PHASE II ENVIRONMENTAL SITE INVESTIGATION

for

450 Union Street
Brooklyn, New York

Prepared For:

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EXECUTIVE SUMMARY

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) was retained by 450 Union Street, LLC to prepare a Phase II Environmental Site Investigation (ESI) for the property located at 450 Union Street in Brooklyn, New York ("Subject Property"). The Subject Property is identified as New York City Tax Block 438, Lot 7 in the Gowanus neighborhood of Brooklyn. The Subject Property is located on the city block bordered by Union Street to the north, the Gowanus Canal to the east, President Street to the south, and Bond Street to the west. This Phase II ESI has been completed for due diligence associated with a potential real estate transaction involving the Subject Property and to investigate the recognized environmental conditions (RECs) identified in Langan's Phase I Environmental Site Assessment (ESA), dated May 29, 2014.

The approximately 28,500-square-foot (SF) Subject Property contains a 9,880 SF, one-story commercial building and two storage sheds. The exterior portion of the property contains an enclosed area for social events, a parking lot and driveway, and storage areas. A bulkhead consisting of a 12-foot high headwall supported by timber cribbing separates the property from the Gowanus Canal. The site building is divided for use as a private event space, art gallery, and commercial metal working facility. The Subject Property has been utilized for commercial and manufacturing operations since at least 1886, and historically contained a garage (1918 – 1930), foundry (1930 – 2007), and fuel company (1931). The existing building was constructed in approximately 1920.

The Subject Property is underlain by historic fill extending to a minimum depth of 15 ft bgs and consisting of interlayered sand, silt, and clay with varying amounts of gravel, brick, coal, wood and concrete fragments. Based on historical documentation and Langan's experience in this area of Brooklyn, the minimum depth of bedrock in the vicinity of the Subject Property is about 100 feet below grade surface (ft bgs). The depth to groundwater measured during the investigation ranged from approximately 7 to 11 ft bgs. Based on the general topography of the surrounding area, inferred groundwater flow is to the east towards the adjoining Gowanus Canal. The property is covered entirely with impervious surfaces (i.e., concrete floor slabs, asphalt and concrete paving), with the exception of an area of exposed soil on the southeastern portion of the property.

The Phase II ESI included a geophysical survey, the advancement of nine soil borings, installation of temporary monitoring wells in seven of the nine soil borings and three soil vapor sampling points, and the collection and laboratory analysis of 17 grab soil samples, seven

groundwater samples and three soil vapor samples. The findings of the investigation are summarized as follows:

- The geophysical survey did not identify USTs or other suspect buried structures representative of potential environmental concerns. However, the area overlying an inactive gasoline underground storage tank (UST) identified during a previous investigation on the eastern portion of the property was inaccessible during the investigation. Signal interference precluded profiling of the underground vault in the metal working area.
- A soil vapor concentration of 16.4 parts per million (ppm) was field screened at a depth of 7 ft bgs in boring SB-3 on the eastern portion of the Subject Property. Other indications of a petroleum or chemical release to soil (e.g., staining, odors, or elevator soil vapor concentrations) were not encountered during the field investigation.
- Multiple semi-volatile organic compounds (SVOCs), metals, and pesticides were detected at concentrations above the 6 NYCRR Part 375 Unrestricted and Restricted Residential Use Soil Cleanup Objectives (SCOs) in soil samples. In general, the concentrations were typical of background conditions observed in historic fill throughout New York City and were not indicative of impacts from a local source, with the following exceptions:
    - The sample collected from the 7 – 7.5 ft bgs interval in boring SB-3 near the inactive UST contained napththalene and other SVOCs associated with petroleum compounds at concentrations above 100 mg/kg. The petroleum impacts may be associated with a spill originating from the UST.
    - The shallow soil sample collected from boring SB-2 on the central portion of the property contained copper at a concentration above the Part 375 Industrial Use SCO and lead, cadmium, and nickel at concentrations above the Part 375 Commercial Use SCOs. The concentration of lead was above the EPA regulatory level for hazardous waste. The anomalously high metal concetrations at SB-2 may be associated with historical foundry operations at the Subject Property.
- The groundwater sample collected from monitoring well MW-3, which was located near the inactive UST, contained petroleum compounds at concentrations above the NYSDEC regulatory standards. The petroleum impacts may be associated with a

petroleum spill originating from the inactive UST. Indications of environmental impacts were not observed in other groundwater samples.

- Multiple VOCs were detected in the soil vapor samples. However, VOCs were not detected at concentrations above the New York State Department of Health (NYSDOH) Air Guideline Values, and comparison of the results with the NYSDOH Decision Matrices indicated that soil vapor mitigation is not warranted.

The above findings indicate that historical releases from the inactive gasoline UST on the eastern portion of the Subject Property may have adversely impacted soil and groundwater. Petroleum-related compounds were confined to a single boring and monitoring well, suggesting that impacts are localized. These findings are consistent with those of an environmental investigation conducted in 2002.

Historical metal working operations may have impacted shallow soil, based on the results from a single boring in the central portion of the Subject Property. The laboratory results did not provide evidence of contamination originating from off-site sources or the underground vault in the metal working area. In addition, groundwater sampling results from wells MW-5 and MW-6 did not indicate that contaminants originating from the Subject Property are impacting the Gowanus Canal. The following conclusions were made with respect to the potential future redevelopment of the Subject Property:

- The inactive UST should be administratively closed with NYSDEC and removed in accordance with NYSDEC regulations. Removal of the UST may reveal a petroleum spill, which will require reporting, investigation, and remediation per NYSDEC policy.
- Future discovery of VOC-impacted soil or groundwater associated with the inactive UST may warrant the implementation of soil vapor mitigation measures in future building(s) constructed on the property.
- Excess historic fill generated during construction excavation will be categorized as an NYSDEC Part 360 regulated solid waste. Excavated historic fill and native soil should be handled and disposed in accordance with applicable local, state, and federal regulations.
- Should future redevelopment plans require excavation of soil near boring location SB-2, the vertical and lateral extent of hazardous lead soil should be delineated. Additional fees and regulatory reporting are associated with the handling, transport, and disposal of hazardous waste, including an NYSDEC administrative fee of $130/ton and a New York State tax of $27/ton.

1.0 INTRODUCTION

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) conducted a Phase II Environmental Site Investigation (ESI) for the property located at 450 Union Street (Block 438, Lot 7) in Brooklyn, New York ("Subject Property"). The Phase II ESI was conducted on behalf of 450 Union LLC to investigate potential impacts from recognized environmental conditions identified in Langan's Phase I Environmental Site Assessment (ESA), dated May 29, 2014.

The field investigation was conducted from May 6 through May 13, 2014 and consisted of a geophysical survey, advancement of soil borings, installation of temporary monitoring wells and soil vapor sampling points, and the collection of soil, groundwater and soil vapor samples for laboratory analysis.

1.1 Site Location and Description

The Subject Property occupies approximately 28,500 square feet (SF) in the Gowanus neighborhood of Brooklyn. The Subject Property contains a 9,880-SF commercial building and two storage sheds. The exterior portion of the property contains an enclosed area for social events, a parking lot and driveway, and storage areas. A bulkhead consisting of a 12-foot high headwall supported by timber cribbing separates the property from the Gowanus Canal. The site building is currently divided for use as a private event space, art gallery, and commercial metal working facility.

The Subject Property is located on the city block bordered by Union Street to the north, the Gowanus Canal to the east, President Street to the south, and Bond Street to the west. Mixed-use industrial, manufacturing, commercial, retail, and residential buildings characterize the surrounding area. A Site location Map is included as Figure 1.

1.2 Previous Environmental Investigations

Phase II Site Investigation Report (460 Union Street), dated May 2002, prepared by AKRF, Inc.

AKRF, Inc. prepared a Phase II Site Investigation Report (SIR) of the Subject Property on behalf of The Corcoran Group in May 2002. The report included review of an October 2001 Phase I ESA and June and July 2001 Phase II SIR prepared by New York Petroleum & Drilling Corp. (NYPDC). AKRF's investigation consisted of soil sampling from five on-site and two off-site soil borings and groundwater sampling from one on-site and one off-site monitoring well. All borings were completed to 12 feet below surface grade, with the exception of two that were

extended to 16 feet below surface grade to accommodate monitoring well installation. The investigation yielded the following findings:

- Magnetic anomalies indicative of a 550-gallon underground storage tank (UST) adjacent to a stained and cracked concrete pad located on the southeastern portion of the Subject Property.
- Analytical laboratory analytical results indicating volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals and pesticides in soil samples. SVOCs were detected throughout the site at concentrations exceeding the current 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs). The highest SVOC concentrations (i.e., > 100 parts per million) were detected in a sample collected from 3 to 5 feet below surface grade near the suspected UST. AKRF concluded that the highest detected SVOC concentrations in the vicinity of the tank were indicative of a potential petroleum release. The SVOC concentrations in other samples were attributed to background conditions in the historic urban fill. Metals and pesticides were detected at concentrations that exceeded the current Part 375 Unrestricted Use SCOs, but were within the range commonly observed in historic fill. PCBs were not identified in the soil samples.
- The absence in groundwater samples of compounds at concentrations above the New York State Department of Environmental Conservation (NYSDEC) Class GA Ambient Water Quality Standards/Guidance Values (AWQS/GV).

