objectives (SCOs) in 1 of the 14 soil samples, but Restricted Use Restricted-Residential (RRU) SCOs were not exceeded. The UU SCOs are indicated in parentheses.
    - Ethylbenzene – 1.40 milligrams per kilogram (mg/kg) in SB01_0-2 (1 mg/kg)
    - Total Xylenes – 8.90 mg/kg in SB01_0-2 (0.26 mg/kg)

- Semivolatile Organic Compounds (SVOCs) were detected above NYSDEC Part 375 UU and/or RRU SCOs in 11 of the 14 soil samples. The SCOs are indicated in parentheses.
    - Benzo(a)anthracene – from 1.11 mg/kg in SB02_7-8 to 14.3 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)
    - Benzo(a)pyrene – from 1.06 mg/kg in SB02_7-8 to 12.10 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)
    - Benzo(b)fluoranthene – from 1.69 mg/kg in SB03_0-2 to 13.9 mg/kg in SB02_0-1 (UU and RRU SCO of 1 mg/kg)

  - Benzo(k)fluoranthene – from 1.42 mg/kg in SB03_0-2 to 8.99 mg/kg in SB02_0-1 (UU SCO of 0.8 mg/kg and RRU SCO of 3.9 mg/kg)
  - Chrysene – from 1.02 mg/kg in SB02_7-8 to 14.80 mg/kg in SB02_0-1 (UU SCO of 1 mg/kg and RRU SCO of 3.9 mg/kg)
  - Dibenzo(a,h)anthracene – from 0.47 mg/kg in SB03_0-2 to 4.24 mg/kg in SB02_0-1 (UU and RRU SCO of 0.330 mg/kg)
  - Indeno(1,2,3-cd)pyrene – from 0.65 mg/kg in SB06_0-1 to 4.92 mg/kg in SB02_0-1 (UU and RRU SCO of 0.5 mg/kg)

- Pesticides were detected above NYSDEC Part 375 UU SCO in 9 of the 14 soil samples, but RRU SCOs were not exceeded. The UU SCOs are indicated in parentheses.
  - 4,4'-DDD – from 0.0037 mg/kg in SB09_1-2 to 0.0092 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - 4,4'-DDE – from 0.0035 mg/kg in SB05_0-2 and SB09_1-2 to 0.0157 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - 4,4'-DDT – from 0.0035 mg/kg in SB08_0-2 to 0.0483 mg/kg in SB02_0-1 (0.0033 mg/kg)
  - Dieldrin – from 0.0055 mg/kg in SB02_7-8 to 0.0115 mg/kg in SB02_0-1 (0.005 mg/kg)

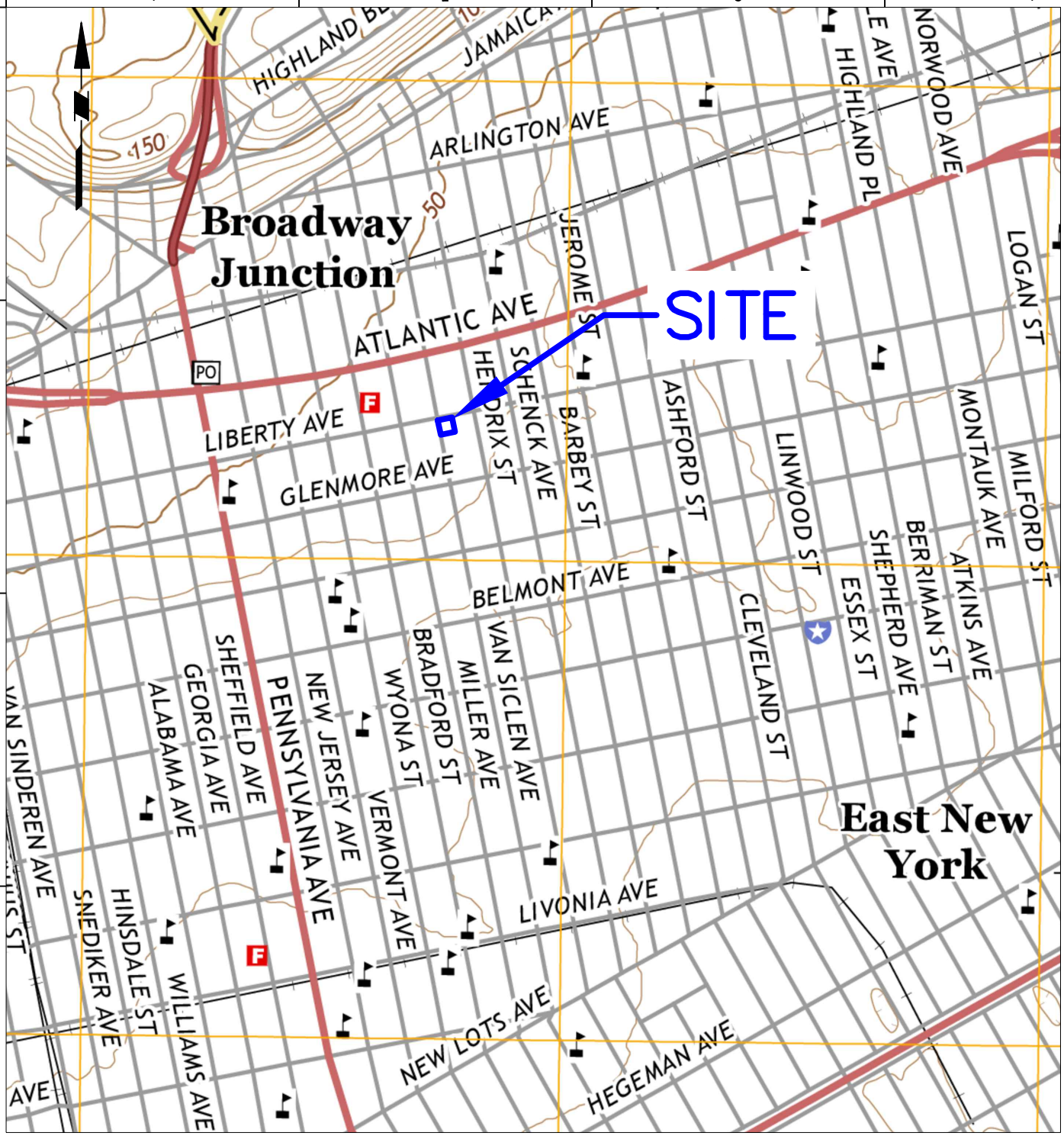
- Metals were detected above NYSDEC Part 375 UU and/or RRU SCOs in 13 of the 14 soil samples. The SCOs are indicated in parentheses.
  - Barium – from 489 mg/kg in SB04_0-2 to 9,060 mg/kg in SB07_0-2 (UU SCO of 350 mg/kg and RRU SCO of 400 mg/kg)
  - Cadmium – from 2.94 mg/kg in SB05_0-2 to 7.36 mg/kg in SB10_0-2 (UU SCO of 2.5 mg/kg and RRU SCO of 4.3 mg/kg)
  - Chromium (Hexavalent) – from 3.66 mg/kg in SB03_0-2 and 4.19 mg/kg in SB09_1-2 (UU SCO of 1 mg/kg)
  - Chromium (Trivalent) – 30.5 mg/kg in SB06_0-1 (UU SCO of 30 mg/kg)
  - Copper – from 59.6 mg/kg in SB04_0-2 to 454 mg/kg in SB05_0-2 (UU SCO of 50 mg/kg and RRU SCO of 270 mg/kg)
  - Lead – from 66.2 mg/kg in SB01_0-2 to 8,530 mg/kg in SB07_0-2 (UU SCO of 63 mg/kg and RRU SCO of 400 mg/kg)
  - Mercury – from 0.18 mg/kg in SB03_5.5-6 to 7.43 mg/kg in SB03_0-2 (UU SCO of 0.18 mg/kg and RRU SCO of 0.81 mg/kg)
  - Nickel – 30.9 mg/kg in SB06_0-1 (UU SCO of 30 mg/kg)
  - Zinc – from 120 mg/kg in SB01_0-2 to 10,900 mg/kg in SB02_0-1 (UU SCO of 109 mg/kg and RRU SCO of 10,000 mg/kg)

- PCBs were detected above NYSDEC Part 375 UU in 1 of the 14 soil samples. The SCOs are indicated in parentheses.
    - Total PCBs (Aroclors 1248 and 1260) – 0.259 mg/kg in SB10_0-2 (UU SCO of 0.1 mg/kg)

Groundwater – The VOC chloroform was detected in groundwater at a concentration of 12.9 micrograms per liter (µg/L), above the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Value (SGV) of 7 µg/L. Chloroform is common byproduct of disinfection of municipal drinking water with chlorine, and is not indicative of on-site impacts. Other VOCs including tetrachloroethene (PCE) and trichloroethylene (TCE) were detected in groundwater samples, but at concentrations below the NYSDEC TOGS SGVs.

Soil Vapor – The New York State Department of Health (NYSDOH) provides decision matrices for eight chlorinated VOCs (carbon tetrachloride, 1,1-dichloroethene, cis-1,2-dichloroethene, TCE, methylene chloride, PCE, 1,1,1-trichloroethane, and vinyl chloride). The decision matrices recommend a range of activities (e.g., monitor, mitigate) based on the concentrations of these compounds in soil vapor when compared to indoor air. In the absence of indoor air samples, soil vapor results were compared to the lowest concentration that triggers a mitigation recommendation, as specified in the NYSDOH guidance document. Soil vapor concentrations did not exceed the minimum NYSDOH decision matrix values for which mitigation is recommended. Other VOCs, not included in the matrices, were also detected at concentrations of 625 µg/m^3 and 834 µg/m^3.

FIGURES



NOTES:

1. BASE MAPS ADAPTED FROM UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5-MINUTE BROOKLYN (NEW YORK) TOPOGRAPHIC QUADRANGLE, DATED 2016.

1000 0 500 1000

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21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
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Project

203-207 VAN SICLEN AVENUE

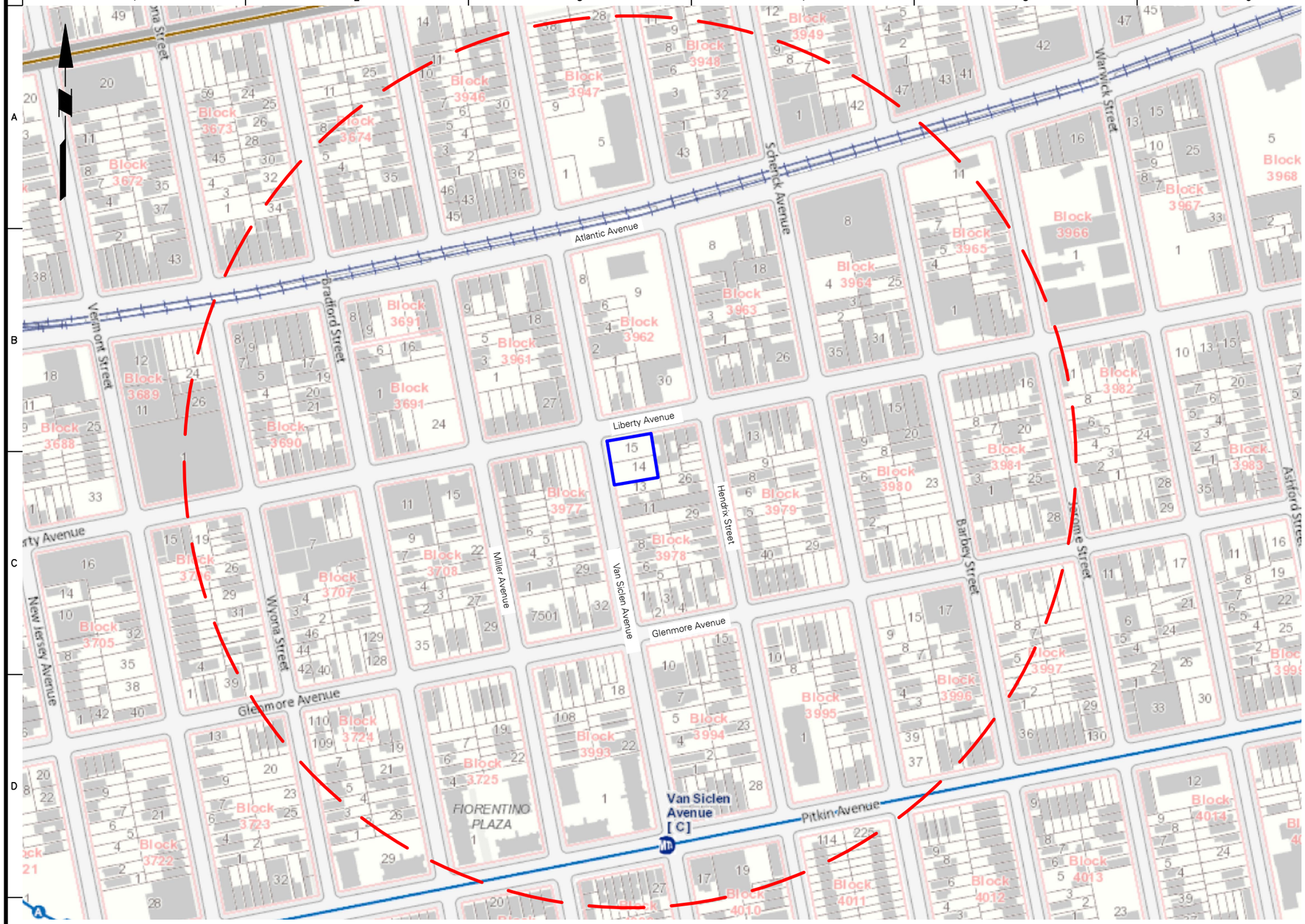
BLOCK No. 3978, LOT Nos. 14 AND 15

BROOKLYN NEW YORK

Figure Title

SITE LOCATION MAP

Project No. 170513001	Figure No. D-1
Date 03/20/2017	
Scale 1"=1000'	
Drawn By ERA / Checked By KS	
Submission Date APRIL 2017	Sheet 1 of 5



LEGEND:

PROPOSED BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY

1000-FOOT RADIUS BOUNDARY

NOTES:

1. BASEMAP ACCESSED FROM NYC OASIS (http://www.oasisnyc.net/map.aspx) ON MARCH 21, 2018.

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BLOCK No. 3978, LOT Nos. 14 AND 15

BROOKLYN **NEW YORK**

Figure Title

SITE MAP 1000-FOOT RADIUS

Project No. 170513001	Figure No. D-2
Date 03/21/2018	
Scale 1" = 250'	
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Submission Date APRIL 2018	Sheet 2 of 5

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figure D-2 - 1000 Foot Radius.dwg Date: 3/22/2018 Time: 13:35 User: eadkins Style Table: Langan.stb Layout: ANSIB-BL

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PROPOSED BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY

NOTES:

1. BASEMAP ACCESSED FROM NYC TAX MAP (http://maps.nyc.gov/taxmap/map.htm) ON MARCH 21, 2018.

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203-207 VAN SICLEN AVENUE

BLOCK No. 3978, LOT Nos. 14 AND 15

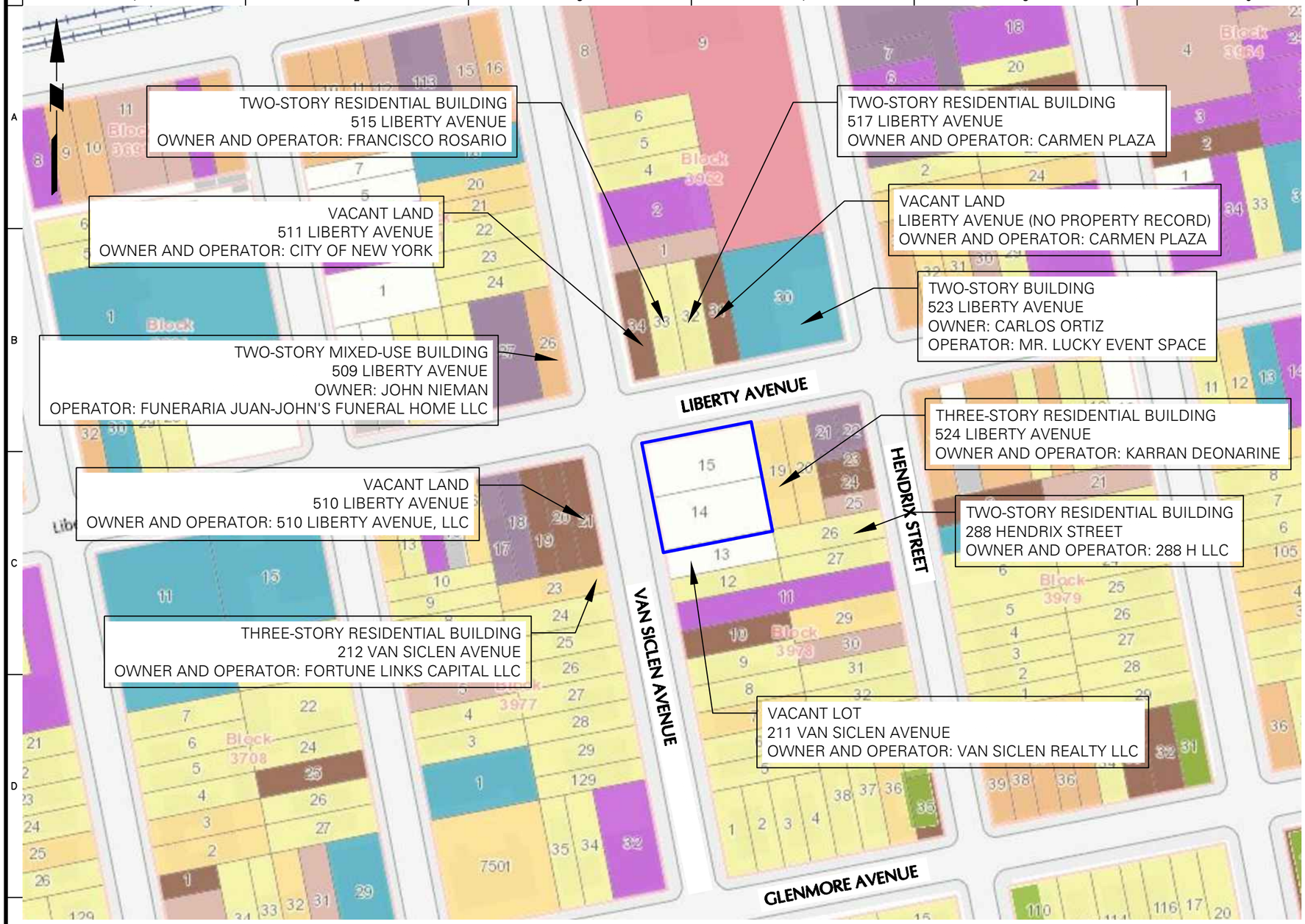
BROOKLYN **NEW YORK**

Figure Title

TAX BLOCK AND LOT MAP

Project No. 170513001	Figure No. D-3
Date 03/21/2018	
Scale 1" = 30'	
Drawn By ERA / Checked By KS	
Submission Date APRIL 2018	Sheet 3 of 5