Phase I ESA (450 Union Street), dated May 29, 2014, prepared by Langan

The Phase I ESA incorporated the findings of the previous AKRF and NYPDC investigations. The property has been utilized for commercial and manufacturing operations since at least 1886, and historically contained a garage (1918 – 1930), foundry (1930 – 2007), and fuel company (1931). The existing building was constructed in approximately 1920. The Phase I ESA identified the following recognized environmental conditions (RECs) associated with the site:

REC 1 – Petroleum-Contaminated Soil

AKRF's 2002 SIR revealed that sub-surface soil on the eastern portion of the Subject Property contained SVOCs at concentrations above the NYSDEC Part 375 Unrestricted Use SCOs and indicative of a potential petroleum spill.

REC 2 – Underground Vault

An approximately 10-foot by 20-foot, steel plate-covered, underground vault is located in the metal working area in the eastern portion of the site building. The interior of the vault was inaccessible during the site reconnaissance. The vault may have been historically used for the storage of hazardous materials.

REC 3 – Historical Site Usage and Abandoned Gasoline Tank

Historical use of the Subject Property included a garage, foundry, and fuel company, which may have resulted in unreported leaks or spills of petroleum, solvents, and other hazardous substances. The foundry was also listed as a Resource Conservation and Recovery Act Large Quantity Generator of hazardous waste in 1984. In addition, an inactive gasoline UST registered under NYSDEC Petroleum Bulk Storage (PBS) No. 2-611519 was located on the eastern exterior portion of the property between at least 1938 and 2007. The location of the tank was confirmed during the 2002 Site Investigation. Potential unreported leaks or spills may be associated with the UST.

REC 4 – Current and Historical Surrounding Property Use

The following current and historical uses of surrounding properties may have adversely impacted soil, groundwater, and soil vapor at the Subject Property:

- Large-scale commercial fuel storage facility (Bayside Fuel Oil Depot Corp.) on the northern adjoining property at 505-517 Union Street (1928 – present).
- Private garage with two gasoline tanks on a northern adjoining property at 487-501 Union Street (1950 – 2007).
- Automotive repair (1950 – 2007) and auto wrecking facility (1969 – 2007) on the southern adjoining property at 315 Bond Street. The wrecking facility was also listed as a Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) No Further Remedial Action Planned (NFRAP) site and Conditionally Exempt Small Quantity Generator of hazardous waste in 1998.
- Scrap metal facility (1965 – 1970) on the western adjoining property at 320 Bond Street.
- Automotive repair (1969 – 2007) at 326 Bond Street approximately 50 feet southwest of the Subject Property.

- Electroplating operation located 390 feet southwest and up-gradient of the Subject Property at 337-361 Carroll street. The facility was listed as a generator of hazardous waste in 1996 and 2006.

REC 5 – Spills on Surrounding Properties

The following spills on nearby sites may have adversely impacted soil, groundwater, and/or soil vapor on the Subject Property:

- Petroleum spill (NYSDEC Spill No. 0902825) resulting in dissolved-phase groundwater and free-phase petroleum product contamination on the northern adjoining Bayside Fuel Oil Depot Corp. property.
- Petroleum-contaminated soil (NYSDEC Spill No. 0706319) near the western approach to the Union Street Bridge, which adjoins the Subject Property to the north.
- Petroleum spill (NYSDEC Spill No. 0102612) resulting in contaminated soil on the western adjoining property at 316 Bond Street.
- Federal CERCLIS National Priorities List (i.e., Superfund) site consisting of the Gowanus Canal, which adjoins the Subject Property to the east.

Copies of the 2002 AKRF SIR and 2014 Phase I ESA are provided in Appendix A.

2.0 FIELD INVESTIGATION

The objective of the Phase II ESI was to evaluate whether sub-surface soil, groundwater and soil vapor at the Subject Property have been impacted by the above RECs. The Phase II ESI included a geophysical survey, the advancement of nine soil borings, installation of temporary monitoring wells in seven of the nine soil borings, installation of three soil vapor points, and the collection and laboratory analysis of 17 grab soil samples, seven groundwater samples and three soil vapor samples. The collected samples and the corresponding analyses are summarized in Table 1.

2.1 Geophysical Survey

The New York City One-Call Center was contacted to identify sub-surface utility services entering the site, prior to commencement of field activities. Nova Geophysical & Environmental, Inc. (Nova) of Douglastown, New York conducted a geophysical survey of accessible areas on May 6, 2014. Nova used ground penetrating radar (GPR) and electromagnetic detection equipment to locate USTs, buried utilities, and anomalies throughout the accessible portions of the Subject Property. A Langan engineer was present during the survey. Nova's Geophysical Engineering Survey Report is provided in Appendix B.

2.2 Soil Investigation

The soil investigation consisted of the advancement of nine soil borings (SB-1 through SB-9). Aquifer Drilling & Testing, Inc. (ADT) of Mineola, New York advanced the borings at the direction of a Langan field engineer using a track-mounted Geoprobe® 6620 DT direct-push sampling unit. The borings were advanced to 15 feet below ground surface (ft bgs), with the exception of SB-8, which encountered refusal at 5.5 ft bgs. Soil samples were collected continuously into five-foot long, Macro-Core® sample barrels lined with dedicated acetate sleeves.

Soil samples were visually classified for soil type, grain size, texture and moisture content. Recovered soil was field screened for visual, olfactory, and instrumental evidence of a chemical or petroleum release. Instrument screening for organic vapors was performed with a photoionization detector (PID) equipped with a 10.6 electron Volt (eV) lamp. The borings were backfilled with soil cuttings following sample screening and collection. Boring locations are shown on Figure 2. Field observations were documented in boring logs, which are included in Appendix C.

Two grab soil samples were collected for laboratory analysis from each boring, one from the 0 to 5 ft bgs depth interval and another from the depth interval immediately above the groundwater interface. However, the deep sample in boring SB-3 was collected from the 7 to 7.5 ft bgs interval based on elevated organic vapor concentrations. Only one sample was collected from boring SB-8, due to the shallow depth of Geoprobe® refusal.

Soil samples were collected into laboratory-supplied containers, including Terra Core® samplers for VOC samples, chilled in laboratory-provided coolers and transported via courier to Alpha Analytical Laboratories in Westborough, Massachusetts (Alpha) under standard chain-of-custody protocol. Alpha is a New York State Department of Health Environmental Laboratory Approval Program certified laboratory (Certification No. 11148). The soil samples were analyzed for the following parameters:

- Target compound list (TCL) VOCs via U.S. Environmental Protection Agency (EPA) Method 8260B;
- TCL SVOCs via EPA Method 8270C;
- Polychlorinated biphenyls (PCBs) via EPA Method 8082A;
- Pesticides via EPA Method 8081B (shallow samples only); and
- Target Analyte List (TAL) metals by EPA Method 6010B/7000 series.

Sample SB02_0.5-1 was also analyzed for lead and copper via the toxicity characteristic leaching procedure (TCLP), due to elevated concentrations of copper and lead that were potentially indicative of characteristic hazardous waste.

2.3 Groundwater Investigation

Temporary groundwater monitoring wells MW-1, MW-3, MW-4 through MW-7 and MW-9 were installed in seven of the nine soil borings under the supervision of a Langan field engineer. The monitoring wells consisted of 10 feet of 0.01-inch slotted, Schedule 40 polyvinyl chloride (PVC) screen and attached PVC risers.

The temporary monitoring wells were sampled on May 8, 12, and 13, 2014 with a peristaltic pump using low-flow purging techniques to minimize drawdown. Groundwater quality parameters (i.e., pH, temperature, specific conductance, turbidity, oxidation-reduction potential [ORP], and dissolved oxygen [DO]) were measured and recorded at five-minute intervals using a multiparameter YSI water quality meter. Measurements were collected until the parameters stabilized to within 10% variability between successive measurements, the turbidity was below

50 nephelometric turbidity units (NTU), and a minimum of three well casing volumes were purged from each well, with the exception of monitoring wells MW-1 and MW-5. Poor groundwater recovery precluded stabilization of groundwater quality parameters prior to sample collection from wells MW-1 and MW-5.

Samples were collected into laboratory supplied glassware, placed in chilled, laboratory-provided coolers, and delivered via courier service to Alpha under standard chain-of-custody protocol. The groundwater samples were analyzed for the following parameters:

- TCL VOCs via EPA Method 8260B;
- TCL SVOCs via EPA Method 8270C;
- PCBs via EPA Method 8082A;
- Pesticides via EPA Method 8081B; and
- TAL metals (total and dissolved) by EPA Method 6010B/7000 series.