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figure D-3 - Tax Map.dwg Date: 3/22/2018 Time: 13:37 User: eadkins Style Table: Langan.stb Layout: ANSIB-BL



LEGEND:

- PROPOSED BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY
- 1 & 2 FAMILY RESIDENTIAL
- MULTI-FAMILY RESIDENTIAL
- MIXED USE
- OPEN SPACE & OUTDOOR RECREATION
- COMMERCIAL
- INSTITUTIONS
- INDUSTRIAL
- PARKING
- TRANSPORTATION/UTILITIES
- VACANT LOTS

NOTES:

1. BASEMAP ACCESSED FROM NYC OASIS (http://www.oasisnyc.net/map.aspx) ON MARCH 21, 2018.

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203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
BROOKLYN NEW YORK

Figure Title
SURROUNDING LAND USE MAP

Project No. 170513001	Figure No. D-4
Date 03/21/2018	
Scale 1" = 100'	
Drawn By ERA / Checked By KS	
Submission Date APRIL 2018	Sheet 4 of 5

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figure D-4 - Surrounding Land Use Map.dwg Date: 3/22/2018 Time: 13:44 User: eadkins Style Table: Langan.stb Layout: ANSIB-BL

LEGEND:

- PROPOSED BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY
- MEETS ELIGIBILITY CRITERIA A, WHICH IS DEFINED AS A POVERTY RATE OF AT LEAST 20 PERCENT AND AN UNEMPLOYMENT RATE OF AT LEAST 125 PERCENT OF THE STATEWIDE UNEMPLOYMENT RATE
- APPROXIMATE BOUNDARY OF CENSUS TRACT 1152

NOTES:

1. BASEMAP IS SOURCED FROM NEW YORK STATE (NYS) ENVIRONMENTAL ZONES (EN-ZONES) BOUNDARY MAP DEVELOPED BY NYS DEPARTMENT OF LABOR, MADE AVAILABLE BY THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S DIVISION OF ENVIRONMENTAL REMEDIATION.

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203-207 VAN SICLEN AVENUE
BLOCK No. 3978, LOT Nos. 14 AND 15
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Figure Title
ENVIRONMENTAL ZONE MAP

Project No. 170513001	Figure No. D-5
Date 03/21/2018	
Scale 1" =250'	
Drawn By ERA / Checked By KS	
Submission Date APRIL 2018	Sheet 5 of 5

Filename: \\langan.com\data\NYC\data0\170513001\Project Data\CAD\01\SheetFiles\Environmental\BCP Application\Figure D-5 - Environmental Zone Map.dwg Date: 5/31/2018 Time: 10:01 User: ksimmons Style Table: Langan.stb Layout: ANSIB-BL

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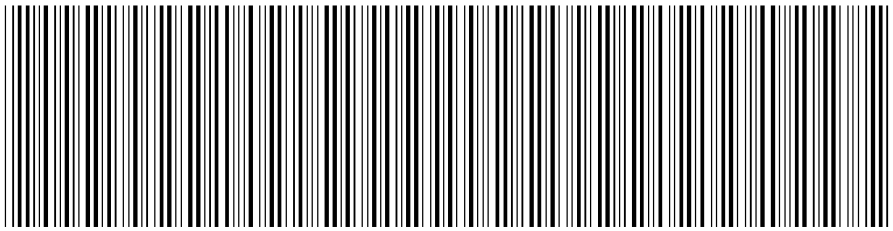

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RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 4**

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Document Page Count: 3

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7811 15TH AVENUE
PICK UP MIKE N.
BROOKLYN, NY 11228
718-232-0990
DIANER@CORNERSTONE-SETTLEMENT.COM

RETURN TO:
CORNERSTONE SETTLEMENT SERVICES, INC.
7811 15TH AVENUE
PICK UP MIKE N.
BROOKLYN, NY 11228
718-232-0990
DIANER@CORNERSTONE-SETTLEMENT.COM

PROPERTY DATA

Borough	Block	Lot	Unit	Address
BROOKLYN	3978	14	Entire Lot	207 VAN SICLEN AVENUE

Property Type: OTHER

CROSS REFERENCE DATA

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

PARTIES

GRANTOR/SELLER:
ADOLFO CANO
203-211 VAN SICLEN AVENUE
BROOKLYN, NY 11207

GRANTEE/BUYER:
VAN SICLEN REALTY LLC
203-211 VAN SICLEN AVENUE
BROOKLYN, NY 11207

FEES AND TAXES

Mortgage :

Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	52.00
Affidavit Fee:	$	0.00

Filing Fee: $ 250.00

NYC Real Property Transfer Tax: $ 0.00

NYS Real Estate Transfer Tax: $ 0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 07-03-2017 10:15
City Register File No.(CRFN): **2017000243835**

City Register Official Signature

NY005 - Bargain and Sale Deed with Covenant against Grantor's Acts Individual or Corporation (Single Sheet) (NYBTU 8002)

CONSULT YOUR LAWYER BEFORE SIGNING THIS INSTRUMENT – THIS INSTRUMENT SHOULD BE USED BY LAWYERS ONLY

THIS INDENTURE, made the 03rd day of ~~April~~ May, in the year 2017

BETWEEN ADOLFO CANO, residing at 545 Glenmore Avenue, 1st Fl, Brooklyn, New York 11207

party of the first part, and VAN SICLEN REALTY LLC, with offices at 60 Lyman Place Staten Island NY 10304

party of the second part,

WITNESSETH, that the party of the first part, in consideration of Ten Dollars and other valuable consideration paid by the party of the second part, does hereby grant and release unto the party of the second part, the heirs or successors and assigns of the party of the second part forever,

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the

"SEE ATTACHED SCHEDULE A"

Tax Map Designation

Dist.

Sec.

Blk. 3978

Lot(s) 14

TOGETHER with all right, title and interest, if any, of the party of the first part of, in and to any streets and roads abutting the above-described premises to the center lines thereof; **TOGETHER** with the appurtenances and all the estate and rights of the party of the first part in and to said premises; **TO HAVE AND TO HOLD** the premises herein granted unto the party of the second part, the heirs or successors and assigns of the party of the second part forever.

AND the party of the first part covenants that the party of the first part has not done or suffered anything whereby the said premises have been incumbered in any way whatever, except as aforesaid.

AND the party of the first part, in compliance with Section 13 of the Lien Law, covenants that the party of the first part will receive the consideration for this conveyance and will hold the right to receive such consideration as a trust fund to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

The word "party" shall be construed as if it read "parties" whenever the sense of this indenture so requires.

IN WITNESS WHEREOF, the party of the first part has duly executed this deed the day and year first above written.

IN PRESENCE OF:

USE ACKNOWLEDGMENT FORM BELOW UNLESS

State of New York, County of KINGS } ss.:

On the 3rd day of ~~April~~ May in the year 2017
before me, the undersigned, personally appeared ADOLFO CANO

personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

NANCY L CUCUZZA
Notary Public, State of New York
No. 01CU6019220
Qualified in Richmond County
Commission Expires February 1, 2019

ACKNOWLEDGMENT FORM FOR USE WITHIN NEW YORK STATE ONLY:
(New York Subscribing Witness Acknowledgment Certificate)

State of New York, County of } ss.:

On the day of in the year
before me, the undersigned, personally appeared

the subscribing witness to the foregoing instrument, with whom I am personally acquainted, who, being by me duly sworn, did depose and say that he/she/they reside(s) in

(if the place of residence is in a city, include the street and street number, if any, thereof); that he/she/they know(s)

to be the individual described in and who executed the foregoing instrument; that said subscribing witness was present and saw said

execute the same; and that said witness at the same time subscribed his/her/their name(s) as a witness thereto.

State of New York, County of } ss.

On the day of in the year
before me, the undersigned, personally appeared

personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

ACKNOWLEDGMENT FORM FOR USE OUTSIDE NEW YORK STATE ONLY:
(Out of State or Foreign General Acknowledgment Certificate)

..... } ss.:
(Complete Venue with State, Country, Province or Municipality)

On the day of in the year
before me, the undersigned, personally appeared

personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), that by his/her/ their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument, and that such individual made such appearance before the undersigned in the

(Insert the city or other political subdivision and the state or country or other place the acknowledgment was taken).

BARGAIN & SALE DEED
WITH COVENANTS AGAINST GRANTOR'S ACTS

TITLE NO.

ADOLFO CANO,

TO

VAN SICLEN REALTY LLC,

DISTRICT
SECTION
BLOCK 3978
LOT 54,
COUNTY OR TOWN KINGS

FIDELITY NATIONAL TITLE INSURANCE COMPANY OF NEW YORK
INCORPORATED 1928
"Affiliates do Fidelity Differences"
Member New York State Land Title Association

RECORDED AT REQUEST OF
Fidelity National Title Insurance Company of New York
RETURN BY MAIL TO

LUGARA PLLC
7811 15th Avenue
Brooklyn, New York 11228

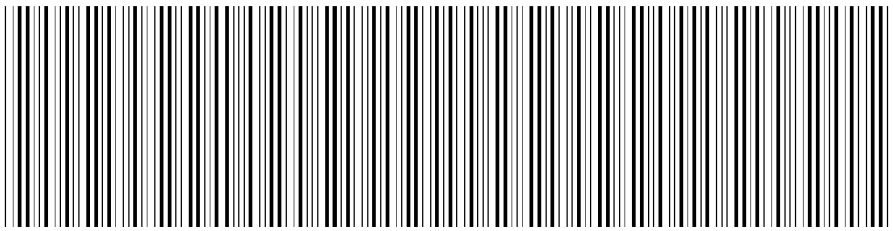
RESERVE THIS SPACE FOR USE OF RECORDING OFFICE

Schedule A Description

ALL that certain plot, piece or parcel of land situate lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, known and designated as Block: 3978 Lot: 13 on the Tax Map of 5/27/1981, Block 3978, Lot 14 on the Tax Map of 02/11/1975, Block 3978 Lot 15 on the Tax Map of 01/17/1978 of the Borough of Brooklyn.

Said premises being known as: 203-207-211 Van Siclen Avenue, Brooklyn, New York

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER



2017062801288001002S087D

SUPPORTING DOCUMENT COVER PAGE **PAGE 1 OF 1**

Document ID: 2017062801288001 Document Date: 05-03-2017 Preparation Date: 06-30-2017
Document Type: DEED

ASSOCIATED TAX FORM ID: 2017062800282

SUPPORTING DOCUMENTS SUBMITTED:

	Page Count
RP - 5217 REAL PROPERTY TRANSFER REPORT	4

FOR CITY USE ONLY

C1. County Code | | C2. Date Deed Recorded | / / | Month Day Year

C3. Book OR C5. CRFN | | C4. Page | |

REAL PROPERTY TRANSFER REPORT

STATE OF NEW YORK
STATE BOARD OF REAL PROPERTY SERVICES

RP - 5217NYC

PROPERTY INFORMATION

1. Property Location: 207 (STREET NUMBER) | VAN SICLEN AVENUE (STREET NAME) | BROOKLYN (BOROUGH) | 11207 (ZIP CODE)

2. Buyer Name: VAN SICLEN REALTY LLC (LAST NAME / COMPANY) | (FIRST NAME)

(LAST NAME / COMPANY) | (FIRST NAME)

3. Tax Billing Address: Indicate where future Tax Bills are to be sent if other than buyer address (at bottom of form) (LAST NAME / COMPANY) | (FIRST NAME)

(STREET NUMBER AND STREET NAME) | (CITY OR TOWN) | (STATE) | (ZIP CODE)

4. Indicate the number of Assessment Roll parcels transferred on the deed: 1 # of Parcels OR ☐ Part of a Parcel

4A. Planning Board Approval - N/A for NYC

4B. Agricultural District Notice - N/A for NYC

5. Deed Property Size: (FRONT FEET) X (DEPTH) OR (ACRES)

Check the boxes below as they apply:

6. Ownership Type is Condominium ☐

7. New Construction on Vacant Land ☐

8. Seller Name: CANO (LAST NAME / COMPANY) | ADOLFO (FIRST NAME)

(LAST NAME / COMPANY) | (FIRST NAME)

9. Check the box below which most accurately describes the use of the property at the time of sale:

A ☐ One Family Residential
B ☐ 2 or 3 Family Residential
C ☐ Residential Vacant Land
D ☐ Non-Residential Vacant Land
E ☑ Commercial
F ☐ Apartment
G ☐ Entertainment / Amusement
H ☐ Community Service
I ☐ Industrial
J ☐ Public Service

SALE INFORMATION

10. Sale Contract Date: 5 / 3 / 2017 (Month Day Year)

11. Date of Sale / Transfer: 5 / 3 / 2017 (Month Day Year)

12. Full Sale Price $ 0

(Full Sale Price is the total amount paid for the property including personal property. This payment may be in the form of cash, other property or goods, or the assumption of mortgages or other obligations.) *Please round to the nearest whole dollar amount.*

13. Indicate the value of personal property included in the sale

14. Check one or more of these conditions as applicable to transfer:

A ☐ Sale Between Relatives or Former Relatives
B ☐ Sale Between Related Companies or Partners in Business
C ☐ One of the Buyers is also a Seller
D ☐ Buyer or Seller is Government Agency or Lending Institution
E ☐ Deed Type **not** Warranty or Bargain and Sale (Specify Below)
F ☐ Sale of Fractional or Less than Fee Interest (Specify Below)
G ☐ Significant Change in Property Between Taxable Status and Sale Dates
H ☐ Sale of Business is Included in Sale Price
I ☐ Other Unusual Factors Affecting Sale Price (Specify Below)
J ☑ None

ASSESSMENT INFORMATION - Data should reflect the latest Final Assessment Roll and Tax Bill

15. Building Class: Z 9

16. Total Assessed Value (of all parcels in transfer): 8 1 0 0 0

17. Borough, Block and Lot / Roll Identifier(s) (If more than three, attach sheet with additional identifier(s))

BROOKLYN 3978 14

2017062800282201 01

CERTIFICATION

I certify that all of the items of information entered on this form are true and correct (to the best of my knowledge and belief) and understand that the making of any willful false statement of material fact herein will subject me to the provisions of the penal law relative to the making and filing of false instruments.

BUYER

BUYER SIGNATURE | DATE: 5/3/2017

203-211 VAN SICLEN AVENUE

STREET NUMBER | STREET NAME (AFTER SALE)

BROOKLYN | NY | 11207

CITY OR TOWN | STATE | ZIP CODE

BUYER'S ATTORNEY

LAST NAME | FIRST NAME

AREA CODE | TELEPHONE NUMBER

SELLER

SELLER SIGNATURE | DATE: 5/3/2017

2017041900016201

FOR CITY USE ONLY

C1. County Code ____ C2. Date Deed Recorded ____ / ____ / ____ (Month / Day / Year)

C3. Book OR C4. Page ____

C5. CRFN ____

REAL PROPERTY TRANSFER REPORT

STATE OF NEW YORK
STATE BOARD OF REAL PROPERTY SERVICES

RP - 5217NYC

PROPERTY INFORMATION

1. Property Location: 207 (STREET NUMBER) | VAN SICLEN AVENUE (STREET NAME) | BROOKLYN (BOROUGH) | 11207 (ZIP CODE)

2. Buyer Name: VAN SICLEN REALTY LLC (LAST NAME / COMPANY) | (FIRST NAME)

(LAST NAME / COMPANY) | (FIRST NAME)

3. Tax Billing Address: Indicate where future Tax Bills are to be sent if other than buyer address (at bottom of form) (LAST NAME / COMPANY) | (FIRST NAME)

(STREET NUMBER AND STREET NAME) | (CITY OR TOWN) | (STATE) | (ZIP CODE)

4. Indicate the number of Assessment Roll parcels transferred on the deed: 1 # of Parcels OR ☐ Part of a Parcel

4A. Planning Board Approval - N/A for NYC

4B. Agricultural District Notice - N/A for NYC

5. Deed Property Size: ____ (FRONT FEET) X ____ (DEPTH) OR ____ (ACRES)

Check the boxes below as they apply:

6. Ownership Type is Condominium ☐

7. New Construction on Vacant Land ☐

8. Seller Name: CANO (LAST NAME / COMPANY) | ADOLFO (FIRST NAME)

(LAST NAME / COMPANY) | (FIRST NAME)

9. Check the box below which most accurately describes the use of the property at the time of sale:

A ☐ One Family Residential
B ☐ 2 or 3 Family Residential
C ☐ Residential Vacant Land
D ☐ Non-Residential Vacant Land
E ☑ Commercial
F ☐ Apartment
G ☐ Entertainment / Amusement
H ☐ Community Service
I ☐ Industrial
J ☐ Public Service

SALE INFORMATION

10. Sale Contract Date: 5 / 3 / 2017 (Month / Day / Year)

11. Date of Sale / Transfer: 5 / 3 / 2017 (Month / Day / Year)

12. Full Sale Price $ 0

(Full Sale Price is the total amount paid for the property including personal property. This payment may be in the form of cash, other property or goods, or the assumption of mortgages or other obligations.) *Please round to the nearest whole dollar amount.*

13. Indicate the value of personal property included in the sale ____

14. Check one or more of these conditions as applicable to transfer:

A ☐ Sale Between Relatives or Former Relatives
B ☐ Sale Between Related Companies or Partners in Business
C ☐ One of the Buyers is also a Seller
D ☐ Buyer or Seller is Government Agency or Lending Institution
E ☐ Deed Type **not** Warranty or Bargain and Sale (Specify Below)
F ☐ Sale of Fractional or Less than Fee Interest (Specify Below)
G ☐ Significant Change in Property Between Taxable Status and Sale Dates
H ☐ Sale of Business is Included in Sale Price
I ☐ Other Unusual Factors Affecting Sale Price (Specify Below)
J ☑ None

ASSESSMENT INFORMATION - Data should reflect the latest Final Assessment Roll and Tax Bill

15. Building Class: Z 9

16. Total Assessed Value (of all parcels in transfer): 8 1 0 0 0

17. Borough, Block and Lot / Roll Identifier(s) (If more than three, attach sheet with additional identifier(s))

BROOKLYN 3978 14

2017062800282201O1

CERTIFICATION

I certify that all of the items of information entered on this form are true and correct (to the best of my knowledge and belief) and understand that the making of any willful false statement of material fact herein will subject me to the provisions of the penal law relative to the making and filing of false instruments.

BUYER

BUYER SIGNATURE | DATE: 5/3/2017

203-211 VAN SICLEN AVENUE

STREET NUMBER | STREET NAME (AFTER SALE)

BROOKLYN | NY | 11207

CITY OR TOWN | STATE | ZIP CODE

BUYER'S ATTORNEY

LAST NAME | FIRST NAME

AREA CODE | TELEPHONE NUMBER

SELLER

SELLER SIGNATURE | DATE: 5/3/2017

2017041900016201

ATTACHMENT E
SECTION VI: CURRENT PROPERTY OWNER / OPERATOR INFORMATION

Site Owner and Operator

The site is owned by Van Siclen Realty LLC, a New York Corporation, and is used for storage of construction equipment.

Previous Site Owners

The most recent deeds for the site, dated May 3, 2017, identify the present owner of the property as Van Siclen Realty LLC. Current and former addresses and telephone numbers of the previous property owners are not available. There is no relationship between the requestor's corporate members and any of the previous owners. The following is a list of available deed information via the New York City Department of Finance Automated City Register Information System (ACRIS) website.

Block 3978, Part of Lot 14				
Date	**Document Type**	**First Party**	**Second Party**	**Relationship to Applicant**
05/03/2017	Deed	Cano, Adolfo	Van Siclen Realty LLC	Applicant
06/16/1997	Deed	Southeast Holding Corp.	Cano, Adolfo	None
06/13/1997	Deed	Greenberger, Tomas/Ref	Southeast Holding Corp.	None
06/25/1985	Deed	NYC Public Dvlpt. Corp.	45th Ave Holding Corp.	None
06/25/1985	Deed	City of New York	NYC Public Deve/Corp.	None
09/16/1976	Deed	Ivan E. Irizarry	City of New York	None
04/04/1976	Deed	Friend Management Co.	Wein Management Co.	None
10/17/1966	Deed	Friendly Management Corp.	Friend Management Co.	None

Block 3978, Part of Lot 15				
Date	**Document Type**	**First Party**	**Second Party**	**Relationship to Applicant**
05/03/2017	Deed	Cano, Adolfo	Van Siclen Realty LLC	Applicant
07/27/2015	Tax Lien Sales Certificate	City of New York	Bank of New York	None

Block 3978, Part of Lot 15				
Date	**Document Type**	**First Party**	**Second Party**	**Relationship to Applicant**
06/16/1997	Deed	Southeast Holding Corp.	Cano, Adolfo	None
06/13/1997	Deed	Greenberger, Tomas/Ref	Southeast Holding Corp.	None
06/25/1985	Deed	NYC Public Dvlpt. Corp.	45th Ave Holding Corp.	None
06/25/1985	Deed	City of New York	NYC Public Deve/Corp.	None
08/02/1979	Deed	Finance Admin	City of New York	None
02/05/1975	Deed	Holliday Painters Inc.	Showsiclen Corp.	None
07/02/1973	Deed	203 Siclen Corp.	Holliday Painters Inc.	None
06/02/1971	Deed	Dime Savs Bank of Williamsburgh	203 Siclen Corp.	None
05/12/1971	Deed	Deutsch Harry Referee	Dime Savs Bank of Williamsburgh	None
03/18/1968	Deed	Walker Bldg Renovators Inc.	Tomnat Corp.	None
11/13/1967	Deed	21st Century Development Corp.	Walker Bldg Renovators Inc.	None
09/08/1967	Deed	Carrol Development Corp.	21st Century Development Corp.	None

Previous Site Operators

Prior to May 2017 the site was used for the storage and maintenance of automobiles and automotive parts. An "illegal chop shop" was noted at the site in 1996 by the New York City Police Department.

Sanborn® Fire Insurance Maps from 1887 to 2007 were reviewed. As early as 1887, the site was divided into four adjoining tax lots and occupied by one 2-story dwelling with a basement. By 1908, the site was vacant and unimproved. From at least 1928 to 1966, the site was occupied by a 4-story residential building with a store. By 1977, Lot 14 was vacated and unimproved; and the entire site was vacated and unimproved by 1981.

Historic phone records indicate that the site was occupied by a variety of private residents from 1934 – 1973. Phone records also noted a grocery store on site from 1940 – 1965 and a marble and tile company in 1940. Current contact information for prior residences is unknown. The most recent commercial owner and occupant, Adolfo Cano, can be reached at 718-235-9647.

ATTACHMENT F
SECTION IX: CONTACT LIST INFORMATION

Item 1 – Chief Executive and Planning Board

Chief Executive Officer
Mayor Bill de Blasio
City Hall
260 Broadway Avenue
New York, NY 10007

New York City Planning Commission
Marisa Lago, Chair
Department of City Planning
120 Broadway, 31st Floor
New York, NY 10271

Borough of Brooklyn, Borough President
Eric L. Adams
Brooklyn Borough Hall
209 Joralemon Street
Brooklyn, NY 11201
(718) 802-3700

Borough of Brooklyn, Department of City Planning
Joseph I. Douek, President
16 Court Street, 7th Floor
Brooklyn, NY 11241
(718) 780-8280

Item 2 – Nearby Residents and Property Owners

The site is used for the storage of construction equipment and owned by Van Siclen Realty LLC.

Van Siclen Realty LLC; Lisa Inzerillo
60 Lyman Place
Staten Island, New York, 10306
(347) 861-7388

Owners and occupants of adjoining properties include:

509 Liberty Avenue
One-story commercial building
Owner: John Nieman (President of operating business below)
Operator: Funeraria Juan-John's Funeral Home

510 Liberty Avenue
Commercial Lot
Owner: 510 Liberty Avenue, LLC
Owner Address:
144-44 157th Street
Jamaica, NY 11434

511 Liberty Avenue
Vacant Lot
Owner and Operator: City of New York

515 Liberty Avenue
Two-story residence
Owner and Operator: Francisco Rosario

517 Liberty Avenue
Two-story residence
Owner and Operator: Carmen Plaza

Liberty Avenue (no address record)
Vacant Lot
Owner and Operator: Carmen Plaza

523 Liberty Avenue
Two-story commercial building
Owner: Carlos Ortiz
Owner Address:
601 Pine Street,
Brooklyn, New York
Operator: Mr. Lucky Event Space

524 Liberty Avenue
Three-story residence
Owner and Occupant: Karran Deonarine

288 Hendrix Street
Two-story residence
Owner: 288 H LLC
Owner Address:
1999 Flatbush Avenue
Brooklyn, NY 11234

211 Van Siclen Avenue
Vacant Lot
Owner and Operator: Van Siclen Realty LLC

212 Van Siclen Avenue
Two-story residence
Owner: Fortune Links Capital LLC
Owner Address:
135-16 Northern Blvd
Flushing, NY 11354

Item 3 – Local News Media

Brooklyn Eagle
16 Court Street, Suite 1208
Brooklyn, NY 11241
(718) 422-7400

Item 4 – Public Water Supply

The responsibility for supplying water in New York City is shared between the NYC Department of Environmental Protection, Bureau of Environmental Planning and Analysis, 59-17 Junction Blvd, 11th Floor, Flushing, NY 11373

NYCDEP
Vincent Sapienza, Acting Commissioner
59-17 Junction Boulevard
Flushing, NY 11373

New York City Municipal Water Finance Authority
255 Greenwich Street, 6th Floor
New York, NY 10007

New York City Water Board
Department of Environmental Protection
59-17 Junction Boulevard, 8th Floor
Flushing, NY 11373

Item 5 – Request for Contact

We are unaware of any requests for inclusion on the contact list

Item 6 – Nearby Schools and Day Care Facilities

There are no schools or day care facilities located on the site. The following are schools or day care facilities located within ½ mile of the site:

Breakthrough Christian Day Care Center (About 600 feet southwest of the site)
Administrator
306 Miller Avenue
Brooklyn, NY 11207
(718) 345-1207 (phone number has been disconnected)

Saint Malachy Child Development Center (About 650 feet north of the site)
Loina Johnson, Head Administrator
220 Hendrix Street
Brooklyn, NY 11207
(718) 647-0966

Innocent Hearts Group Family Daycare (About 680 feet north of the site)
Delia Giscombe, On-Site Provider
140 Van Siclen Avenue
Brooklyn, NY 11207
(609) 512-5491

Baybee Lounge Daycare (About 800 feet northwest of the site)
Janet Mendez, Head Administrator
175 Miller Avenue
Brooklyn, NY 11207
(718) 513-0179

Royal Daycare Center (About 1,000 feet southwest of the site)
Regina Bender, Head Administrator
2188 Pitkin Avenue
Brooklyn, NY 11207
(718) 345-0100 (phone number has been disconnected)

P.S. 290 Juan Morel Campos (About 1,150 feet northeast of the site)
Brigitte Newell, Principal
135 Schenck Avenue
Brooklyn, NY 11207
(718) 647-1113

J.H.S. 292 Margaret S. Douglas (About 1,350 feet southwest of the site)
Ahmed Edwards, Principal
301 Vermont Street
Brooklyn, NY 11207
(718) 498-6562

P.S. 089 Cypress Hills (About 1,430 feet northeast of the site)
Irene Leon, Principal
265 Warwick Street
Brooklyn, NY 11207
(718) 964-1180

W.H. Maxwell Career and Technical Education High School (About 1,500 feet southwest of the site)
Jocelyn Badette, Principal
145 Pennsylvania Avenue
Brooklyn, NY 11207
(718) 345-9100

P.S. 158 Warwick (About 1,750 feet southeast of the site)
Audrey Wilson, Principal
400 Ashford Street
Brooklyn, NY 11207
(718) 277-6116

Achievement First Apollo Elementary School (About 1,980 feet northeast of the site)
Tanya Bryant, Principal
350 Linwood Street
Brooklyn, NY 11208
(347) 471-2620

P.S. 149 Danny Kaye (About 2,000 feet southwest of the site)
Yvette Donald, Principal
700 Sutter Avenue
Brooklyn, NY 11207
(718) 688-7620

Joyful Tots Daycare (About 2,200 feet southwest of the site)
Administrator
403 New Jersey Avenue
Brooklyn, NY 11207
(718) 676-7867 (phone number has been disconnected)

Brooklyn Youth Link, Police Athletic League (about 2,250 feet west of the site)
Michelle Bernard, Senior Youth Link Social Worker
2588 Atlantic Avenue
Brooklyn, NY 11207
(718) 342-3902

Little Birds Day Care Center, LLC (About 2,300 feet southeast of the site)
Administrator
490 Linwood Street
Brooklyn, NY 11208
(718) 781-1073

Item 7 – Document Repository

Brooklyn Public Library – Arlington Library
Sandra Eddie, Managing Librarian
203 Arlington Avenue
Brooklyn, NY 11207
Phone: (718) 277-6105

Brooklyn Community Board 5
Melinda Perkins, District Manager
404 Pine Street, 3rd Floor
Brooklyn, NY 11208
Phone: (929) 221-8261

Letters sent to the repositories acknowledging that both agree to act as a document repository for the project are included in this attachment.

Item 8 – Local Community Board

Brooklyn Community Board 5
Melinda Perkins, District Manager
404 Pine Street, 3rd Floor
Brooklyn, NY 11208
Phone: (929) 221-8261

LANGAN

April 30, 2018

Attn: Sandra Eddie, Managing Librarian
Brooklyn Public Library – Arlington Library
203 Arlington Avenue
Brooklyn, NY 12207

Re: Brownfield Cleanup Program Application
Van Siclen Realty, LLC
Site Name: 203-207 Van Siclen Avenue
Site Address: 203-207 Van Siclen Avenue, Brooklyn, NY 11207

Dear Ms. Eddie:

We represent Van Siclen Realty, LLC in their anticipated New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) application for the above-referenced site at 203-207 Van Siclen Avenue, Brooklyn, New York, 11207. It is a NYSDEC requirement that we supply them a letter certifying that the local library is willing and able to serve as a public repository for all documents pertaining to the cleanup of this property. Please sign below and return if you are able to certify that your library would be willing and able to act as the temporary public repository for this BCP project.

Sincerely,
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.

Michael D. Burke

Michael D. Burke, CHMM
Principal/ Vice President

Yes, the Brooklyn Public Library – Arlington Library is willing and able to act as a public repository on behalf of Van Siclen Realty, LLC in their cleanup of 203-207 Van Siclen Avenue under the NYSDEC BCP.

Sandra Eddie
(Name)

5/18/2018
(Date)

SL/S
(Title)

LANGAN

Technical Excellence
Practical Experience
Client Responsiveness

April 17, 2018

Brooklyn Community Board 5
404 Pine Street, 3rd Floor
Brooklyn, NY 11208

Re: Brownfield Cleanup Program Application
Van Siclen Realty, LLC
Site Name: 203-207 Van Siclen Avenue
Site Address: 203-207 Van Siclen Avenue, Brooklyn, NY 11207

To Whom it May Concern:

We represent Van Siclen Realty, LLC in their anticipated New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) application for the above-referenced site at 203-207 Van Siclen Avenue, Brooklyn, New York, 11207. It is a NYSDEC requirement that we supply them a letter certifying that the community board is willing and able to serve as a public repository for all documents pertaining to the cleanup of this property. Please sign below and return if you are able to certify that your facility would be willing and able to act as the temporary public repository for this BCP project.

Sincerely,
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.

Michael D. Burke

Michael D. Burke, CHMM
Principal/ Vice President

Yes, the Brooklyn Community Board 5 is willing and able to act as a public repository on behalf of Van Siclen Realty, LLC in their cleanup of 203-207 Van Siclen Avenue under the NYSDEC BCP.

MELINDA PERKINS.
(Name)

4/17/2018.
(Date)

DISTRICT MANAGER
(Title)

ATTACHMENT G
SECTION X: LAND USE FACTORS

Item 1 - Current Zoning

According to the on-line New York City's Zoning and Land Use Map, the site is located within a Special Mixed Use Paired Manufacturing and Residential District (M1-4/R6A). This paired district promotes development and expansion of the longstanding mix of residential, commercial, industrial, and cultural use throughout the area. M1 districts typically include retail and light industrial uses such as woodworking shops, repair shops, and wholesale service and storage facilities, and R6A districts promote residential development. Zoning is consistent with the proposed residential development. The surrounding area is primarily residential and industrial, but also includes commercial buildings, public facilities, day care centers, and schools.

As a result of the CEQR process, Block 3978 Lots 14 and 15 were assigned an E-Designation (E-366) on April 20, 2016 by the New York City Department of City Planning (NYCDCP) as part of the East New York rezoning (CEQR No. 15DCP102K). The E-Designation requires coordination with the New York City Office of Environmental Remediation (NYC OER) to obtain a Notice to Proceed (NTP) or a Notice of No Objection (NNO) prior to obtaining building permits. The E-Designation addresses environmental requirements for Hazmat and noise (window wall attenuation and alternative means of ventilation) during development.

Item 2 - Current Site Use

The about 10,000-square-foot (0.23 acre) site is currently used for storage of construction equipment. Most recently (prior to the May 3, 2017 sale) the site was owned by Adolfo Cano, and used to store and maintain automobiles and automotive parts.

Item 3 - Intended Use Post-Remediation

Redevelopment plans for the site are still in the early planning stages, but conceptual designs include a residential building with a portion dedicated to low-income affordable units.

Item 5 - Consistency with Applicable Zoning Laws/Maps

This project is consistent with the goals of the City Council as embodied in the NYC Zoning Districts. The site is located within the Brooklyn Special Mixed Use Paired Manufacturing and Residential District (M1-4/R6A). Multiple-story, mixed-use commercial and residential buildings are permitted in this M1-4/R6A district. The project will also include an affordable housing component. The applicable zoning map is included in Attachment B.