Samples collected for dissolved metals were filtered in the field using a 1 micron (µM) field filter. Sampling logs containing recovery information are provided in Appendix D. Monitoring well locations are shown on Figure 2.

2.4 Soil Vapor Investigation

Three soil vapor probes were installed to a depth of approximately 7 ft bgs using a Geoprobe® 6620 DT direct-push sampler with 2-inch diameter steel rods. The locations of these probes are shown on Figure 2. The probes were installed in accordance with the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York and consisted of a stainless steel screen threaded into Teflon-lined polyethylene tubing. A sand filter pack was installed around the screen implant by pouring No. 2 sand into the annulus to approximately 2 inches above the probe. The remainder of the annulus was filled to surface grade with a hydrated bentonite seal.

Prior to sampling, a tracer gas test was performed using helium. The helium-tracer test is a quality assurance/quality control (QA/QC) measure to confirm the integrity of the implant seal by evaluating whether surface air has infiltrated the sample. The results of the helium-tracer gas test confirmed the integrity of the sample seal.

Following the helium-tracer gas test, a MultiRAE Plus multiple gas monitor was attached to the polyethylene tubing, and a total volume of at least three tubing and screen air volumes were

purged. The purged soil vapor was also monitored for total organic vapors and the value was recorded in a soil vapor sampling log. After purging was complete, soil vapor samples were collected into laboratory-cleaned and batch-certified six-liter, stainless steel Summa® canisters with regulators calibrated for a sampling rate of 0.05 L/min for a two-hour sampling interval. The Summa® canister arrived from the laboratory with approximately 29 to 30 inches of mercury vacuum. A laboratory-provided courier transported the samples to Alpha under standard chain-of-custody protcol for analysis of VOCs via EPA Method TO-15. The soil vapor sampling locations are shown on Figure 2. Sub-surface soil vapor-point construction and sampling logs are provided in Appendix E.

3.0 OBSERVATIONS AND RESULTS

This section summarizes the field observations and laboratory analytical results for the samples collected during the Phase II ESI.

3.1 Geophysical Survey

Nova's geophysical survey revealed that the site is transected by buried utility lines at depths of 1 to 4 ft bgs. Sewer lines were identified underneath the events space, on the western portion of the property, and parallel to Union Street underneath the eastern portion of the building. A north-south trending water line was identified in the central portion of the property, and isolated anomalies were observed throughout the central and eastern exterior areas. The anomalies were not indicative of USTs, vaults, or other potential environmental concerns. Signal interference precluded profiling of the buried vault in the metal working area, and the presence of stored construction materials prevented access to the area above the inactive UST.

3.2 Sub-surface Observations

3.2.1 Soil Characteristics

Historic fill was observed within each soil boring from surface grade to the maximum termination depth of 15 ft bgs. The fill is primarily comprised of sand with varying amounts of silt, gravel, brick, coal, wood and concrete fragments. The sand was interlayered with clay and silt in all borings, with the exception of SB-1 and SB-8. Organic vapors were detected in soil recovered from borings SB-2 through SB-4, with a maximum detected concentration of 16.4 parts per million (ppm) at 7 ft bgs in boring SB-3. Isolated, mm-scale staining was observed at 4 ft bgs in a silt layer within boring SB-4. Odors or other evidence of soil impacts were not observed during field screening. Bedrock was not encountered in the borings.

3.2.2 Hydrogeology

Groundwater was encountered at depths ranging from 7.24 ft bgs in MW-1 on the western portion of the site to 10.84 ft bgs in MW-5 on the eastern portion of the site. Based on the general topography of the surrounding area, inferred groundwater flow is to the east towards the Gowanus Canal, which adjoins the Subject Property to the east. Groundwater in this area of New York City is not used as a potable (drinking) water source. Potable water in the vicinity of the Subject Property is provided by the City of New York and derived from surface impoundments in the Croton, Catskill, and Delaware watersheds.

3.3 Analytical Results

3.3.1 Soil Sampling

Seventeen soil samples were analyzed for VOCs, SVOCs, PCBs, pesticides and metals. The analytical results were compared to the Part 375 Unrestricted Use and Restricted Residential Use SCOs. The laboratory analytical results are summarized in Table 2 and Figures 3a and 3b. Laboratory analytical reports are included in Appendix F. The laboratory analytical results are summarized as follows:

VOCs

VOCs were not detected at concentrations above the Part 375 Unrestricted Use SCOs.

SVOCs

The concentrations of 14 SVOCs exceeded the Part 375 Unrestricted Use SCOs and 13 SVOCs exceeded the Part 375 Restricted Residential Use SCOs in one or more soil samples. Soil samples collected from borings SB-6 and SB-9 did not contain SVOCs above the Part 375 Unrestricted Use SCOs. SVOCs were detected at both sampled depth intervals and generally belonged to the class of compounds identified as polycyclic aromatic hydrocarbons (PAHs). PAHs are common byproducts of combustion and frequently detected in fill material in New York City.

With the exception of sample SB03_7-7.5, SVOC concentrations ranged from non-detected to 17 mg/kg (SB01-8-8.5). However, the sample collected from the 7 to 7.5 ft bgs depth interval in boring SB-3 contained SVOCs at concentrations above 100 mg/kg and as high as 640 mg/kg (phenanthrene). Naphthalene, which can be associated with petroleum contamination, was detected at a concentration of 210 mg/kg. Boring SB-3 was located immediately east of the inactive UST on the eastern portion of the Subject Property.

Metals

The concentrations of eight metals exceeded the Part 375 Unrestricted Use SCOs and the following five metals exceeded the Part 375 Restricted Residential Use SCOs:

- Arsenic (SB04_8-9; SB06_8-9)
- Copper (SB02_0.5-1; SB03_0-0.5; SB04_1.5-2; SB05-8.5-9; SB06_8-9)
- Lead (SB02_0.5-1; SB06_8-9)
- Mercury (SB01_1-1.5; SB07_0.5-1; SB08_1-2)

- Nickel (SB02_0.5-1)
- Zinc (SB02_0.5-1)

Sample SB02_0.5-1 contained the highest metals concentrations with copper detected at 77,000 mg/kg, which exceeds the Part 375 Industrial Use SCO, and lead detected at 3,800 mg/kg, which exceeds the Part 375 Commercial Use SCO. Cadmium and nickel were also detected in sample SB02_0.5-1 at concentrations above the Part 375 Commercial Use SCOs.

Sample SB02_0.5-1 was subsequently analyzed via TCLP for copper and lead to determine whether soil excavated in the area around boring SB-2 would require management as a hazardous waste. The TCLP concentration of lead was 13 mg/l, which exceeds the Resource Conservation and Recovery Act (RCRA) Maximum Concentration of Contaminants for Toxicity Characteristics of 5 mg/l. In general, the detected values were typical of those observed in historic fill in New York City. However, the anomalous high concentrations detected in boring SB-02 are indicative of metals impacts to shallow soil in that area and potentially associated with historical foundry operations on the Subject Property.

PCBs

PCBs were not detected at concentrations above the Part 375 SCOs.

Pesticides

Four pesticides, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT and dieldrin, were detected at concentrations that exceeded the Part 375 Unrestricted Use SCOs in one or more shallow samples collected from borings SB-2, SB-3 and SB-6. Pesticides were not detected at concentrations above the Part 375 Restricted Residential Use SCOs. Dieldrin represented the maximum detected pesticide concentration of 0.0727 mg/kg in sample SB06_1-1.5. The detected concentrations are indicative of either background conditions in historic fill or localized historical pesticide application.

3.3.2 Groundwater Sampling

Seven groundwater samples were analyzed for VOCs, SVOCs, PCBs, pesticides and metals (total and dissolved). Analytical results were compared to NYSDEC Division of Water Technical and Operation Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards/Guidance Values (AWQS/GV) for Class GA (drinking water) groundwater. The laboratory analytical results are summarized in Table 3 and presented in Figure 4. Laboratory analytical reports are provided in Attachment F. The laboratory analytical results are summarized as follows:

VOCs

Benzene and naphthalene were detected in the groundwater sample collected from monitoring well MW-3 at concentrations of 10 micrograms per liter (µg/l) and 71 µg/l, respectively, which exceed the TOGS AWQS/GV. Benzene and naphthalene are associated with petroleum compounds. Other VOCs were not detected at concentrations above the TOGS AWQS/GV.

SVOCs

Seven SVOCs were detected in one or more groundwater samples at concentrations above the TOGS AWQS/GV. SVOCs were detected at concentrations above the TOGS AWQS/GV in all samples, with the exception of that collected from well MW-6. In general, the detected SVOCs are classified as PAHs and likely attributable to historic fill entrained in the groundwater samples. However, the sample collected from well MW-3 contained 2,4-dimethylphenol, phenol, and naphthalene at concentrations that ranged from 39 µg/l to 970 µg/l and were above the TOGS AWQS/GV. These constituents are commonly associated with petroleum compounds

Metals

Seven metals (aluminum, beryllium, iron, lead, magnesium, manganese and mercury) were detected at concentrations above the TOGS AWQS/GV in one or more of the unfiltered samples. Of these, only iron, magnesium and manganese were detected at concentrations above the TOGS AWQS/GV in the filtered samples, indicating that entrained soil matrix was the source of most of the detections. Due to the absence of elevated concentrations of iron, magnesium and manganese in corresponding soil samples, the detections likely reflect a regional groundwater condition and not a local source.

PCBs and Pesticides

PCBs and pesticides were not detected in the groundwater samples.

3.3.3 Soil Vapor Sample Results

Three sub-surface soil vapor samples were analyzed for VOCs. New York State currently does not have standards, criteria, or guidance values for concentrations of VOCs in sub-surface soil vapor. In lieu of regulatory standards, Air Guideline Values (AGVs) and decision matrices published in the 2006 NYSDOH Soil Vapor Guidance are used as comparison criteria for soil vapor concentrations.

NYSDOH AGVs are established for methylene chloride, tetrachloroethylene (PCE), and trichloroethene (TCE), and the NYSDOH Decision Matrices (Matrices 1 and 2) address the compounds PCE, TCE, 1,1,1-trichloroethane (1,1,1-TCA), and carbon tetrachloride. The matrix evaluation requires soil vapor and indoor air data. Indoor air samples were not collected as part of this investigation; however, the matrices provide a soil vapor concentration above which monitoring and/or mitigation is required, regardless of indoor air concentrations. The laboratory analytical results are summarized in Table 4 and presented in Figure 5. Laboratory analytical reports are provided in Attachment F.

Multiple VOCs were detected in the soil vapor samples, and the concentration of total detected VOCs ranged from 55 µg/m^3 in SV-3 to 1,804 µg/m^3 in SV-1. Of the compounds with AGVs and included in the decision matrices, only PCE and TCE were detected. PCE was detected in samples SV02 and SV03 at concentrations of 11.1 µg/m^3 and 2.56 µg/m^3, respectively, which are below the AGV of 30 µg/m^3. TCE was detected in sample SV02 at a concentration of 4.51 µg/m^3,which is also below the AGV of 5.0 µg/m^3. The range of recommendations provided in the NYSDOH Decision Matrices based on these concentrations are "no further action" and "take reasonable and practical actions to identify source(s) and reduce exposures".

4.0 CONCLUSIONS AND RECOMMENDATIONS

The findings of the Phase II ESI are summarized as follows:

- The geophysical survey did not identify USTs or other suspect buried structures representative of potential environmental concerns. However, the area overlying the inactive gasoline UST on the eastern portion of the property was inaccessible during the investigation. Signal interference precluded profiling of the underground vault in the metal working area.
- The Subject Property is underlain by historic fill extending to a maximum depth of 15 ft bgs, and consisting of interlayered sand, silt, and clay with varying amounts of gravel, brick, coal, wood and concrete fragments.
- A soil vapor concentration of 16.4 ppm was field screened at a depth of 7 ft bgs in boring SB-3 on the eastern portion of the Subject Property. Other indications of a petroleum or chemical release to soil (e.g., staining, odors, or elevator soil vapor concentrations) were not encountered during the field investigation.
- Groundwater was encountered at depths between 7.2 and 10.8 ft bgs. Based on the general topography of the surrounding area, inferred groundwater flow is to the east towards the adjoining Gowanus Canal.
- Multiple SVOCs, metals, and pesticides were detected at concentrations above the Part 375 Unrestricted and Restricted Residential Use SCOs in soil samples. In general, the concentrations were typical of background conditions in historic fill observed throughout New York City and were not indicative of impacts from a local source, with the following exceptions:
    - The sample collected from the 7 - 7.5 ft bgs interval in boring SB-3 near the inactive UST contained napththalene and other SVOCs associated with petroleum compounds at concentrations above 100 mg/kg. The petroleum impacts may be associated with a spill originating from the UST.
    - The shallow soil sample collected from boring SB-2 on the central portion of the property contained copper at a concentration above the Part 375 Industrial Use SCO and lead, cadmium, and nickel at concentrations above the Part 375 Commercial Use SCOs. TCLP analysis indicated that the concentration of lead was above the EPA regulatory level for hazardous waste. The anomalously high

metal concetrations at SB-2 may be associated with historical foundry operations at the Subject Property.

- The groundwater sample collected from monitoring well MW-3, which was located near the inactive UST, contained petroleum-associated VOCs and SVOCs (i.e., benzene, naphthalene, 2,4-dimethylphenol, and phenol) at concentrations above the TOGS AWQS/GV. The petroleum impacts may be associated with a petroleum spill originating from the UST. Indications of environmental impacts were not observed in other collected groundwater samples.
- Multiple VOCs were detected in the soil vapor samples. VOCs were not detected at concentrations above the NYSDOH AGVs, and comparison of the results with the NYSDOH Decision Matrices indicated that soil vapor mitigation is not warranted.

The above findings indicate that historical releases from the inactive gasoline UST on the eastern portion of the Subject Property may have adversely impacted soil and groundwater. Petroleum-related compounds were confined to a single boring and monitoring well, suggesting that impacts are localized. These findings are consistent with those of the 2002 environmental investigation.

Historical metal working operations may have resulted in localized metal impacts to shallow soil, based on the results from a single boring in the central portion of the Subject Property. The laboratory results did not provide evidence of contamination originating from off-site sources or the underground vault in the metal working area. In addition, groundwater sampling results from wells MW-5 and MW-6 did not indicate that contaminants originating from the Subject Property are impacting the Gowanus Canal. The following conclusions were made with respect to the potential future redevelopment of the Subject Property:

- The inactive UST should be administratively closed with NYSDEC and removed in accordance with NYSDEC regulations. Removal of the UST may reveal a petroleum spill, which will require reporting, investigation, and remediation per NYSDEC policy.
- Future discovery of VOC-impacted soil or groundwater associated with the inactive UST may warrant implementation of soil vapor mitigation measures in future building(s) constructed at the Subject Property.
- Excess historic fill generated during construction excavation will be categorized as an NYSDEC Part 360 regulated solid waste. Excavated historic fill and native soil should be handled and disposed in accordance with applicable local, state, and federal regulations.

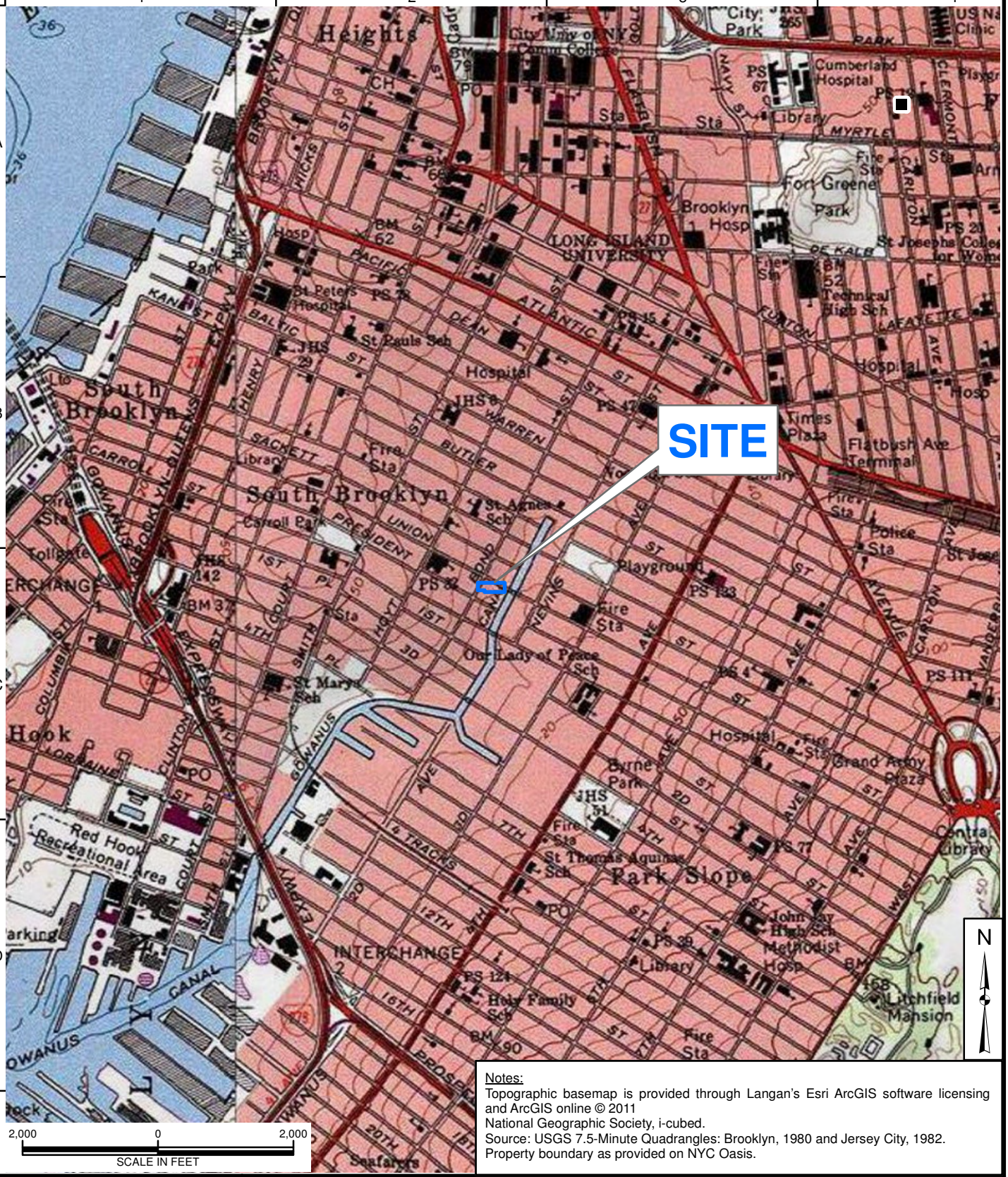
- Should future redevelopment plans require excavation of soil near boring location SB-2, the vertical and lateral extent of hazardous lead soil should be delineated. Additional fees and regulatory reporting are associated with the handling, transport, and disposal of hazardous waste, including an NYSDEC administrative fee of $130/ton and a New York State tax of $27/ton.