Item 6 - Comprehensive Plans

The proposed use is consistent with the East New York Neighborhood Plan published by the NYC Department of City Planning. The Neighborhood Plan promotes moderate density industrial, commercial, and residential development for the site lots and immediately surrounding areas to the east and west.

APPENDIX B

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

For

203-211 VAN SICLEN AVENUE
BROOLYN, NEW YORK
Brooklyn Tax Map Block 3978, Lots 14 and 15

Prepared For

Van Siclen Realty
60 Lyman Place
New York, NY 10304

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

April 2019
Langan Project No. 170513001

TABLE OF CONTENTS

Page No.

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

***** 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 anticipated site work at 203-211 Van Siclen Avenue, in the borough of Brooklyn, New York (Tax Map Block 3978, Lots 14 and 15) ("the site"). This HASP provides the minimum requirements for implementing site operations during environmental investigation activities. All contractors performing work on this site shall implement their own Health and Safety Plans that, at a minimum, adhere to this HASP. The contractor is solely responsible for their own health and safety and that of their subcontractors. Langan personnel will implement this HASP while on-site.

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 site 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 site is located at 203-207 Van Siclen Avenue and comprises Block 3978, Lots 14 and 15, in the East New York neighborhood of Brooklyn New York. The approximately 10,000-square-foot site is bound to the north by Liberty Avenue followed by residences; to the east by residences and an auto body shop followed by Hendrix Avenue; to the south by a vacant lot and residences followed by Glenmore Avenue; and to the west by Van Siclen Avenue followed by mixed-use commercial/residential buildings. Long Island Rail Road (LIRR) tracks run east-west below Atlantic Avenue, about 425 feet north of the site. The site is currently used for storage of construction equipment. Soil/historic fill material covers most of the site with isolated patches of low vegetation and gravel. A site location map is provided as Figure 1, and a site plan is provided as Figure 1.

Based on information from the current owner, the site was used for storage and maintenance of automobiles prior to May 2018, when the current owner purchased the site. As early as 1887, the site was divided into four adjoining tax lots and occupied by one 2-story dwelling with a basement. By 1908, the site was vacant and unimproved. From at least 1928 to 1966, the site

was occupied by a 4-story residential building with a store. By 1977, Lot 14 was vacant and unimproved, and the entire site was vacant and unimproved by 1981.

NYSDEC Spill No. 9601652 was reported at 522 Liberty Avenue (an alternate address for 203-207 Van Siclen Avenue) on May 1, 1996 when the New York Police Department (NYPD) executed a search warrant for an illegal chop shop and discovered the site contaminated with various chemicals, oils, and other unknown materials. Spill case notes indicated that unknown amounts of unknown material, unknown hazardous material, and unknown petroleum were spilled across the surface of the site. The spill was closed on May 2, 1996; but no available information pertinent to the remediation is available.

1.3 Summary of Work Tasks

The general categories of work tasks being performed during implementation of the work plan include:

1.3.1 Geophysical Investigation

Prior to the commencement of intrusive field activities (i.e., soil borings); a geophysical consultant may conduct a geophysical survey using ground penetrating radar (GPR) and electromagnetic detection equipment. Langan personnel will coordinate the geophysical survey. The objective of the survey will be to identify any underground storage tank (UST) structures, drains, underground utilities, and other subsurface anomalies that may be encountered during the investigation. During this time Langan personnel will inspect the site and confirm sample locations.

1.3.2 Soil Investigation and Sampling

Langan will retain a drilling contractor to advance soil borings to a depth below grade surface (bgs) specified in the work plan. Borings will be installed at the approximate locations indicated in Langan's work plan, and may be moved in the field based on utility clearance and accessibility. The drilling contractor will contact the appropriate utility mark-out authority and make available to their drilling staff the verification number and effective dates.

Langan personnel will screen soil for visual, olfactory, and instrumental indicators suggestive of a potential petroleum release. Instrument screening for the presence of VOCs may be performed with a calibrated photoionization detector (PID) equipped with a 10.6 electron volt (eV) bulb (or equivalent). Langan personnel will collect soil samples from the proposed soil boring locations following the sampling plan outlined in the work plan. The borings will be filled with clean soil cuttings or bentonite grout after samples are collected.

Soil 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.

1.3.3 Groundwater Investigation and Sampling

Selected soil borings will be converted into groundwater monitoring wells and sampled to evaluate groundwater quality. Groundwater samples will be collected from one or more of the new and pre-existing monitoring wells in accordance with the Langan Low Flow Groundwater Sampling SOP (SOP #12). Groundwater samples will be submitted to an NYSDOH ELAP-certified laboratory and analyzed for constituents as specified in the work plan. The monitoring wells will be backfilled and abandoned in accordance with State and Local regulations at a later undetermined date.

1.3.4 Soil Vapor Point Installation and Sampling

The drilling contractor will install soil vapor points to a depth defined in the work plan. Vapor samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (New York State Department of Health [NYSDOH] October 2006) and Langan's Soil Vapor Sampling SOP (SOP #13). Conditions in the field may require adjustment of sampling locations.

One ambient air sample will be collected for use as a comparison sample. The subsurface soil vapor samples will be collected using a stainless steel soil vapor implant and tubing or similar method. The annulus around the probe and tubing will be filled with sand to two inches above the probe. Bentonite slurry will be applied to the top of the sand up to seal the sampling points.

1.3.5 Drum Sampling

Excess or impacted soil and water will be drummed in DOT approved 55-gallon drums during the remedial action activities and must be labeled in accordance with the Langan Drum Labeling Standard Operating Procedure (SOP-#9). Langan personnel will 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 a NYSDOH ELAP-certified laboratory.

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 Jennifer Armstrong. Her responsibilities include:

- Ensuring that this HASP is developed 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 *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 site 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 to be determined prior to the start of site activities. 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 solely 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;
- 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 adherer 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. Known and suspected chemical contaminant hazards that could be encountered during site operations are included in Table 2. A 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 Geophysical Survey

Langan personnel are not permitted to operate or otherwise handle the geophysical equipment including any downhole geophysical equipment subsequently used to survey boreholes. When soil, groundwater or soil vapor point locations are surveyed with surface geophysical equipment, the locations of the point as well as possible utilities and other artifacts that may interfere with the subsurface investigation are to be marked with indelible paint, flags, or color tape (when marking indoor locations that the client has specifically requested not be marked with indelible paint). When applying paint, proper PPE including at a minimum hand protections should be used.

3.1.2 Soil Investigation and Sampling

Sampling the soil requires the donning of chemical resistant gloves in addition to the standard PPE. Langan personnel are not to operate drilling or excavation equipment nor open sampling devices (acetate liners, sonic sample bags, etc.). These tasks are to be completed by the driller or excavation contractor.

3.1.3 Indoor Drilling and Excavation

The work scope may require indoor drilling or drilling in locations where there may not be adequate ventilation sufficient to safely operate any rig or excavation equipment powered by an

internal combustion engine. Where possible, all such work should be done by equipment powered by electricity. If such equipment is used and must be directly wired to the buildings electrical system or to an independent system, this work must be completed by a licensed electrician in accordance with all electrical codes applicable to the work.

Indoor work which is to be completed with equipment powered by an internal combustion engine must incorporate air monitoring of carbon monoxide (CO) using calibrated air monitoring equipment (MultiRAE or equivalent). In addition, the work plan should incorporate mitigation for venting engine exhaust fumes directly to the outdoors and for circulating fresh air into the work area.

The OSHA Time Weighted Average (TWA) Permissible Exposure Limit (PEL) for CO from 50 to 35 parts per million (ppm). Langan will monitor CO with a suitable monitoring device. If CO levels exceed 5 ppm, Langan will instruct contractors to begin mitigation measures. These measures are at a minimum:

- Increase air circulation using industrial size fans to bring additional fresh air into the building or vent exhaust to the outside;
- Modify the passive exhaust method being used to increase venting circulation by using wider diameter tubing or sealing tubing connections; or
- Modify the work schedule where the rig is turned off to allow time for CO levels to fall back to background

All work must cease if CO levels reach 35 ppm. The Langan engineer is to report to the PM and H&S officer when an action level is reached.

3.1.4 Groundwater Investigation and 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. Langan personnel are not to operate drilling equipment nor assemble or install monitoring well equipment. These tasks are to be completed by the driller contractor.

3.1.5 Vapor Investigation and Sampling

Sampling vapor requires the donning of work gloves in addition to the standard PPE when assembling the Summa™ canister with the regulator and cut resistant gloves when cutting sampling- or silicone-tubing to length. Langan personnel are not to operate drilling equipment nor assemble or install soil vapor point equipment. These tasks are to be completed by the drilling contractor.

3.1.6 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^{O}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^{o}F (37.6^{o}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^{o}F. If oral temperature still exceeds 99.6^{o}F (37.6^{o}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^{o}F (38.1^{o}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, id., 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^{o} to 60^{o}F (10^{o} to 16.6^{o}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^{O}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^{O}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^{O}F, or wind-chill less than 30^{O}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^{O}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 (GFCIs) 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)

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. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

3.4 Biological Hazards

3.4.1 Animals

No animals are expected to be encountered during site operations.

3.4.2 Insects

Insects are not expected to be encountered during site operations.

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 groundwater 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 ft 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-piece, 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 ACTIONS LEVELS

7.1 Monitoring During Site Operations

Atmospheric air monitoring results are 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 will 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 will 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 will occur during intrusive work in the AOCs. Colormetric 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 should 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^3 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 the NYSDOH 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 performance standards from DER-10 Appendix 1B.
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 (µg/m³) 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 µg/m³ 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 µg/m³ 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 µg/m³ of the upwind level and in preventing visible dust migration.

8.1 Vapor Emission Response Plan

This section applies if VOC monitoring is required. If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the hot zone, boring and well installation, and excavation activities will be halted or odor controls will be employed, and monitoring continued. When work shut-down occurs, downwind air monitoring as directed by the HSO or FTL will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

If the organic vapor level decreases below 5 ppm above background, sampling and boring and well installation can resume, provided:

- The organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 1 ppm over background, and
- More frequent intervals of monitoring, as directed by the HSO or FTL, are conducted.

8.2 Major Vapor Emission

This section applies if VOC monitoring is required. If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted or odor controls must be implemented.
If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the hot zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone). If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

- Sustained organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes, or
- Organic vapor levels greater than 5 ppm above background for any time period.

8.3 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

- The local police authorities will immediately be contacted by the HSO or FTL and advised of the situation;
- Frequent air monitoring will be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO or FTL; and
- All Emergency contacts will go into effect as appropriate.

8.4 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 will be performed by removing all PPE used in EZ and placing it in drums/trash cans at the CRZ. Baby wipes shall 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

Hand Signal	Meaning
Thumbs up	OK; I'm alright; I understand
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:

Brookdale Hospital Medical Center
Linden Avenue at Brookdale Plaza
Brooklyn, New York
718-240-5000

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, 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 the Langan Incident/Injury Hotline ***(800) 9-LANGAN*** (800-952-6426) extension 4699 should be called as soon as possible.

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 possible, the HSO will contact the Langan Incident/Injury Hotline (1-800-952-6426) or (973-560-4699) and Project Manager of identify any emergency situation.

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. However, 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 Mobile Office and Vehicles
- Emergency Eye Wash: Contractor Mobile office and 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.

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 RECORDKEEPING

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

17.1 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.

17.2 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.

17.3 Onsite Log

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

17.4 Daily Safety Meetings ("Tailgate Talks")

Completed safety briefing forms will be maintained by the HSO.

17.5 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.

17.6 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 E). Langan's written hazard communication program, in compliance with 29 CFR 1910.1200, is maintained by the HSM.

17.7 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.

18.0 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.

19.0 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.

Printed Name	Signature	Company	Date

TABLES

TABLE 1
TASK HAZARD ANALYSES

Task	Hazard	Description	Control Measures	First Aid
1.3.1 – 1.3.5	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 – 1.3.5	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 – 1.3.5	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 – 1.3.5	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 – 1.3.5	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 – 1.3.5	Noise	Excavation equipment, hand tools, drilling equipment.	Wear hearing protection; maintain safe distance from construction activities	Seek medical attention as required
1.3.1 – 1.3.5	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 – 1.3.5	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 – 1.3.5	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 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	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 – 1.3.5	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 – 1.3.5	1,3-Dichlorobenzene m-Dichlorobenzol; m-Phenylene dichloride m-dichlorobenzene	541-73-1	PID	None None	Groundwater Soil Vapor	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash 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 – 1.3.5	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 – 1.3.5	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 – 1.3.5	4,4'-DDD Dichlorodiphenyldichloroethane 1,1'-(2,2-Dichloroethylidene)bis (4-chlorobenzene)	72-54-8	None	NA NA	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [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 – 1.3.5	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
1.3.1 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	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
1.3.1 – 1.3.5	Anthracene	120-12-7	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Aroclor 1248	12672-26-6	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	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 – 1.3.5	Aroclor 1260	11096-82-5	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Arsenic	NA	None	0.5 mg/m^3 NA	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation skin, possible dermatitis; resp distress; diarrhea; muscle tremor, convulsions; possible gastrointestinal tract	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Barium	10022-31-8	None	0.5 mg/m^3 50 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Benzene Benzol Phenyl hydride	71-43-2	PID	3.19 mg/m^3 1,595 mg/mg^3	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 – 1.3.5	Benzo(a)anthracene Benzanthracene Benzanthrene 1,2-Benzanthracene Benzo[b]phenanthrene Tetraphene	56-55-3	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Benzo(a)pyrene	50-32-8	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Benzo(b)fluoranthene	205-99-2	PID	0.2 mg/m^3 80 mg/m^3 (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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	Benzo(g,h,i)perylene Benzo(ghi)perylene	191-24-2	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Benzo(k)fluoranthene	207-08-9	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Cadmium	7440-43-9	None	0.005 mg/m^3 9 mg/m^3	Soil	inhalation, ingestion	pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash 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 – 1.3.5	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 – 1.3.5	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
1.3.1 – 1.3.5	Chloroform Methane trichloride Trichloromethane	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 – 1.3.5	Chromium Total Chromium	7440-47-3	None	1.0 mg/m^3 250 mg/m^3	Groundwater Soil	inhalation absorption ingestion	irritation to eye, skin, and respiratory	Eye: Irrigate immediately Skin: Soap wash 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 – 1.3.5	Chrysene Benzo[a]phenanthrene 1,2-Benzphenanthrene	218-01-9	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Cis-Chlordane Cic-Chlordane a-Chlordane alpha Chlordane alpha-chlordane cis-Chlordan CIS-CHLORDANE Chlordane cis-;Chlordane cis;ALPHA-CHLORDAN Chlordan, cis-ALPHA-CHLORDANE alpha(cis)-chlordane α-chlordane solution	5102-71-9	None	0.5 mg/m^3 100 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	Blurred vision; confusion; ataxia, delirium; cough; abdominal pain, nausea, vomiting, diarrhea; irritability, tremor, convulsions; anuria	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Copper	7440-50-8	None	1.0 mg/m^3 100 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, nose, metallic taste; dermatitis; anemia	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 – 1.3.5	Cyanide	57-12-5	None	5 mg/m^3 25 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	Exposure to cyanide can cause weakness, headaches, confusion, dizziness, fatigue, anxiety, sleepiness, nausea and vomiting. Breathing can speed up then become slow and gasping. Coma and convulsions also occur. If large amounts of cyanide have been absorbed by the body, the person usually collapses and death can occur very quickly. Long-term exposure to lower levels of cyanide can cause skin and nose irritation, itching, rashes and thyroid changes.	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	DDE 4,4-DDE 1,1-bis-(4-chlorophenyl)-2,2-dichloroethene Dichlorodiphenyldichloroethylene	72-55-9	None	NA NA	Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	Oral ingestion of food is the primary source of exposure for the general population. Acute and chronic ingestion may cause nausea, vomiting, diarrhea, stomach pain, headache, dizziness, disorientation, tingling sensation, kidney damage, liver damage, convulsions, coma, and death. 4,4' DDE may cross the placenta and can be excreted in breast milk	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	DDT 4,4-DDT 4,4'-DDT p,p'-DDT Dichlorodiphenyltrichloroethane 1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane	50-29-3	None	1 mg/m^3 500 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [potential occupational carcinogen]	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Dibenz(a,h)anthracene Dibenzo(a,h)anthracene	53-70-3	PID	0.2 mg/m^3 80 mg/m^3 (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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	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 – 1.3.5	Dichlorodifluoromethane Difluorodichloromethane, Fluorocarbon 12 Freon 12 Freon® 12 Genetron® 12 Halon® 122 Propellant 12 Refrigerant 12 Dichlorodifluromethane	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 – 1.3.5	Dieldrin HEOD 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo exo-5,8-dimethanonaphthalene	60-57-1	PID	0.25 mg/m^3 50 mg/m^3	Groundwater Soil Water	inhalation, skin absorption, ingestion, skin and/or eye contact	headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort), sweating; myoclonic limb jerks; clonic, tonic convulsions; coma; [potential occupational carcinogen]; in animals: liver, kidney damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	Ethyl benzene Ethylbenzene Ethylbenzol Phenylethane	100-40-4	PID	435 mg/m^3 3,472 mg/m^3	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 – 1.3.5	Fluoranthene Benzo(j, k)fluorene	206-44-0	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Fluorene	86-73-7	PID	0.2 mg/m^3 80 mg/m^3 (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 attenti

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	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 – 1.3.5	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 – 1.3.5	Helium	7440-59-7	Helium Detector	NA NA	NA	inhalation	dizziness, headache, and nausea	Breathing: Respiratory support
1.3.1 – 1.3.5	Heptane n-Heptane	142-82-5	PID	500 ppm 750 ppm	Goundwater 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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	Hexavalent Chromium Chromium VI	18540-29-9	None	1.0 mg/m^3 250 mg/m^3	Groundwater Soil	inhalation absorption ingestion	irritation to eye, skin, and respiratory	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Indeno(1,2,3-cd)pyrene	193-39-5	None	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	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 – 1.3.5	Lead	7439-92-1	None	0.050 mg/m^3 100 mg/m^3	Groundwater Soil	inhalation, ingestion, skin and/or eye contact	lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation to the eyes; hypertension	Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Magnesium	7439-95-4	None	15 mg/m^3 NA	Soil	inhalation, skin and/or eye contact	irritation to the eyes, skin, respiratory system; cough	Eye: Irrigate immediately Breathing: Fresh air
1.3.1 – 1.3.5	Manganese	7439-96-5	None	5 mg/m^3 500 mg/m^3	Groundwater Soil	inhalation, ingestion	aerosol is irritating to the respiratory tract	Eye: Irrigate immediately Skin: Soap flush promptly Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Mercury	7439-97-6	None	0.1 mg/m^3 10 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	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 – 1.3.5	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 – 1.3.5	m-Xylenes 1,3-Dimethylbenzene m-Xylol Metaxylene	108-38-3	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
1.3.1 – 1.3.5	Naphthalene Naphthalin Tar camphor White tar	91-20-3	PID	50 mg/m^3 250 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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	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
1.3.1 – 1.3.5	Nickel	7440-02-0	None	NA 10 mg/m^3	Groundwater Soil	ion, ingestion, skin and/or eye contact	sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	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 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	n-Propylbenzene Isocumene Propylbenzene 1-Phenylpropane 1-Propylbenzene Phenylpropane	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
1.3.1 – 1.3.5	o-Xylenes 1,2-Dimethylbenzene ortho-Xylene o-Xylol	95-47-6	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 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	Phenanthrene	85-01-8	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	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 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	Pyrene benzo[def]phenanthrene	129-00-0	PID	0.2 mg/m^3 80 mg/m^3 (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 – 1.3.5	Selenium	7782-49-2	None	1 mg/m^3 0.2 mg/m^3	Soil	inhalation, ingestion, skin and/or eye contact	irritation to the eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage	Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	Tetrachloroethylene Perchlorethylene Perchloroethylene PCE Perk Tetrachlorethylene 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 – 1.3.5	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 – 1.3.5	Total PCBs Chlorodiphenyl (42% chlorine) Aroclor® 1242 PCB Polychlorinated biphenyl	53469-21-9	None	0.5 mg/m^3 5 mg/m^3	Groundwater Soil	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation to the eyes, chloracne	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 – 1.3.5	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 – 1.3.5	Trichloroethylene 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
1.3.1 – 1.3.5	Trichlorofluoromethane Fluorotrichloromethane Freon® 11 Monofluorotrichloromethane Refrigerant 11 Trichloromonofluoromethane	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

Task	Contaminant	CAS Number	Monitoring Device	PEL/ IDLH	Source of Concentration on Site	Route of Exposure	Symptoms	First Aid
1.3.1 – 1.3.5	Trivalent Chromium Chromium III	NA	None	1.0 mg/m^3 250 mg/m^3	Groundwater Soil	inhalation absorption ingestion	irritation to eye, skin, and respiratory	Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
1.3.1 – 1.3.5	Zinc	7440-62-2	None	15 mg/m^3 500 mg/m^3	Groundwater Soil	inhalation	chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function	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^3 = milligrams per cubic meter
500 mg/m3

TABLE 3
Summary of Monitoring Equipment

Instrument	Operation Parameters
Photoionization Detector (PID) MultiRAE	**Hazard Monitored:** Many organic and some inorganic gases and vapors. **Application:** 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. **Detection Method:** Ionizes molecules using UV radiation; produces a current that is proportional to the number of ions. **General Care/Maintenance:** Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories. **Typical Operating Time:** 10 hours. 5 hours with strip chart recorder.
Oxygen Meter MultiRAE	**Hazard Monitored:** Oxygen (O_2). **Application:** Measures the percentage of O_2 in the air. **Detection Method:** Uses an electrochemical sensor to measure the partial pressure of O_2 in the air, and converts the reading to O_2 concentration. **General Care/Maintenance:** Replace detector cell according to manufacturer's recommendations. Recharge or replace batteries prior to explanation of the specified interval. If the ambient air is less than 0.5% C O_2, replace the detector cell frequently. **Typical Operating Time:** 8 – 12 hours.
Additional equipment (if needed, based on site conditions)	
Combustible Gas Indicator (CGI) MultiRAE	**Hazard Monitored:** Combustible gases and vapors. **Application:** Measures the concentration of combustible gas or vapor. **Detection Method:** 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. **General Care/Maintenance:** Recharge or replace battery. Calibrate immediately before use. **Typical Operating Time:** Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.
Flame Ionization Detector (FID) with Gas Chromatography Option *(i.e., Foxboro Organic Vapor Analyzer (OVA))*	**Hazard Monitored:** Many organic gases and vapors (approved areas only). **Application:** 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. **General Care/Maintenance:** Recharge or replace battery. Monitor fuel and/or combustion air supply gauges. Perform routine maintenance as described in the manual. Check for leaks. **Typical Operating Time:** 8 hours; 3 hours with strip chart recorder.
Potable Infrared (IR) Spectrophotometer	**Hazard Monitored:** Many gases and vapors. **Application:** Measures concentration of many gases and vapors in air. Designed to quantify one or two component mixtures. **Detection Method:** Passes different frequencies of IR through the sample. The frequencies absorbed are specific for each compound. **General Care/Maintenance:** As specified by the manufacturer.

Instrument	Operation Parameters
Direct Reading Colorimetric Indicator Tube	**Hazard Monitored:** Specific gas and vapors. **Application:** Measures concentration of specific gases and vapors. **Detection Method:** 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. **General Care/Maintenance:** 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.
Aerosol Monitor	**Hazard Monitored:** Airborne particulate (dust, mist, fume) concentrations **Application:** Measures total concentration of semi-volatile organic compounds, PCBs, and metals. **Detection Method:** 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. **General Care/Maintenance:** 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.
Monitox	**Hazard Monitored:** Gases and vapors. **Application:** Measures specific gases and vapors. **Detection Method:** Electrochemical sensor relatively specific for the chemical species in question. **General Care/Maintenance:** Moisten sponge before use; check the function switch; change the battery when needed.
Gamma Radiation Survey Instrument	**Hazard Monitored:** Gamma Radiation. **Application:** Environmental radiation monitor. **Detection Method:** Scintillation detector. **General Care/Maintenance:** Must be calibrated annually at a specialized facility. **Typical Operating Time:** Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.

TABLE 4
INSTRUMENTATION ACTION LEVELS

Photoionization Detector Action Levels	**Action Required**
Background to 5 ppm	No respirator; no further action required
> 1 ppm but < 5 ppm for > 5 minutes	1. Temporarily discontinue all activities and evaluate potential causes of the excessive readings. If these levels persist and cannot be mitigated (i.e., by slowing drilling or excavation activities), contact HSO to review conditions and determine source and appropriate response action. 2. If PID readings remain above 1 ppm, temporarily discontinue work and upgrade to Level C protection. 3. If sustained PID readings fall below 1 ppm, downgrading to Level D protection may be permitted.
> 5 ppm but < 150 ppm for > 5 minutes	1. Discontinue all work; all workers shall move to an area upwind of the jobsite. 2. Evaluate potential causes of the excessive readings and allow work area to vent until VOC concentrations fall below 5 ppm. 3. Level C protection will continue to be used until PID readings fall below 1 ppm.
> 150 ppm	Evacuate the work area

Notes:
1. 1 ppm level based on OSHA Permissible Exposure Limit (PEL) for benzene.
2. 5 ppm level based on OSHA Short Term Exposure Limit (STEL) maximum exposure for benzene for any 15 minute period.
3. 150 ppm level based on NIOSH Immediately Dangerous to Life and Health (IDLH) for tetrachloroethylene.

TABLE 5
EMERGENCY NOTIFICATION LIST

ORGANIZATION	CONTACT	TELEPHONE
Local Police Department	NYPD	911
Local Fire Department	NYFD	911
Ambulance/Rescue Squad	NYFD	911
Hospital	Brookdale Hospital Medical Center	911 or 718-240-5000
Langan Incident / Injury Hotline		917-613-7234
Langan Environmental Project Manager	Jennifer Armstrong	917-613-7234 (cell)
Langan Health and Safety Manager (HSM)	Tony Moffa	215-756-2523 (cell)
Langan Health & Safety Officer (HSO)	William Bohrer	410-984-3068 (cell)
Langan Field Team Leader (FTL)	To Be Determined	
Client's Representative	Lisa Inzerillo	917-292-3369 (cell)
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 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).

TABLE 6
SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATED WORKERS[A]

Adjusted Temperature[b]	Normal Work Ensemble[c]	Impermeable Ensemble
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 ^{o}F = ta ^{o}F + (13 x % 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

	ENVIRONMENTAL TEMPERATURE (Fahrenheit)										
	70	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**
RELATIVE HUMIDITY	**APPARENT TEMPERATURE***										
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	116
20%	66	72	77	82	87	93	99	105	112	120	**130**
30%	67	73	78	84	90	96	104	113	123	**135**	**148**
40%	68	74	79	86	93	101	110	123	**137**	**151**	
50%	69	75	81	88	96	107	120	**135**	**150**		
60%	70	76	82	90	100	114	**132**	**149**			
70%	70	77	85	93	106	124	**144**				
80%	71	78	86	97	113	**136**					
90%	71	79	88	102	122						
100%	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

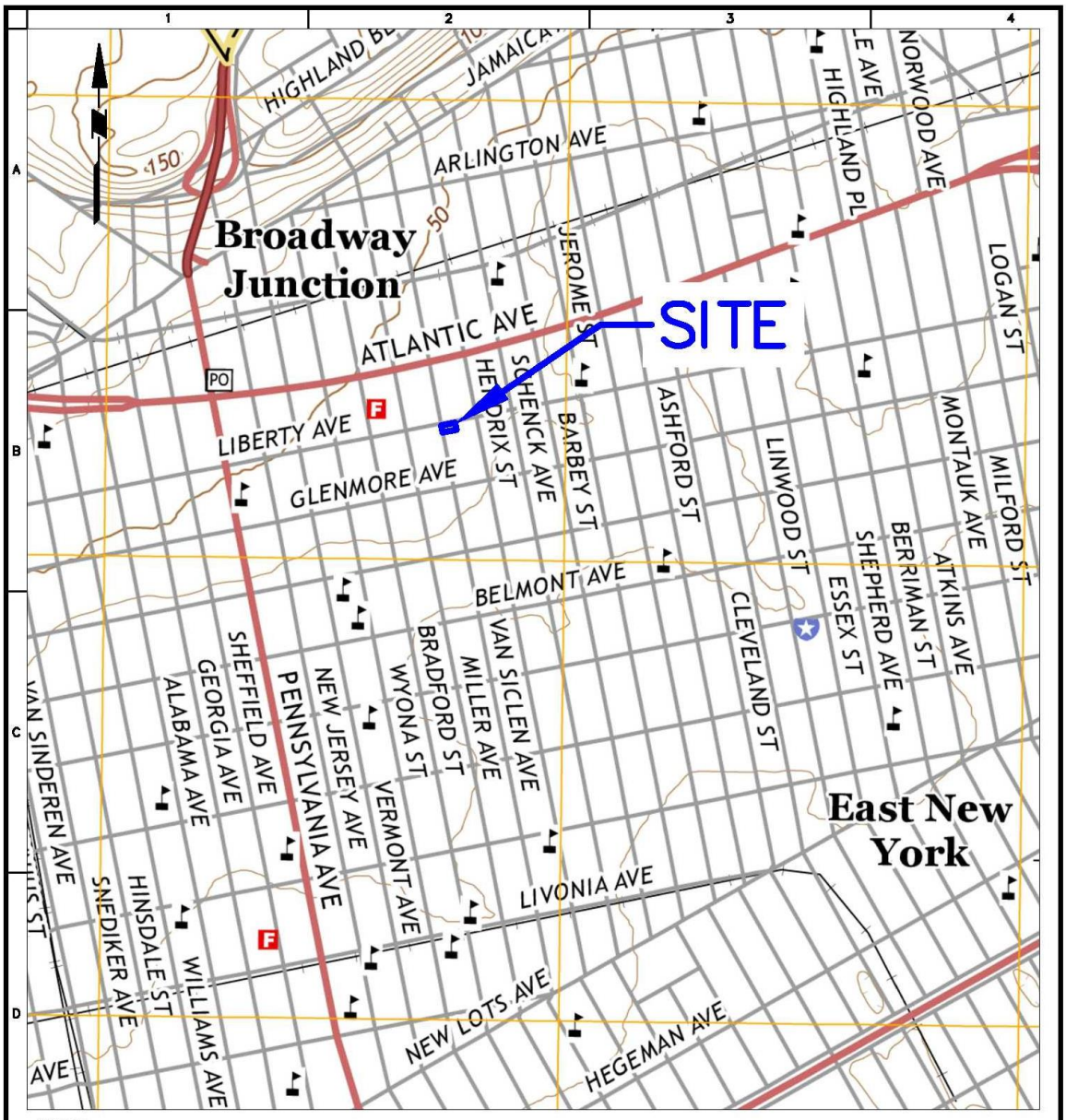
Note: Exposure to full sunshine can increase Heat Index values by up to 15 degrees F.

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



NOTES:

1. BASE MAPS ADAPTED FROM UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5-MINUTE WEEHAWKEN (NEW JERSEY), CENTRAL PARK (NEW YORK), JERSEY CITY (NEW JERSEY), AND BROOKLYN (NEW YORK) TOPOGRAPHIC QUADRANGLES, DATED 2016.

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. S.A.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project	Drawing Title	Project No.	Drawing No.
203-211 VAN SICLEN AVENUE BLOCK No. 3978, LOT No. 15 MANHATTAN NEW YORK	SITE LOCATION MAP	170513001 Date 12/15/2017 Scale 1"=1000' Drawn By ERA / Checked By PM Submission Date	1 Sheet 1 of 1

FIGURE 2

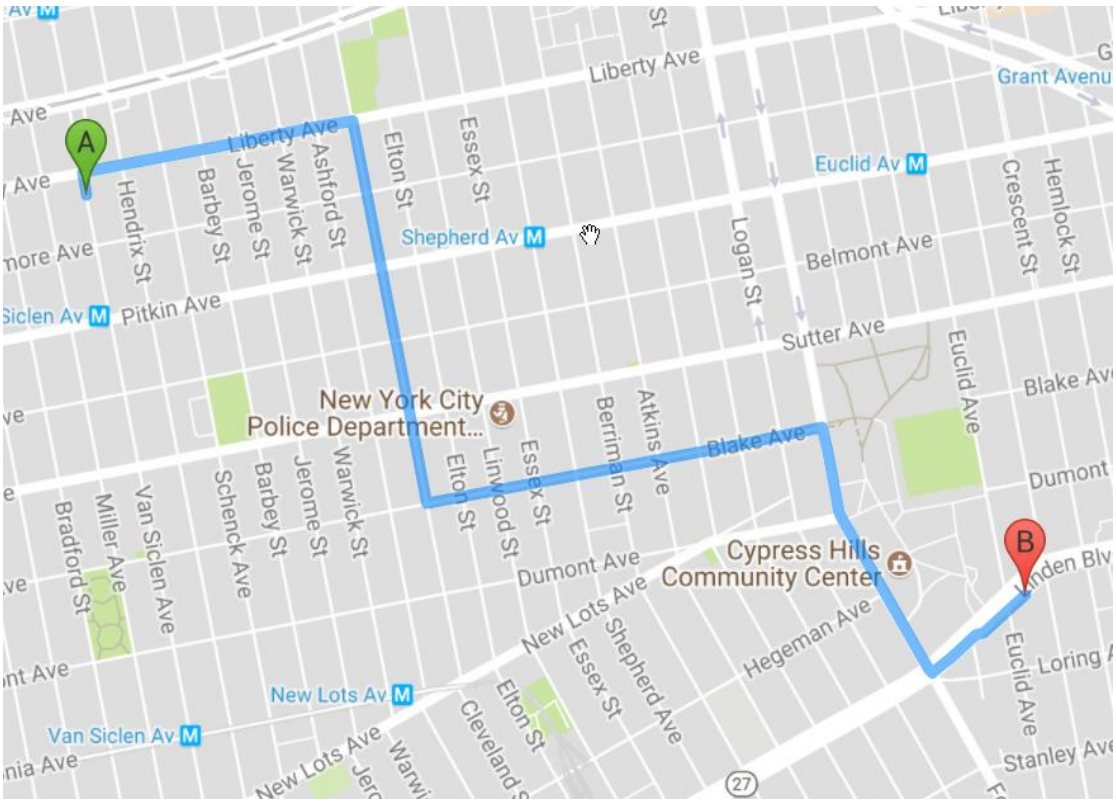
HOSPITAL ROUTE PLAN

Hospital Location: **Brookdale Hospital Medical Center**
Linden Avenue at Brookdale Plaza
Brooklyn, New York
718-240-5000

START: 203-211 Van Siclen Avenue, Brooklyn, NY

1. Head north on Van Siclen Avenue toward Liberty Avenue
2. Turn right at the 1st cross street onto Liberty Avenue
3. Turn right onto Cleveland Street
4. Turn left onto Blake Avenue
5. Turn right onto Fountain Avenue/Marjorie Richardson Street
6. Turn left onto Linden Boulevard
7. Keep right to stay on Linden Avenue, destination will be on the right.

END: Brookdale Hospital Medical Center, Linden Avenue at Brookdale Plaza, Brooklyn, 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 personal protective equipment (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

LEVEL C DECONTAMINATION

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.