5.0 LIMITATIONS

This Phase II ESI was prepared expressly for 450 Union LLC for the property located at 450 Union Street in Brooklyn, New York and for the objectives defined herein. Langan cannot assume responsibility for the use of this Report for any property other than the specific site addressed in this report, or by any third party without specific written authorization from Langan.

The conclusions, opinions, and recommendations provided in this report are based on subsurface conditions ascertained from the analysis of a limited number of samples and from the Phase I Environmental Site Assessment. Recommendations provided are contingent upon one another and no recommendation should be followed independent of the others. Actual conditions encountered may differ substantially from those presented herein and should be brought to our attention whereby we may determine how such changes may affect our conclusions, opinions and recommendations.

FIGURES



Notes:
Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2011
National Geographic Society, i-cubed.
Source: USGS 7.5-Minute Quadrangles: Brooklyn, 1980 and Jersey City, 1982.
Property boundary as provided on NYC Oasis.

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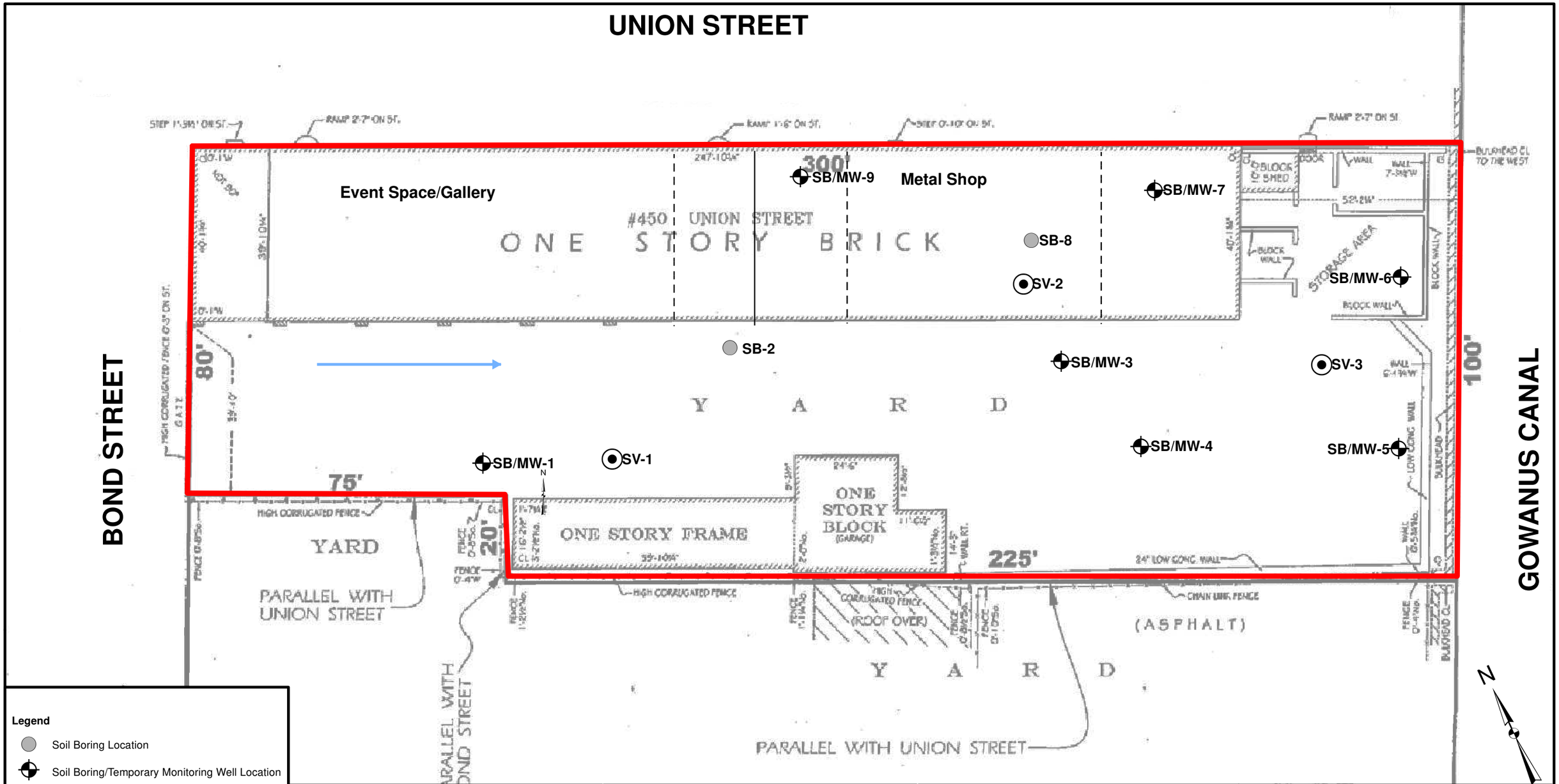
Langan International LLC

Collectively known as Langan

Project
450 Union Street
BLOCK No. 438, LOT No. 7
BROOKLYN NEW YORK

Drawing Title
SITE LOCATION MAP

Project No.	170301201
Date	6/5/2014
Scale	1"=2,000'
Drawn By	MLN
Submission Date	**June 2014**
Figure	1
Sheet	1 of 6



Legend

- Soil Boring Location
- Soil Boring/Temporary Monitoring Well Location
- Soil Vapor Sampling Point
- Property Boundary
- Inferred Groundwater Flow Direction

NOTES:
1. ALL BORING, MOINTORING WELL, AND SOIL VAPOR LOCATIONS ARE APPROXIMATE.
2. SUBJECT PROPERTY BOUNDARY DERIVED FROM NYC DEPARTMENT OF CITY PLANNING, MapPLUTO 13V2.
3. SURVEY PROVIDED BY BORO LAND SURVEYING, P.C., DATED MARCH 25, 2011.