LEVEL D DECONTAMINATION

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: _____

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:

Possible causes of the incident (equipment, unsafe work practices, lack of PPE, etc.):

Weather conditions during incident:

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:

HEALTH & SAFETY INFORMATION

Was the operation being conducted under an established site specific CONSTRUCTION HEALTH AND SAFETY PLAN?
Yes ☐ No ☐ Not Applicable: ☐

Describe protective equipment and clothing used by the employee:

Did any limitations in safety equipment or protective clothing contribute to or affect exposure / injury? If so, explain:

Employee Signature Date

Langan Representative Date

ATTACHMENT D

CALIBRATION LOG

DATE:________________ PROJECT:____________________

CALIBRATION LOG

Date & Time	Inst Type	Inst #	Media	Initial Reading	Span #	Calibrat. Reading	Performed By:

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 powerlines?				
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: **JSA NUMBER:**	**DATE CREATED:** **CREATED BY**: **REVISION DATE:** **REVISED BY:**

Langan employees must review and revise the Job Safety Analysis (JSA) as needed to address the any site specific hazards not identified. Employees must provide their signatures on the last page of the JSA indicating they have review the JSA and are aware the potential hazards associated with this work and will follow the provided preventive or corrective measures.

PERSONAL PROTECTIVE EQUIPMENT REQUIRED: (PPE): ■ Required ☒ As Needed		
☐ Steel-toed boots	☐ Nitrile gloves	☐ Dermal Protection (Specify)
☐ Long-sleeved shirt	☐ Leather/ Cut-resistant gloves	☐ High visibility vest/clothing
☐ Safety glasses	☐Face Shield	☐ Hard hat
ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT NEEDED (Provide specific type(s) or descriptions)		
☐ Air Monitoring:	☐ Respirators:	☐ Other:

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE OR CORRECTIVE ACTION
1.	1. 2.	1a. 1b. 2a. 2b.
2.	1.	1
Additional items identified in the field.		
Additional Items.		

If additional items are identified during daily work activities, please notify all relevant personnel about the change and document on this JSA.

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.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☒ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	

☒ Other: Dielectric Overshoes, Sun Block

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
1. Transport equipment to work area	1. Back/strain 2. Slip/Trip/Falls 3. Traffic 4. Cuts/abrasions/contusions from equipment 5. Accidents due to vehicle operations	1. Use proper lifting techniques/Use wheeled transport 2. Minimize distance to work area/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, Langan approved safety shoes) 5. Observe posted speed limits/ Wear seat belts at all times
2. Traffic	1. Hit by moving vehicle	1. Use traffic cones and signage/ Use High visibility traffic vests and clothing/ Caution tape when working near active roadways.
3. Field Work (drilling, resistivity testing, and inspection)	1. Biological Hazards: insects, rats, snakes, poisonous plants, and other animals 2. Heat stress/injuries 3. Cold Stress/injuries 4. High Energy Transmission Lines 5. Underground Utilities 6. Electrical (soil resistivity testing)	1. Inspect work area to identify biological hazards. Wear light colored long sleeve shirt and long pants/ Use insect repellant 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. 2. Wear proper clothing (light colored)/ drink plenty of water/ take regular breaks/use sun block 3. Wear proper clothing/ dress in layers/ take regular breaks. 4. Avoid direct contact with high energy transmission lines/ position equipment at least 15 feet or as required by PSE&G from the transmission lines/ wear proper PPE (dielectric overshoes 15 kV minimum rating). 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

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
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	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 were 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.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

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 preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☐ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Unpack/Transport equipment to work area.	6. Back Strains 7. Slip/Trips/Falls 8. Cuts/Abrasions from equipment 9. 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).
6. Initial Site Arrival-Site Assessment	1. Traffic	1. Situational awareness (be alert of your surroundings). Secure area from through traffic.
7. Surface Water Sampling	1. Contaminated media. Skin/eye contact with biological agents and/or chemicals.	1. Wear appropriate PPE (Safety glasses, appropriate gloves). Review (M)SDS for all chemicals being.
8. Sampling from bridges	1. Struck by vehicles	1. Wear appropriate PPE (Safety Vest). Use buddy system and orange safety cones.
9. 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)
10. 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.
11. 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.)	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

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	17. High Noise levels 18. Overhead hazards 19. Heat Stress/ Cold Stress 20. Eye Injuries	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 repellant / Use bug spray when needed 23. Wear hearing protection 24. Wear hard hat / Avoid areas were 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.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Geophysical Investigation

JSA Number: JSA023-01

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.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
12. Transport equipment to work area	10. Back/strain 11. Slip/Trip/Falls 12. Traffic 13. Cuts/abrasions/contusions from equipment	10. Use proper lifting techniques/Use wheeled transport 11. Minimize distance to work area/unobstructed path to work area/follow good housekeeping procedures 12. Wear proper PPE (high visibility vest or clothing) 13. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes)
13. Supervision of subcontractor and all other activities	2. Slip/Trips/Falls 3. Hand injuries 4. Foot injuries 5. Back injuries/Strains 6. Traffic 7. Wildlife a. Wildlife b. Mice/rats c. Vectors (i.e. mosquitoes, bees, etc.) 7. Heat/Cold Stress	2. Be aware of potential trip hazards/follow good housekeeping procedures/mark significant below-grade hazards (i.e. holes, trenches, wires, ropes) with safety cones or spray paint. 3. Wear proper PPE (leather gloves)/watch wear you place your hands/inspect material or equipment for jagged, rough or slippery surfaces/ watch for pinch points/ wipe off slippery, wet, or dirty items prior to handling. 4. Wear proper PPE (Langan approved safety shoes)/ Be aware of uneven terrain) 5. Use proper lifting techniques/ Buddy system when lifting/ use wheeled transport. 6. Wear proper PPE (high-visibility shirts and vests)/ use cones if appropriate/ notify equipment operators of work area. 7. Be aware of surroundings at all times for the presence of wildlife. a. Do not approach stray animals b. Carry animal repellant/ use if situation arises. c. Use bug spray when needed. 7. Wear proper attire for weather conditions (sunscreen, protective clothing in sunlight or layer clothing in cold weather)/ drink plenty of fluids/ take regular breaks.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
14. 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. High Noise levels 28. Overhead hazards 29. Heat Stress/ Cold Stress 30. Eye Injuries	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 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 repellant / Use bug spray when needed 33. Wear proper hearing protection 34. Wear hard hat / Avoid areas were 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.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

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.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☐ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
15. Transport equipment to work area	14. Back Strain 15. Slips/ Trips/ Falls 16. Traffic 17. Cuts/abrasions from equipment 18. 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)
16. Moving equipment to its planned location	8. Pinch Hazard 9. 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
17. Equipment Set-up	2. Pinch Hazard 3. Cuts/abrasions to knuckles/hands 4. Back Strain	1. Wear proper PPE (leather gloves) 2. Wear proper PPE (leather gloves) 3. Use proper lifting techniques / Use wheeled transport
18. 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

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
4. All activities (cont'd)		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 were 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.)		

Print Name	**Sign Name**	**Date**
Prepared by:		
Reviewed by:		

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.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☐ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☒ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Tyvek Sleeves				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
19. Transport equipment to work area	19. Back Strains 20. Slips/Trips/Falls 21. Traffic 22. Cuts/Abrasions/Contusions from equipment	14. Use proper lifting techniques/ Use wheeled transport/ use buddy system when lifting equipment. 15. Minimize distance from work area/ unobstructed path to collection points and vehicle/ Follow good housekeeping procedures. 16. Wear high-visibility vest or clothing/Exercise caution/ Use traffic cones or signage if needed. 17. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes).
20. Measure depth of water	10. Exposure to hazardous substances 11. Pinched fingers	8. Wear proper PPE (Nitrile gloves, Safety glasses/Face shield). 9. Wear proper PPE (cut-resistant gloves).
21. Install Tremie pipe in the monitoring well and connect to water source.	5. Hand injuries during installation (pinched fingers/hands). 6. Back strain from holding Tremie pipe. 7. High pressure water spray.	2. Wear proper PPE (Nitrile gloves/cut-resistant gloves). 3. Use proper lifting techniques/ Use two personnel when lowering pump greater than 80 feet. 4. Ensure all hose connections are tight and secure/ Use proper PPE (face shield and safety glasses).
22. 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 (generator)	2. Hand injuries during pump installation and sample tubing cutting. 3. Back strain 4. Electric shock 5. Exhaust gases from generator 6. Burns from hot equipment	2. Wear proper PPE when installing pump and cutting sample tubing (Nitrile and cut-resistant gloves)/ Use tubing cutter. 3. 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. 4. Ensure equipment is (LO/TO: locked out/tagged out) prior to preforming any electrical connections/ Inspect wires for frays or cuts/Ensure generator is properly grounded prior to starting. 5. Position generator so that exhaust is flowing away from work area.

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
e. Turn on power source (generator)		6. 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)
23. 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.	41. Hand injuries 42. Face injuries 43. Contaminated spray from water	47. Wear proper PPE (cut-resistant gloves and nitrile gloves). 48. Wear proper PPE (face shield and safety glasses)/do not stand over well opening. 49. 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.
24. 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.
25. 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. 50. Wear proper PPE (leather gloves, long sleeves, Langan approved safety shoes).
26. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 44. Back injuries 45. Traffic 46. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.) 47. High Noise levels 48. Overhead hazards 49. Heat Stress/ Cold Stress 50. 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 repellant / 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 in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
		10. Wear safety glasses.
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

LANGAN

Job Safety Analysis (JSA)
Health and Safety

JSA Title: Direct-Push Soil Borings
JSA Number: JSA004-01

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.

PERSONAL PROTECTIVE EQUIPMENT REQUIRED:				
☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☒ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Half-face respirator, dust cartridges, PID (if applicable)				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
27. Move equipment to work site	23. Back strain when lifting equipment 24. Slips/ Trips/ Falls while moving equipment 25. Traffic (if applicable) 26. Pinched fingers or running over toes during geoprobe set-up 27. Overturn drilling rig while transporting to loading dock on flat-bed tow truck	18. 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 19. 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 20. Wear high visibility safety vests or clothing / Exercise caution 21. Wear proper PPE (cut-resistant gloves) / Stay alert, be aware of geoprobe rig at all times 22. 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
28. Calibration of monitoring equipment	12. Skin or eye contact with calibration chemicals 13. Pinch fingers in monitoring equipment	10. Wear proper PPE (safety glasses/ goggles) 11. Wear proper PPE (leather gloves)
29. Set-up geoprobe rig	8. Geoprobe rig movement	5. All field personnel should stay clear of the geoprobe rig while moving / Use a spotter when backing up the geoprobe
30. Advance geoprobe rods below ground surface to desired depth	7. Underground utilities 8. High noise levels	7. Clean all subsurface soil borings to a minimum of 5 feet below grade 8. Wear proper PPE (hearing protection)
31. Remove and open acetate liner	51. Pinched fingers while removing macrocore 52. Cuts/lacerations when cutting acetate liner open 53. Exposure to hazardous vapors	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

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
5. Remove and open acetate liner (cont'd)	54. Skin contact with contaminated soil	4. Wear proper PPE (nitrile gloves)
32. Sample Collections a) Monitor parameters b) Prepare sample containers and labels	1. Contact with potentially contaminated soil 2. Lacerations from broken sample bottles 3. Back strain while transporting full coolers 4. Internal exposure to contaminants and metals through inhalation of dust 5. Slips/ Trips/ Falls	1. Use monitoring devices / Wear proper PPE (safety glasses, nitrile gloves) 2. Do not over-tighten bottle caps / Handle bottles safely to prevent breakage 9. Use proper lifting techniques / Do not lift heavy loads without assistance 10. Avoid creating dust / If necessary, wear a half mask respirator with applicable dust cartridge / Inspect respirator for damage and cleanliness prior to use / Clean respirator after each use and store in a clean, secure location 11. Be alert / Follow good housekeeping procedures
33. 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)
8. 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	51. Use drum cart for moving drums / Use proper lifting techniques / Do not lift heavy loads without assistance 52. Wear proper PPE (cut-resistant or leather gloves) 53. Wear proper PPE (cut-resistant or leather gloves) 54. Wear proper PPE (nitrile gloves underneath work gloves) 55. Follow good housekeeping procedures / Ensure route to move drum and storage space is free from obstructions 56. Wear proper PPE (safety shoes) / Work in a safe manner to prevent dropped drum
9. 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	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 repellant / 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 in sunlight, layers for cold weather) / Drink plenty of fluids to avoid dehydration / Takes breaks as necessary to avoid heat/cold stress

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
9. All activities (cont'd)	10. Eye Injuries	10. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

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 preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☒ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☒ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☐ Traffic Cones/Signs	☐ Life Vest/Jacket	
☒ Other: Tyvek sleeves, Dermal Protection, PID				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
34. Transport equipment to work area	1. Back Strain 2. Slips/ Trips/ Falls 3. Traffic 4. Cuts/abrasions from equipment 5. 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)
35. Remove well cover	14. Scrape knuckles/hand 15. Strain wrist/bruise palm 16. Pinch fingers or hand	3. Wear proper PPE (leather gloves) 4. Using a hammer, tap the end of the wrench to loosen grip of bolts 5. Wear proper PPE (leather gloves)
36. Remove well cap and lock	9. Well can pops from pressure 10. Exposure to hazardous substances through inhalation or dermal exposure 11. Scrape knuckles/hand 12. Strain write/bruise palm	5. Remove cap slowly to relieve pressure / Do not place face over well when opening / Wear proper PPE (safety glasses) 6. Use direct air monitoring/reading instrument (i.e. PID) / Be familiar with and follow actions prescribed in the HASP / Wear proper PPE (nitrile gloves) 7. Wear proper PPE (leather gloves) 8. Using hammer, tap the end of the wrench to loosen grip
37. Measure head-space vapor levels	1. Exposure to hazardous substances through inhalation	1. Do not place face over well when collecting measurement
38. Remove dedicated tubing (if necessary)	1. Exposure to hazardous substances through inhalation or dermal exposure 2. Tubing swings around after removal	1. Wear proper PPE (nitrile gloves, Tyvek sleeves) 2. Wear proper PPE (safety glasses)
39. Set-up plastic sheeting for work site around the well	1. Lacerations when cutting plastic sheeting	1. Use scissors to cut plastic sheeting / Cut motions should always be away from body and body parts
40. Measure depth to water	1. Exposure to hazardous substances through inhalation or dermal exposure 2. Pinch fingers or hand in water level instrument	1. Wear proper PPE (nitrile gloves) 2. Wear proper PPE (leather gloves)

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
41. Calibrate monitoring equipment	1. Skin or eye contact with calibration chemicals 2. Pinch fingers or hand in monitoring equipment	1. Wear proper PPE (safety glasses, nitrile gloves) 2. Wear proper PPE (leather gloves) / Avoid pinch points
42. Install sampling pump in well	1. Hand injuries during installation of pump 2. Lacerations when cutting tubing 3. Back strain during installation of pump 4. Physical hazards associated with manual lifting of heavy equipment 5. Back strain from starting generator 6. Burns from hot exhaust from generator 7. Electrical shock from improper use of generator and pump 8. Contaminated water spray from loose connections	1. Wear proper PPE (leather gloves, nitrile gloves) 2. Use safety tubing cutter 3. Use proper lifting techniques 4. Use proper lifting techniques / Use wheeled transport for heavy equipment 5. Use arm when starting generator / Do not over-strain if generator does not start 6. Do not touch generator near exhaust / Use proper handle to carry / Allow generator to cool down before moving 7. Properly plug in pump to generator / Do not allow the pump or generator to contact water / Check for breaks in the cord 8. Check all tubing connections to ensure they are tight and secure
10. Purge water	1. Contact with potentially contaminated groundwater 2. Back strain from lifting buckets of water 3. Tripping potential on sample discharge lines and pump electric line	1. Wear proper PPE (safety glasses, nitrile gloves) 2. Use proper lifting techniques / Use wheeled transport 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
11. Sample water collection	1. Contact with potentially contaminated groundwater through dermal exposure 2. Contact with and burns from acid used for sample preservation 3. Tripping potential on sample discharge lines and pump electric line 4. Lacerations from broken sample bottles 5. Back strain when transporting coolers full of collected samples 6. Slips/ Trips/ Falls	1. Wear proper PPE (safety glasses, nitrile gloves) 2. Wear proper PPE (safety glasses, nitrile gloves) / Ensure sample bottle lids are secure before use and after sample collection 3. Organize line to keep out of the way as much as possible / Mark potential tripping hazards with caution tape or safety cones 4. Do not over-tighten bottle caps / Handle bottles safely to prevent breakage / Wrap glass bottles in bubble wrap, if possible 5. Use proper lifting techniques / Use wheeled transport / Seek assistance if coolers weight exceeds 50lbs. / Minimize distance to vehicle 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
12. Remove pump and pack up equipment	1. Back strain when removing pump or lifting heavy equipment	1. Use proper lifting technique / Use wheeled transport for heavy equipment
13. Replace well cap and lock	1. Scrape fingers/hand 2. Strain wrist/bruise palm	1. Wear proper PPE (leather gloves) 2. Using hammer, tap the end of the well cap to tighten grip
14. Replace well cover	1. Scrape knuckles/hand 2. Strain write/bruise palm 3. Pinch fingers or hand	1. Wear proper PPE (leather gloves) 2. Using hammer, tap the end of the wrench to tighten the grip of the bolts 3. Wear proper PPE (leather gloves)
15. Transport drums to disposal staging location	1. Back, arm or shoulder strain from moving drums 2. Pinch hazard 3. Contact with potentially contaminated groundwater when moving improperly sealed drums 4. Slips/ Trips/ Falls when moving drum 5. Drop drum on feet/toes	1. Use drum cart for moving drums / Use proper lifting techniques / Obtain assistance, if needed 2. Wear proper PPE (leather gloves) 3. Wear proper PPE (nitrile gloves under leather gloves) / Properly seal drum to prevent leak 4. Ensure route to move drum to storage space is dry and free from obstructions 5. Wear proper PPE (safety shoes)

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
16. Place used PPE in designated disposal drum	1. Pressure build-up inside drum 2. Pinch hazard	1. Remove cap from bung hole in drum to relieve pressure 2. Wear proper PPE (leather gloves)
17. Decontaminate equipment	1. Splashing water/soap from decontamination 2. Contact with potentially contaminated groundwater 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
18. All activities	55. Slips/ Trips/ Falls 56. Hand injuries, cuts or lacerations during manual handling of materials 57. 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	57. Be aware of potential trip hazards / Follow good housekeeping procedures/ Mark significant hazards 58. 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 59. Wear Langan approved safety shoes 60. 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 61. Wear high visibility clothing & vest / Use cones or signs to designate work area 62. 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 63. Wear hearing protection 64. Wear hard hat / Avoid areas were overhead hazards exist. 65. 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 66. Wear safety glasses
Additional items.		
Additional Items identified while in the field. (Delete row if not needed.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

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 preventive/corrective actions.