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BLOCK No. 438, LOT No. 7

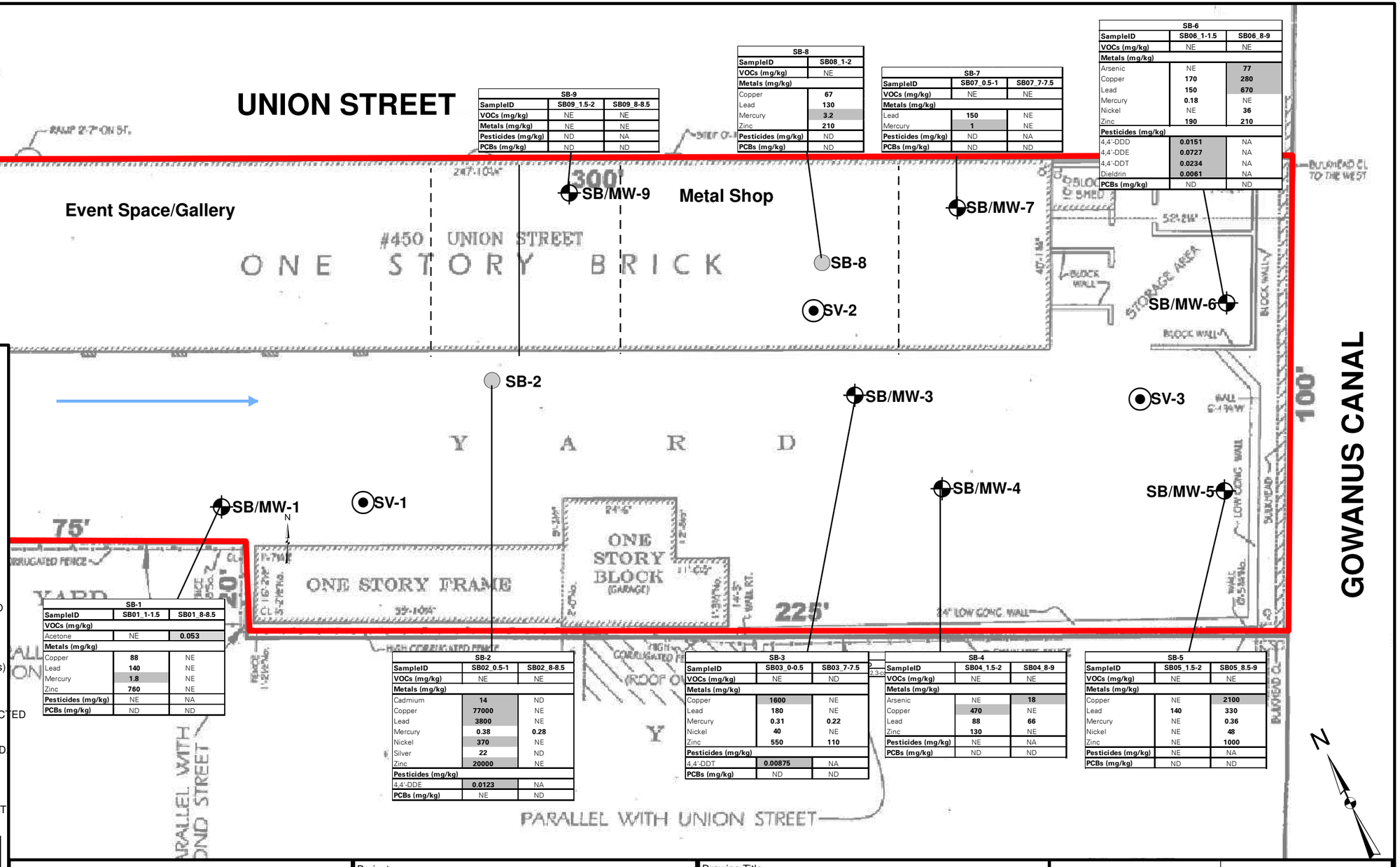
BROOKLYN NEW YORK

Drawing Title

SOIL BORING AND SAMPLE LOCATION MAP

Project No. 170301201	Figure 2
Date 6/5/2014	
Scale Not to Scale	
Drawn By MLN	
Submission Date **June 2014**	Sheet 2 of 6

Path: \\langan.com\data\NY\data2\170301201\ArcGIS\ArcMap_Documents\Figure 2 Boring Location Plan.mxd Date: 6/5/2014 User: MNG Time: 1:46:39 PM



SB-9		
SampleID	SB09_1.5-2	SB09_8-8.5
VOCs (mg/kg)	NE	NE
Metals (mg/kg)	NE	NE
Pesticides (mg/kg)	ND	NA
PCBs (mg/kg)	ND	ND

SB-8	
SampleID	SB08_1-2
VOCs (mg/kg)	NE
Metals (mg/kg)	
Copper	**67**
Lead	**130**
Mercury	**3.2**
Zinc	**210**
Pesticides (mg/kg)	ND
PCBs (mg/kg)	ND

SB-7		
SampleID	SB07_0.5-1	SB07_7-7.5
VOCs (mg/kg)	NE	NE
Metals (mg/kg)		
Lead	**150**	NE
Mercury	**1**	NE
Pesticides (mg/kg)	ND	NA
PCBs (mg/kg)	ND	ND

SB-6		
SampleID	SB06_1-1.5	SB06_8-9
VOCs (mg/kg)	NE	NE
Metals (mg/kg)		
Arsenic	NE	**77**
Copper	**170**	**280**
Lead	**150**	**670**
Mercury	**0.18**	NE
Nickel	NE	**36**
Zinc	**190**	**210**
Pesticides (mg/kg)		
4,4'-DDD	**0.0151**	NA
4,4'-DDE	**0.0727**	NA
4,4'-DDT	**0.0234**	NA
Dieldrin	**0.0061**	NA
PCBs (mg/kg)	ND	ND

SB-1		
SampleID	SB01_1-1.5	SB01_8-8.5
VOCs (mg/kg)		
Acetone	NE	**0.053**
Metals (mg/kg)		
Copper	**88**	NE
Lead	**140**	NE
Mercury	**1.8**	NE
Zinc	**760**	NE
Pesticides (mg/kg)	NE	NA
PCBs (mg/kg)	ND	ND

SB-2		
SampleID	SB02_0.5-1	SB02_8-8.5
VOCs (mg/kg)	NE	NE
Metals (mg/kg)		
Cadmium	**14**	ND
Copper	**77000**	NE
Lead	**3800**	NE
Mercury	**0.38**	**0.28**
Nickel	**370**	NE
Silver	**22**	ND
Zinc	**20000**	NE
Pesticides (mg/kg)		
4,4'-DDE	**0.0123**	NA
PCBs (mg/kg)	NE	ND

SB-3		
SampleID	SB03_0-0.5	SB03_7-7.5
VOCs (mg/kg)	NE	ND
Metals (mg/kg)		
Copper	**1600**	NE
Lead	**180**	NE
Mercury	**0.31**	**0.22**
Nickel	**40**	NE
Zinc	**550**	**110**
Pesticides (mg/kg)		
4,4'-DDT	**0.00875**	NA
PCBs (mg/kg)	ND	ND

SB-4		
SampleID	SB04_1.5-2	SB04_8-9
VOCs (mg/kg)	NE	NE
Metals (mg/kg)		
Arsenic	NE	**18**
Copper	**470**	NE
Lead	**88**	**66**
Zinc	**130**	NE
Pesticides (mg/kg)	NE	NA
PCBs (mg/kg)	ND	ND

SB-5		
SampleID	SB05_1.5-2	SB05_8.5-9
VOCs (mg/kg)	NE	NE
Metals (mg/kg)		
Copper	NE	**2100**
Lead	**140**	**330**
Mercury	NE	**0.36**
Nickel	NE	**48**
Zinc	NE	**1000**
Pesticides (mg/kg)	NE	NA
PCBs (mg/kg)	ND	ND

Legend

- Soil Boring Location
- Soil Boring/Temporary Monitoring Well Location
- Soil Vapor Sampling Point
- Property Boundary
- Inferred Groundwater Flow Direction

NOTES:

1. ALL BORING, MOINTORING WELL, AND SOIL VAPOR LOCATIONS ARE APPROXIMATE.
2. SUBJECT PROPERTY BOUNDARY DERIVED FROM NYC DEPARTMENT OF CITY PLANNING, MapPLUTO 13V2.
3. SURVEY PROVIDED BY BORO LAND SURVEYING, P.C., DATED MARCH 25, 2011.
4. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TITLE 6 OF THE OFFICIAL COMPILATION OF NEW YORK CODES, RULES AND REGULATIONS (NYCRR) PART 375 UNRESTRICTED USE SOIL CLEANUP OBJECTIVES (SCOs) AND RESTRICTED RESIDENTIAL USE SCOs.
5. ONLY COMPOUNDS EXCEEDING THE UNRESTRICTED USE PART 375 ARE INCLUDED ON THIS FIGURE.
6. RESULTS EXCEEDING NYSDEC PART 375 UNRESTRICTED USE SCO ARE IN BOLD.
7. RESULTS EXCEEDING NYSDEC PART 375 RESTRICTED RESIDENTIAL USE SCOs ARE IN BOLD AND HIGHLIGHTED
8. RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
9. VOC = VOLATILE ORGANIC COMPOUNDS,
10. PCBs = POLYCHLORINATED BIPHEYNLS.
11. ND = NOT DETECTED; NE = NO EXCEEDANCES; NA = NOT ANALYZED.