PERSONAL PROTECTIVE EQUIPMENT (Required or to be worn as needed):

☒ Safety Shoes	☒ Long Sleeves	☐ Safety Vest (Class 2)	☒ Hard Hat	☒ Hearing Protection
☒ Safety Glasses	☐ Safety Goggles	☐ Face Shield	☒ Nitrile Gloves	☐ PVC Gloves
☒ Leather Gloves	☐ Cut Resist. Gloves	☐ Fall Protection	☐ Fire Resistant Clothing	☐ Rubber Boots
☐ Insect/Animal Repellent	☐ Ivy Blocker/Cleaner	☒ Traffic Cones/Signs	☐ Life Vest/Jacket	
☐ Other:				

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
43. Unpack/Transport equipment to work area.	28. Back Strains 29. Slip/Trips/Falls 30. Cuts/Abrasions from equipment 31. Contusions from dropped equipment	23. Use proper lifting techniques/Use wheeled transport 24. Minimize distance to work area/Unobstructed path to work area/follow good housekeeping procedures. Mark slip/trip/fall hazards with orange safety cones. 25. Wear proper PPE (leather gloves, long sleeves). 26. Wear proper PPE (Langan approved safety shoes).
44. Initial Site Arrival-Site Assessment	17. Traffic	12. Situational awareness (be alert of your surroundings). Secure area from through traffic.
45. Surface Water Sampling	13. 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.
46. Sampling from bridges	9. Struck by vehicles	12. Wear appropriate PPE (Safety Vest). Use buddy system and orange safety cones.
47. Icing of Samples/ Transporting coolers/equipment from work area.	65. Back Strains 66. Slips/Trips/Falls 67. Cuts/Abrasions from equipment 68. Pinch/Crushing Hazards.	67. Drain coolers of water. Use proper lifting techniques. Use wheeled transport. 68. Have unobstructed path from work area. Aware of surroundings. 69. Wear proper PPE (Leather gloves, long sleeves) 70. Wear proper PPE (Leather gloves, long sleeves)
48. 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.
49. All activities	1. Slips/ Trips/ Falls 2. Hand injuries, cuts or lacerations during manual handling of materials 3. Foot injuries 4. Back injuries 69. Traffic 70. Wildlife: Stray dogs, Mice/rats, Vectors (i.e. mosquitoes, bees, etc.)	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

JOB STEPS	POTENTIAL HAZARDS	PREVENTATIVE / CORRECTIVE ACTION
	71. High Noise levels 72. Overhead hazards 73. Heat Stress/ Cold Stress 74. Eye Injuries	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 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.)		

Print Name	Sign Name	Date
Prepared by:		
Reviewed by:		

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 C

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

for

203-207 VAN SICLEN AVENUE
Brooklyn, New York
NYSDEC BCP Site No. C224285

Prepared For:

Van Siclen Realty LLC
60 Lyman Place
Staten Island, New York 10304

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

April 5, 2019
Langan Project No. 170513001

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ATTACHEMENTS

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

Van Siclen Realty LLC entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on January 16, 2019, to investigate and remediate an about 10,000-square-foot property located at 203-207 Van Siclen Avenue in the East New York section of Brooklyn, New York (the "Site"). NYSDEC assigned Brownfield Cleanup Program (BCP) Site No. 224285 to the Site. The Site is a vacant lot used for storage of construction equipment. Refer to the Remedial Investigation Work Plan (RIWP) for additional details.

This Quality Assurance Project Plan (QAPP) specifies analytical methods and evaluation procedures to be used to ensure that data from the proposed Remedial Investigation (RI) at the Site are precise, accurate, representative, comparable, and complete.

1.2 PROJECT OBJECTIVES

The environmental objective of this project is to investigate and characterize the nature and extent of contamination, per Environmental Conservation Law Article 27, Title 14 (Brownfield Legislation) which includes the following proposed activities:

- The advancement and sampling of soil borings;
- The installation, sampling, and synoptic gauging of five monitoring wells; and
- The installation and sampling of soil vapor probes.

These objectives have been established, in consideration of existing historical data, to support the evaluation of potential remedial actions for the Site.

1.3 SCOPE OF WORK

The specific scope of work for this site remedial investigation is described in detail in the RIWP.

The following activities will be performed as part of the RI:

- <u>Soil Borings and Sampling</u>
    - Advancement of 17 soil borings (SB11 through SB28) to depths of about 6 bgs to 45 feet bgs.
    - Collection of at least 2 soil samples from borings SB15, SB22, SB27, and SB28 for a total of up to 6 soil samples (plus quality assurance/quality control [QA/QC] sampling).

- The remaining borings (SB11 – SB14, SB16 – SB17, SB18 – SB21, and SB23 – SB26) will be advanced to delineate higher concentrations of metals and PAHs. Three samples will be collected from each delineation boring for a total of 28 samples (plus QA/QC samples).

- Monitoring Well Installation and Sampling
  - Installation of five monitoring wells (MW11, MW16, MW18, MW26, and MW27) co-located with soil boring locations. The five wells will be installed to about 45 feet bgs and screened across the groundwater table.
  - Collection of one groundwater samples from each monitoring well for a total of five groundwater samples (plus QA/QC sampling).
  - Survey and synoptic gauging of monitoring wells to evaluate flow and groundwater contours.
- Soil Vapor Point Installation and Sampling
  - Installation of six soil vapor probes (SV11, SV16, SV18, SV22, SV26, and SV27) to the proposed development depth (12 – 15 feet bgs) and collection of one soil vapor sample from each probe for a total of six soil vapor samples.
  - One outdoor ambient air sample will be collected as a QA/QC measure and for comparison.

1.4 DATA QUALITY OBJECTIVES AND PROCESSES

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 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 coded duplicate samples and analytical precision will be determined by analyzing internal QC duplicates and 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. Sampling 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. For soil vapor samples, analytical accuracy will be assessed by examining the percent recoveries that are added to each sample, internal standards, laboratory method blanks, and instrument calibration.
- **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 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, instrument calibrations, 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 QA personnel, sampling and analytical procedures that achieve the required levels of detection.

The above objectives are discussed in detail in Section 3.0.

2.0 PROJECT ORGANIZATION

The RI will be overseen by Langan on behalf of Van Siclen Realty LLC. Langan will oversee the advancement of soil borings, installation of monitoring wells, installation of soil vapor probes and off-site disposal of investigation-derived waste. Langan will collect soil, groundwater, and soil vapor samples as outlined by the RIWP.

The analytical services will be performed by York Analytical Laboratories (York), which is an environmental laboratory approval program (ELAP) certified facility. York's NYSDOH certification number for their Queens facility is 12058.

Key contacts for this project are summarized below; Langan resumes are included in Attachment A:

Personnel	Investigation Role	Contact Information
Michael D. Burke, P.G., CHMM Langan Engineering	Langan Project Manager	Phone – 212-479-5413 Email – mburke@langan.com
Jason Hayes, P.E. Langan Engineering	Langan Quality Assurance Officer (QAO)	Phone – 212-479-5427 Email – jahayes@langan.com
Jennifer Armstrong Langan Engineering	Program Quality Assurance Monitor	Phone – 212-479-5537 Email – jarmstrong@langan.com
Emily Strake Langan Engineering	Data Validator / Program Quality Assurance Manager	Phone – 215-491-6500 Email – estrake@langan.com
Richard August York Analytical Laboratories	Laboratory Representative	Phone – 203-325-1371, ext. 834 Email – raugust@yorklab.com

3.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) OBJECTIVES FOR MEASUREMENT OF DATA

The 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.

3.1 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 2x the reporting limit (RL) meet the precision criteria if the absolute difference is less than ±2x the RL. For results greater than 2x the RL, the acceptance criteria is a relative percent difference (RPD) of ≤50% (soil and canister air), and <30% (groundwater). RLs and method detection limits (MDL) are provided in Attachment B.

3.2 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 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 will be considered for non-aqueous matrices where high concentrations of VOCs are anticipated based on field screening.

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.

3.3 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 analytical methods, laboratory-issued SOPs, the laboratory's Quality Assurance Manual, and this QAPP. The laboratory is required to be properly certified and accredited.

3.4 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.

Soil vapor, soil, and 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.

3.5 COMPARABILITY

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). 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 U.S. Environmental Protection Agency (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.

3.6 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 B. The frequency of associated field blanks and duplicate samples will be based on the recommendations listed in the Division of Environmental Remediation (DER)-10, and as described in Section 4.10

Site-specific MS and 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 soil and groundwater samples.

4.0 SAMPLING PROGRAM

4.1 INTRODUCTION

The sampling program will provide:

- Sampling of soil within areas of concern (AOC) 1 through 5;
- Groundwater sampling from 5 new monitoring wells;
- Soil vapor sampling from six soil vapor sampling probes; and
- Sampling of investigation-derived waste that will be removed and disposed of off-site, as needed.

This section presents sample container preparation procedures, sample preservation procedures, sample holding times, and field QC sample requirements.

4.2 SAMPLE COLLECTION

4.2.1 Soil Sampling

Delineation Borings

Delineation borings (SB11 – SB14, SB16 – SB17, SB18 – SB21, and SB23 – SB26) will be advanced to the development depth or native soil, whichever is deeper. Three grab samples will be collected from each delineation boring from the 0 - 2, 2 - 4, and 4 – 6-foot depth intervals and analyzed for the contaminant of concern associated with each AOC. The 0 - 2-foot samples will be authorized for analysis upon sampling, but the other samples will be held at the laboratory pending results of the shallow samples. A separate sample will be collected from the top of native material within borings SB14, SB17, SB21, and SB26 for analysis of the full parameter list in Section 3.2.2 and shown in Table 1.

Site-wide Investigation Borings

Up to 4 grab soil samples will be collected from borings SB15, SB22, SB27, and SB28 to evaluate site-wide AOC 5. Within each of these borings, up to 3 samples will be collected from historic fill material. If visible, olfactory, or instrumental evidence of contamination is not observed, representative samples of historic fill material will be collected. If gross impacts are observed, sample will be collected from the interval of greatest apparent impact and from the first occurrence of soil that is not visibly impacted. One sample will be collected from the first occurrence of native soil or the development depth, whichever is deeper.

In the event that environmental impacts (i.e., visual observations, odors or PID readings above background) are apparent at the proposed terminal depth, soil borings will be advanced until refusal or until impacts are no longer apparent. Non-disposable down-hole drilling equipment and

sampling apparatus will be decontaminated between locations with Alconox® and water. Following sampling, each soil boring that is not completed with a groundwater monitoring well will be backfilled using excess (non-impacted) soil cuttings and/or bentonite grout.

Soil samples will be collected in laboratory-supplied containers and will be sealed, labeled, and placed in a cooler containing ice (to maintain a temperature of approximately 4 degrees Celsius) for delivery to York Analytical Laboratory (York), an NYSDOH Environmental Laboratory Approval Program (ELAP)-certified analytical laboratory, or another NYSDOH ELAP-certified lab.

Analysis

Soil samples will be analyzed for the following analyses:

- AOC 1: NYSDEC Part 375 SVOCs (PAHs) via USEPA Method 8270D;
- AOC 2: NYSDEC Part 375 metals (USEPA Method 6010D) and TCLP metals (if necessary)
- AOC 3: NYSDEC Part 375 metals (USEPA Method 6010D) and TCLP metals (if necessary)
- AOC 4 : NYSDEC Part 375 metals (USEPA Method 6010D) and TCLP metals (if necessary)
- AOC 5: NYSDEC Part 375/TCL VOCs (USEPA Method 8260C), SVOCs (USEPA Method 8270D), PCBs (USEPA Method 8082A), pesticides (USEPA Method 8081B), herbicides (EPA Method 8260C), metals (USEPA Method 6010C/7000 series, including hexavalent and trivalent chromium), and total cyanide (USEPA Method 9010C/9014), and per- and polyfluoroalkyl substance (PFAS/PFOS) by EPA Method 537M (2009).

4.2.2 Groundwater Samples

One groundwater sample will be collected from each of the five monitoring wells (MW11, MW15, MW18, MW26, and MW25). Prior to sampling, Langan will document static water levels during a synoptic gauging event. 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 oxidation-reduction-potential (ORP), every ten five minutes using a water quality meter (YSI 6820 or similar) and a depth-to-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 ±0.1 standard units for pH, ±3% for conductivity and temperature, ±10 millivolts for ORP, and ±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. 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.

Groundwater samples will be analyzed by York for NYSDEC Part 375/TCL VOCs, SVOCs, Pesticides, PCBs, herbicides, and total/dissolved (field-filtered) metals (including hexavalent and total chromium). Groundwater samples will also be analyzed for 1,4-dioxane by USEPA Method 8270D SIM and the per- and polyfluoroalkyl compounds (PFCs) target analyte list (Section 4.6).

Groundwater samples collected for 1,4-dioxane will be analyzed with a detection limit no higher than 0.2 micrograms per liter. Groundwater samples collected for analysis of PFAS will be collected in accordance with the specialized protocol outlined in Section 4.4. Groundwater samples collected for PFAS will be analyzed with a detection limit no higher than 2 nanograms per liter.

4.2.3 Soil Vapor Sampling

Whole air samples will be sampled in 2.7-L passivated, leak-free stainless steel canisters. The canisters will be equipped with a laboratory-preset flow controller, pressure gauge, critical orifice, and stainless steel frit dust filter. Canisters will be shipped to the Site at sub-atmospheric pressure approximating negative 30 inches of mercury and at ambient temperature. Soil vapor samples will be collected in batch certified-clean Summa® canisters calibrated for a sampling rate of two hours. The pressure gauges on each calibrated flow controller should be monitored throughout sample collection. Sample collection should be stopped when the pressure reading reaches -4 mmHg.

As a QA/QC measure, an inert tracer gas (helium) will be introduced into an above-grade sampling chamber to ensure that the soil vapor sampling points are properly sealed above the target sampling depth, thereby preventing subsurface infiltration of ambient air. Prior to sampling, three probe/tubing assembly volumes will be purged from each point using a multi-gas monitor at a rate of less than 0.2 liters per minute. The multi-gas monitor will also be used to screen the soil vapor for the presence of VOCs. Following purging, each soil vapor point will be sampled using laboratory-provided, 2.7-liter air canisters equipped with 2-hour sample interval flow controllers. Soil vapor samples will be analyzed by York for VOCs by USEPA Method TO-15.

4.3 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 boring logs, which will be used for geologic and drilling data during soil boring activities. 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.

4.4 SAMPLE CONTAINER PREPARATION AND SAMPLE PRESERVATION

Sample containers will be properly washed and decontaminated prior to their use by either the analytical laboratory or the container vendor to the specifications required by the USEPA. Copies of the sample container QC analyses will be provided by the laboratory for each container lot used to obtain samples. The containers will be labeled and the appropriate preservatives will be added. The types of containers and preservatives are shown in Attachment B.

Soil and groundwater sampling for PFAS will be collected in accordance with EPA Method 537 Field Sampling Guidelines. PFAS samples will be collected first in High Density Polyethylene (HDPE)/polypropylene containers using sampling equipment either made with stainless steel, HDPE, or polypropylene. Food and beverages will be prohibited near the sampling equipment. Additionally, no cosmetics, moisturizers, hand cream, sun screen or clothing materials containing Gore-Tex™ or Tyvek® will be worn during sampling.

Preservatives will be added to the sample bottles by the laboratory prior to their shipment in sufficient quantities to ensure that proper sample pH is met. Following sample collection, the sample bottles should be placed on ice in the shipping cooler, cooled to 4^0C with ice or "blue ice", and delivered to the laboratory within 48 hours of collection. Blue ice will not be used to cool PFAS samples. Chain-of-custody procedures are described in Section 5

4.5 SPECIAL CONSIDERATIONS FOR PFAS SAMPLE COLLECTION

The following special considerations apply to the collection of soil and groundwater samples for PFAS analysis to prevent cross-contamination:

- Field equipment will not contain Teflon®
- All sampling material will be made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books will be used
- No plastic clipboards, binders, or spiral hard cover notebooks will be used
- No adhesives will be used
- No sharpies or permanent markers will be used; ball point pens are acceptable
- Aluminum foil will not be used
- PFAS samples will be kept in a separate cooler from other sampling containers
- Coolers will be filled only with regular ice

PFAS compound sampling protocol is provided in Attachment C.

4.6 PFAS TARGET ANALYTE LIST

DER has developed a PFAS target analyte list. At minimum, the laboratory will report the following PFAS target compounds:

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

Group	Analyte Name	Abbreviation	CAS #
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

4.7 SAMPLE HOLDING TIMES

The sample holding times for organic and inorganic parameters are given in Attachment B and must be in accordance with the NYSDEC Analytical Services Protocol (ASP) requirements. The NYSDEC ASP holding times must be strictly adhered to by the laboratory. Any holding time exceedances must be reported to Langan.