Regulatory Comparison Criteria	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use SCOs - Residential
VOCs (mg/kg)		
Acetone	0.05	100
Metals (mg/kg)		
Arsenic	13	16
Cadmium	2.5	4.3
Copper	50	270
Lead	63	400
Mercury	0.18	0.81
Nickel	30	310
Silver	2	180
Zinc	109	10000
Pesticides (mg/kg)		
4,4'-DDD	0.0033	13
4,4'-DDE	0.0033	8.9
4,4'-DDT	0.0033	7.9
Dieldrin	0.005	0.2

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BROOKLYN NEW YORK

Drawing Title

SOIL SAMPLE ANALYTICAL RESULTS VOCs, METALS, PESTICIDES AND PCBs

Project No. 170301201

Date 6/5/2014

Scale Not to Scale

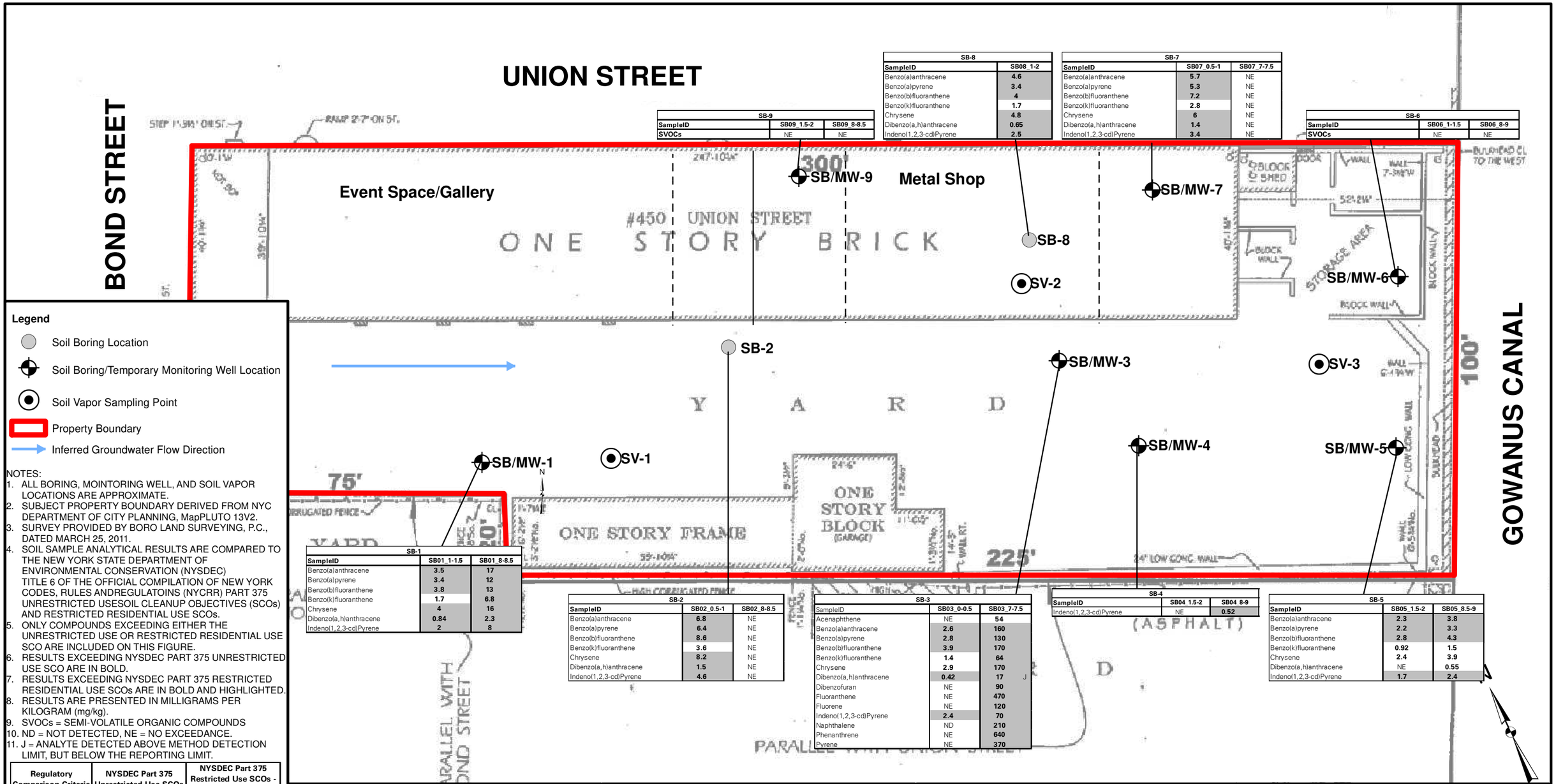
Drawn By MLN

Submission Date **June 2014**

Figure **3A**

Sheet 3 of 6

Path: \\langan.com\data\NY\data2\170301201\ArcGIS\ArcMap_Documents\Figure 3a Soils - VOC, Metals, Pests.mxd Date: 6/5/2014 User: MNG Time: 3:37:27 PM



Legend

- Soil Boring Location
- Soil Boring/Temporary Monitoring Well Location
- Soil Vapor Sampling Point
- Property Boundary
- Inferred Groundwater Flow Direction

NOTES:
1. ALL BORING, MOINTORING WELL, AND SOIL VAPOR LOCATIONS ARE APPROXIMATE.
2. SUBJECT PROPERTY BOUNDARY DERIVED FROM NYC DEPARTMENT OF CITY PLANNING, MapPLUTO 13V2.
3. SURVEY PROVIDED BY BORO LAND SURVEYING, P.C., DATED MARCH 25, 2011.
4. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TITLE 6 OF THE OFFICIAL COMPILATION OF NEW YORK CODES, RULES ANDREGULATOINS (NYCRR) PART 375 UNRESTRICTED USESOIL CLEANUP OBJECTIVES (SCOs) AND RESTRICTED RESIDENTIAL USE SCOs.
5. ONLY COMPOUNDS EXCEEDING EITHER THE UNRESTRICTED USE OR RESTRICTED RESIDENTIAL USE SCO ARE INCLUDED ON THIS FIGURE.
6. RESULTS EXCEEDING NYSDEC PART 375 UNRESTRICTED USE SCO ARE IN BOLD.
7. RESULTS EXCEEDING NYSDEC PART 375 RESTRICTED RESIDENTIAL USE SCOs ARE IN BOLD AND HIGHLIGHTED.
8. RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
9. SVOCs = SEMI-VOLATILE ORGANIC COMPOUNDS
10. ND = NOT DETECTED, NE = NO EXCEEDANCE.
11. J = ANALYTE DETECTED ABOVE METHOD DETECTION LIMIT, BUT BELOW THE REPORTING LIMIT.

Regulatory Comparison Criteria	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use SCOs - Residential
VOCs (mg/kg)		
Acetone	0.05	100
Metals (mg/kg)		
Arsenic	13	16
Cadmium	2.5	4.3
Copper	50	270
Lead	63	400
Mercury	0.18	0.81
Nickel	30	310
Silver	2	180
Zinc	109	10000
Pesticides (mg/kg)		
4,4'-DDD	0.0033	13
4,4'-DDE	0.0033	8.9
4,4'-DDT	0.0033	7.9
Dieldrin	0.005	0.2

SB-1		
SampleID	SB01_1-1.5	SB01_8-8.5
Benzo(a)anthracene	3.5	17
Benzo(a)pyrene	3.4	12
Benzo(b)fluoranthene	3.8	13
Benzo(k)fluoranthene	1.7	6.8
Chrysene	4	16
Dibenzo(a,h)anthracene	0.84	2.3
Indeno(1,2,3-cd)Pyrene	2	8

SB-2		
SampleID	SB02_0.5-1	SB02_8-8.5
Benzo(a)anthracene	6.8	NE
Benzo(a)pyrene	6.4	NE
Benzo(b)fluoranthene	8.6	NE
Benzo(k)fluoranthene	3.6	NE
Chrysene	8.2	NE
Dibenzo(a,h)anthracene	1.5	NE
Indeno(1,2,3-cd)Pyrene	4.6	NE

SB-3			
SampleID	SB03_0-0.5	SB03_7-7.5	
Acenaphthene	NE	54	
Benzo(a)anthracene	2.6	160	
Benzo(a)pyrene	2.8	130	
Benzo(b)fluoranthene	3.9	170	
Benzo(k)fluoranthene	1.4	64	
Chrysene	2.9	170	
Dibenzo(a,h)anthracene	0.42	17	J
Dibenzofuran	NE	90	
Fluoranthene	NE	470	
Fluorene	NE	120	
Indeno(1,2,3-cd)Pyrene	2.4	70	
Naphthalene	ND	210	
Phenanthrene	NE	640	
Pyrene	NE	370	

SB-4		
SampleID	SB04_1.5-2	SB04_8-9
Indeno(1,2,3-cd)Pyrene	NE	0.52

SB-5		
SampleID	SB05_1.5-2	SB05_8.5-9
Benzo(a)anthracene	2.3	3.8
Benzo(a)pyrene	2.2	3.3
Benzo(b)fluoranthene	2.8	4.3
Benzo(k)fluoranthene	0.92	1.5
Chrysene	2.4	3.9
Dibenzo(a,h)anthracene	NE	0.55
Indeno(1,2,3-cd)Pyrene	1.7	2.4