4.8 DECONTAMINATION PROCEDURES

Decontamination procedures will be used for non-dedicated sampling equipment. Decontamination of field personnel is discussed in the Health and Safety Plan (HASP) included in Appendix B of the RIWP. 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

Field personnel will wear nitrile gloves while collecting and handling groundwater samples.

4.9 RESIDUALS MANAGEMENT

Debris (e.g., paper, plastic and disposable 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. If applicable, residual solids (e.g., leftover soil cuttings) will be placed back in the borehole from which it was sampled. If gross contamination is observed, soil will be collected and stored in Department of Transportation (DOT)-approved 55-gallon drums in a designated storage area at the Site. The residual materials stored in a designated storage area at the site for further characterization, treatment or 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.

4.10 FIELD QUALITY CONTROL SAMPLES

To assess field sampling and decontamination performance, two types of "blanks" will be collected and submitted to the laboratory for analyses. In addition, the precision of field sampling procedures will be assessed by collecting coded field duplicates and MS/MSDs. The blanks will include:

a. Trip Blanks - A trip blank will be prepared before the sample containers are sent by the laboratory. The trip blank will consist of a 40-ml VOA vial containing distilled, deionized water, which accompanies the other water sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples for Part 375 volatiles analysis. The trip blank will be analyzed for volatile organic compounds to assess any contamination from sampling and transport, and internal laboratory procedures.

b. Field Blanks - Field blanks will be taken at a minimum frequency of one per sample matrix per sampling day. Field blanks are used to determine the effectiveness of the decontamination procedures for sampling equipment. The field blank will consist of a sample of PFAS-free, deionized, distilled water provided by the laboratory that has passed through a decontaminated bailer, tubing or other sampling apparatus. It is usually collected as a last step in the decontamination procedure, prior to taking an environmental sample. The field blank may be analyzed for all or some of the parameters of interest.

c. Coded Field Duplicates - To determine the representativeness of the sampling methods, coded field duplicates will be collected at a minimum frequency of one per 20 field samples. The samples are termed "coded" because they will be labeled in such a manner that the laboratory will not be able to determine that they are a duplicate sample. This will eliminate any possible bias that could arise. The field duplicate precision criteria are provided in Section 3.1.

d. Matrix Spike/Matrix Spike Duplicate - MS/MSD samples (MS/MSD for organics; MS and laboratory duplicate for inorganics) will be taken at a frequency of one pair per 20 field samples. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes. The recovery limits and RPDs for each analyte are statistically derived at the laboratory on an ongoing basis.

5.0 SAMPLE TRACKING AND CUSTODY

5.1 INTRODUCTION

This section presents sample custody procedures for both the field and laboratory. Implementation of proper custody procedures for samples generated in the field is the responsibility of field personnel. Both laboratory and field personnel involved in the Chain-of-custody (COC) and transfer of samples will be trained as to the purpose and procedures prior to implementation.

Evidence of sample traceability and integrity is provided by COC procedures. These procedures document the sample traceability from the selection and preparation of the sample containers by the laboratory, to sample collection, to sample shipment, to laboratory receipt and analysis. The sample custody flowchart is shown in Figure 5.1. A sample is considered to be in a person's custody if the sample is:

- In a person's possession;
- Maintained in view after possession is accepted and documented;
- Locked and tagged with Custody Seals so that no one can tamper with it after having been in physical custody; or
- In a secured area which is restricted to authorized personnel.

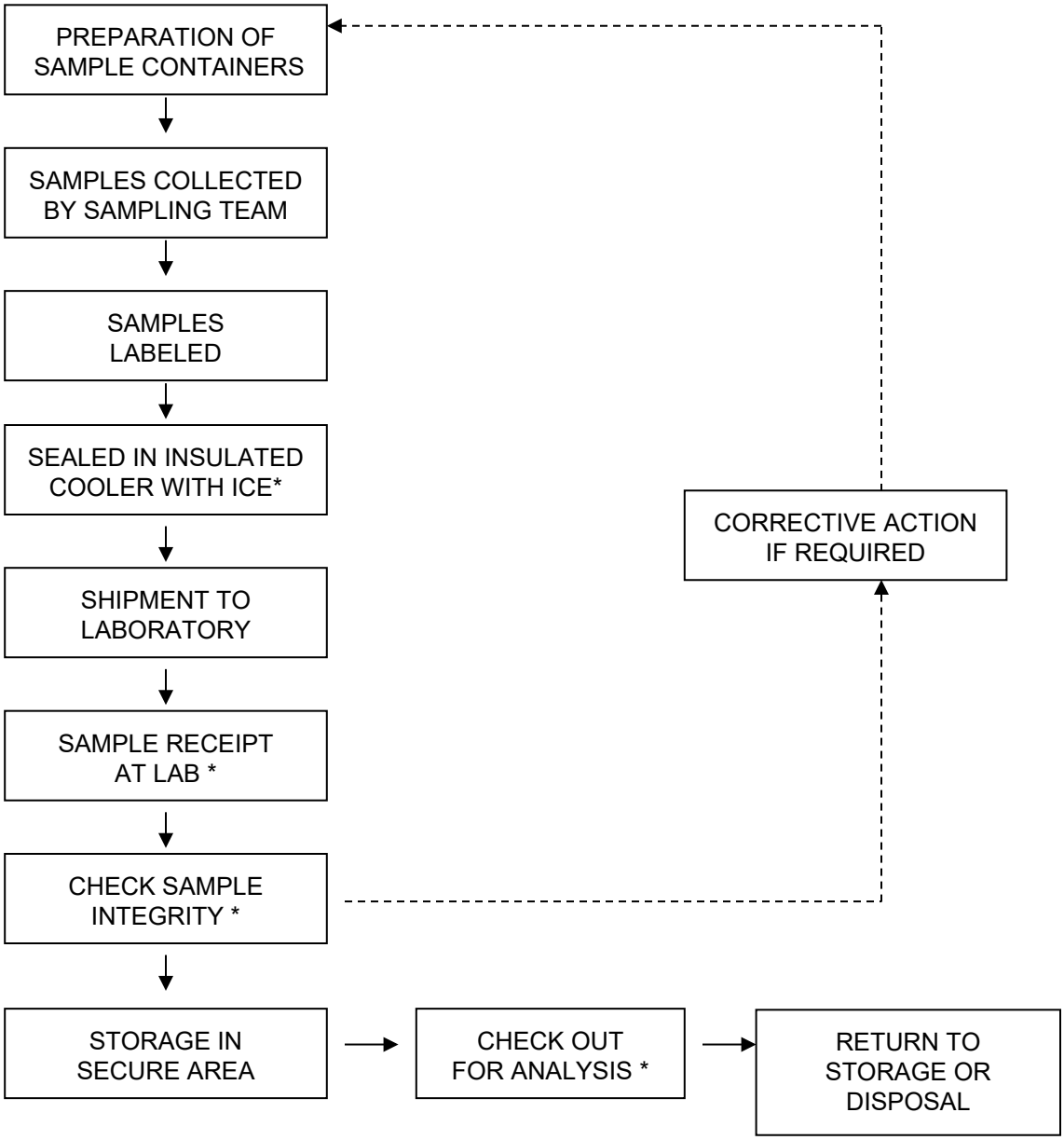
5.2 FIELD SAMPLE CUSTODY

A COC record (Figure 5.2 or similar) accompanies the sample containers from selection and preparation at the laboratory, during shipment to the field for sample containment and preservation, and during return to the laboratory. Triplicate copies of the COC must be completed for each sample set collected.

The COC lists the field personnel responsible for taking samples, the project name and number, the name of the analytical laboratory to which the samples are sent, and the method of sample shipment. The COC also lists a unique description of every sample bottle in the set. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample.

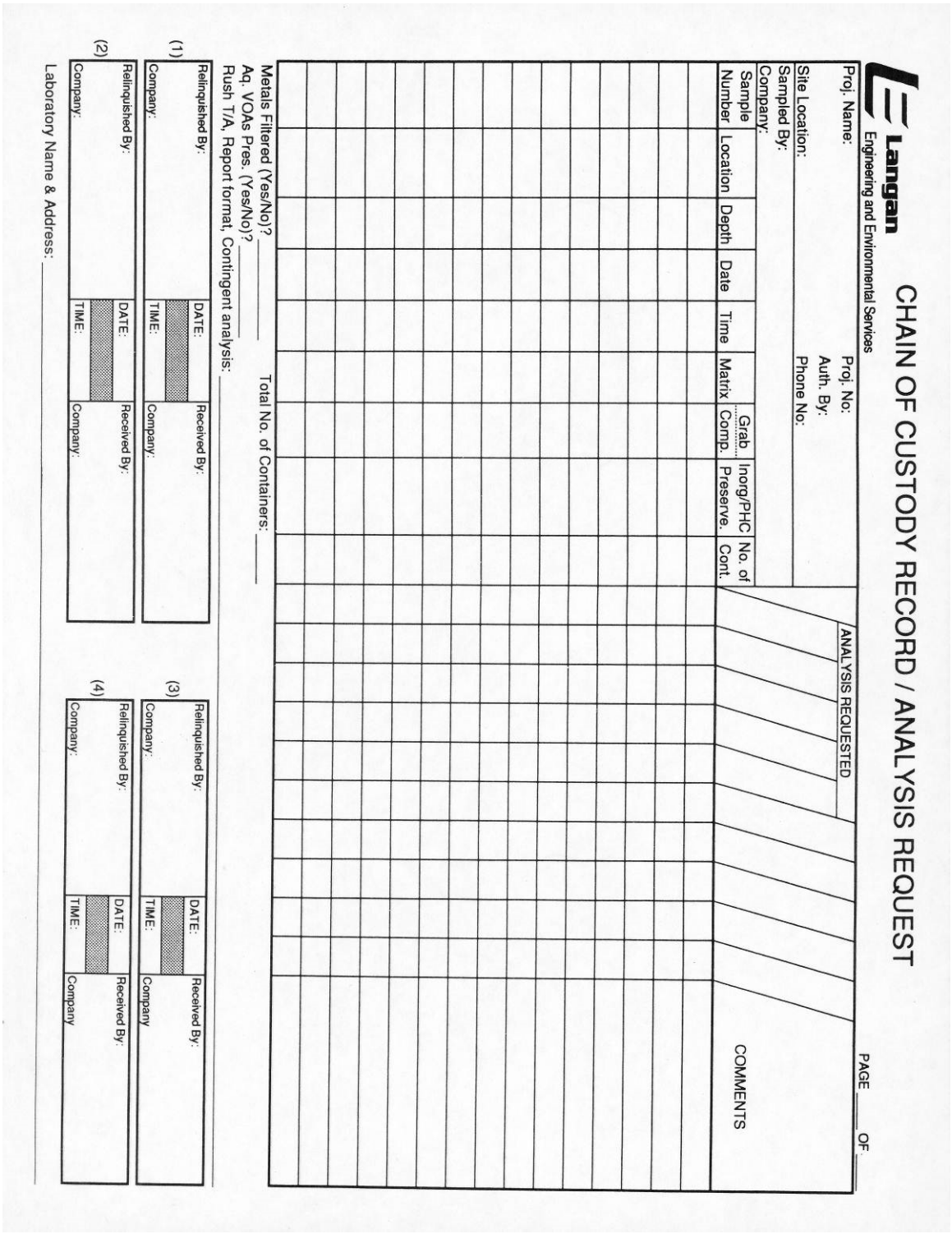
The REMARKS space on the COC is used to indicate if the sample is a MS, MSD, or any other sample information for the laboratory. Since they are not specific to any one sample point, trip and field blanks are indicated on separate rows. Once all bottles are properly accounted for on the form, a sampler will write his or her signature and the date and time on the first RELINQUISHED BY space. The sampler will also write the method of shipment, the shipping cooler identification number, and the shipper airbill number on the top of the COC.

Figure 5.1 - Sample Custody



* REQUIRES SIGN-OFF ON CHAIN-OF-CUSTODY FORM

Figure 5.2 - Sample Chain-of-Custody Form



Mistakes will be crossed out with a single line in ink and initialed by the author.

One copy of the COC is retained by sampling personnel (notations identifying blind duplicate samples will be added to this copy of the COC but not the others that will go to the laboratory) and the other two copies are put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the samples signs their name across the seal. The seal is taped, and the cooler is wrapped tightly with clear packing tape. It is then relinquished by field personnel to personnel responsible for shipment, typically an overnight carrier. The COC 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 sample will not be analyzed.

5.3 LABORATORY SAMPLE CUSTODY

The Project Manager or Field Team Leader will notify the laboratory of upcoming field sampling activities, and the subsequent shipment of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The following laboratory sample custody procedures will be used:

- The laboratory will designate a sample custodian who will be responsible for maintaining custody of the samples, and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check cooler temperature, and check the original COC documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian will sign the COC record and record the date and time received.
- Care will be exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the Project Manager or Field Team Leader as part of the corrective action process. A qualitative assessment of each sample container will be performed to note any anomalies, such as broken or leaking bottles. This assessment will be recorded as part of the incoming chain-of-custody procedure.
- The samples will be stored in a secured area at a temperature of approximately 4°C until analyses commence.
- A laboratory tracking record will accompany the sample or sample fraction through final analysis for control.
- A copy of the tracking record will accompany the laboratory report and will become a permanent part of the project records.

6.0 FIELD INSTRUMENT CALIBRATION AND MAINTENANCE

A photoionization detector (PID) equipped with a 10.6 electron volt bulb will be used during the sampling activities to evaluate work zone action levels, collect pre- and post-sample readings for soil vapor samples, screen soil samples, 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 U52 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. A portable turbidity meter (LaMotte or similar) may also be used to measure turbidity. Water-quality meters should be calibrated and the results documented before use each day using standardized field calibration procedures and calibration checks.

A multi-gas monitor will be used during purging of the soil vapor points and will be used to screen the soil vapor for presence of VOCs. The multi-gas monitor should be calibrated and the results documented before use each day by following the procedures outlined in the operating manual for the instrument.

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.

7.0 DATA REDUCTION, VALIDATION, AND REPORTING

7.1 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 analytical methodology (Attachment B) 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.

7.2 DATA REDUCTION

The 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 ASCII format from the laboratory information management system (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.

7.3 DATA VALIDATION

Data validation will be performed in accordance with the USEPA validation guidelines for organic and inorganic data review. Validation will include the following:

- Verification of the QC sample results,
- Verification of the identification of sample results (both positive hits and non-detects),
- Recalculation of 10% of all investigative sample results, and
- Preparation of Data Usability Summary Reports (DUSR).

A DUSR will be prepared and reviewed by the Quality Assurance Officer (QAO) before issuance. The DUSR will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. A detailed assessment of each SDG will follow. For each of the organic analytical methods, the following will be assessed:

- Holding times;
- Instrument tuning;
- Instrument calibrations;
- Blank results;
- System monitoring compounds or surrogate recovery compounds (as applicable);
- Internal standard recovery results;
- MS and MSD results;
- Target compound identification;
- Chromatogram quality;
- Pesticide cleanup (if applicable);
- Compound quantitation and reported detection limits;
- System performance; and
- Results verification.

For each of the inorganic compounds, the following will be assessed:

- Holding times;
- Calibrations;
- Blank results;
- Interference check sample;
- Laboratory check samples;
- Duplicates;
- Matrix Spike;
- Furnace atomic absorption analysis QC;
- ICP serial dilutions; and
- Results verification and reported detection limits.

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.

7.4 Reporting

Upon receipt of validated analytical results, NYSDEC format EDDs, compatible with EQuIS™, will be prepared and submitted to the NYSDEC.

8.0 QUALITY ASSURANCE, PERFORMANCE, AND SYSTEM AUDITS

8.1 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.

8.2 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 occur.

8.3 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.

8.4 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.

9.0 CORRECTIVE ACTION

9.1 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.

9.2 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 12.1 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 9.1 - Corrective Action Request

CORRECTIVE ACTION REQUEST

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:_____

10.0 REFERENCES

1. NYSDEC. Division of Environmental Remediation. DER-10/Technical Guidance for Site Investigation and Remediation, dated May 3, 2010.

2. NYSDOH. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.

3. USEPA, 2014. "Test Method for Evaluating Solid Waste," Update V dated July 2014 U.S. Environmental Protection Agency, Washington, D.C.

4. USEPA, 2016. Region II Standard Operating Procedure (SOP) #HW-34, "Trace Volatile Data Validation" (September 2016, Revision 1), USEPA Hazardous Waste Support Section. USEPA Region II

5. USEPA, 2016. Region II SOP #HW-35A, "Semivolatile Data Validation" (September 2016, Revision 1), USEPA Hazardous Waste Support Section. USEPA Region II

6. USEPA, 2016. Region II SOP #HW-36A, "Pesticide Data Validation" (October 2016, Revision 1), USEPA Hazardous Waste Support Section. USEPA Region II

7. USEPA, 2015. Region II SOP #HW-37A, "PCB Aroclor Data Validation" (June 2015, Revision 0), USEPA Hazardous Waste Support Section. USEPA Region II

8. USEPA 2015. Region II SOP #HW-3a, "ICP-AES Data Validation" (July 2015, Revision 0), USEPA Hazardous Waste Support Section. USEPA Region II

9. USEPA 2016. 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 September 2016.

10. 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.

11. USEPA 2017b. National Functional Guidelines for Superfund Inorganic Methods Data Review, Office of Superfund Remediation and Technology Innovation, EPA-540-R-201 7-001, January 2017.

APPENDIX D

ANTICPATED PROJECT SCHEDULE