SB-6		
SampleID	SB06_1-1.5	SB06_8-9
SVOCs	NE	NE

SB-7		
SampleID	SB07_0.5-1	SB07_7-7.5
Benzo(a)anthracene	5.7	NE
Benzo(a)pyrene	5.3	NE
Benzo(b)fluoranthene	7.2	NE
Benzo(k)fluoranthene	2.8	NE
Chrysene	6	NE
Dibenzo(a,h)anthracene	1.4	NE
Indeno(1,2,3-cd)Pyrene	3.4	NE

SB-8		
SampleID	SB08_1-2	
Benzo(a)anthracene	4.6	
Benzo(a)pyrene	3.4	
Benzo(b)fluoranthene	4	
Benzo(k)fluoranthene	1.7	
Chrysene	4.8	
Dibenzo(a,h)anthracene	0.65	
Indeno(1,2,3-cd)Pyrene	2.5	

SB-9		
SampleID	SB09_1.5-2	SB09_8-8.5
SVOCs	NE	NE

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BLOCK No. 438, LOT No. 7

BROOKLYN NEW YORK

Drawing Title

SOIL SAMPLE ANALYTICAL RESULTS SVOCs

Project No. 170301201

Date 6/5/2014

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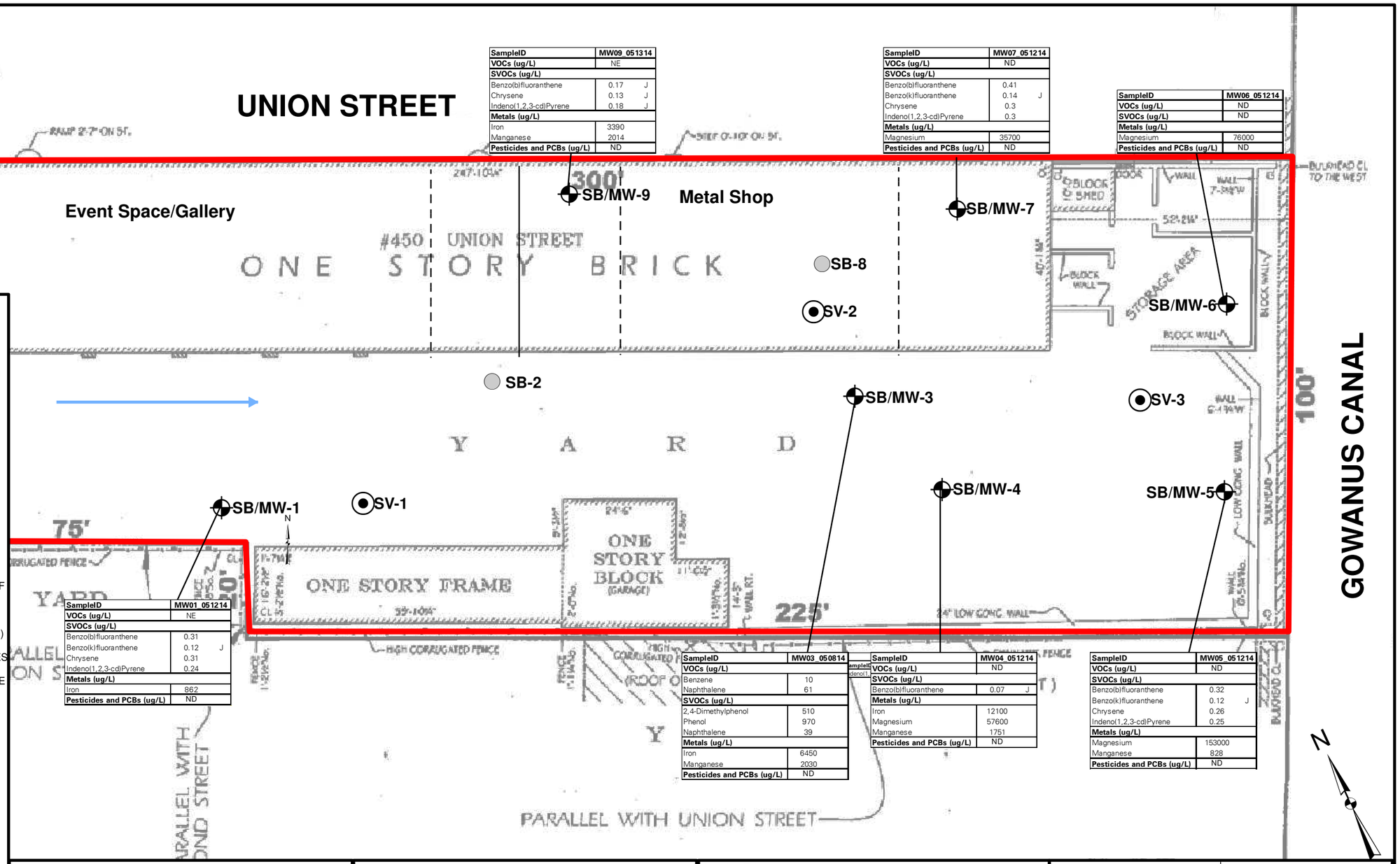
Submission Date **June 2014**

Figure **3B**

Path: \\langan.com\data\NY\data2\170301201\ArcGIS\ArcMap_Documents\Figure 3b Soils - SVOCs.mxd Date: 6/5/2014 User: MNG Time: 1:40:19 PM



SampleID	MW09_051314
VOCs (ug/L)	NE
SVOCs (ug/L)	
Benzo(b)fluoranthene	0.17 J
Chrysene	0.13 J
Indeno(1,2,3-cd)Pyrene	0.18 J
Metals (ug/L)	
Iron	3390
Manganese	2014
Pesticides and PCBs (ug/L)	ND

SampleID	MW07_051214
VOCs (ug/L)	ND
SVOCs (ug/L)	
Benzo(b)fluoranthene	0.41
Benzo(k)fluoranthene	0.14 J
Chrysene	0.3
Indeno(1,2,3-cd)Pyrene	0.3
Metals (ug/L)	
Magnesium	35700
Pesticides and PCBs (ug/L)	ND

SampleID	MW06_051214
VOCs (ug/L)	ND
SVOCs (ug/L)	ND
Metals (ug/L)	
Magnesium	76000
Pesticides and PCBs (ug/L)	ND

SampleID	MW01_051214
VOCs (ug/L)	NE
SVOCs (ug/L)	
Benzo(b)fluoranthene	0.31
Benzo(k)fluoranthene	0.12 J
Chrysene	0.31
Indeno(1,2,3-cd)Pyrene	0.24
Metals (ug/L)	
Iron	862
Pesticides and PCBs (ug/L)	ND

SampleID	MW03_050814
VOCs (ug/L)	
Benzene	10
Naphthalene	61
SVOCs (ug/L)	
2,4-Dimethylphenol	510
Phenol	970
Naphthalene	39
Metals (ug/L)	
Iron	6450
Manganese	2030
Pesticides and PCBs (ug/L)	ND

SampleID	MW04_051214
VOCs (ug/L)	ND
SVOCs (ug/L)	
Benzo(b)fluoranthene	0.07 J
Metals (ug/L)	
Iron	12100
Magnesium	57600
Manganese	1751
Pesticides and PCBs (ug/L)	ND

SampleID	MW05_051214
VOCs (ug/L)	ND
SVOCs (ug/L)	
Benzo(b)fluoranthene	0.32
Benzo(k)fluoranthene	0.12 J
Chrysene	0.26
Indeno(1,2,3-cd)Pyrene	0.25
Metals (ug/L)	
Magnesium	153000
Manganese	828
Pesticides and PCBs (ug/L)	ND

Legend

- Soil Boring Location
- Soil Boring/Temporary Monitoring Well Location
- Soil Vapor Sampling Point
- Property Boundary
- Inferred Groundwater Flow Direction

NOTES:
1. ALL BORING, MOINTORING WELL, AND SOIL VAPOR LOCATIONS ARE APPROXIMATE.
2. SUBJECT PROPERTY BOUNDARY DERIVED FROM NYC DEPARTMENT OF CITY PLANNING, MapPLUTO 13V2.
3. SURVEY PROVIDED BY BORO LAND SURVEYING, P.C., DATED MARCH 25, 2011.
4. GROUNDWATER SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) DIVISION OF WATER TECHNICAL AND OPERATION GUIDANCE (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS (AWQS) FOR CLASS GA (DRINKING WATER) GROUNDWATER.
5. ONLY COMPOUNDS WITH ONE OR MORE EXCEEDANCES ARE INCLUDED ON THIS FIGURE.
6. DISSOLVED (FILTERED) METALS CONCENTRATIONS ARE PRESENTED ON THIS FIGURE.
7. RESULTS ARE PRESENTED IN MICROGRAMS PER LITER (ug/L).
8. VOC = VOLATILE ORGANIC COMPOUNDS
9. SVOC = SEMI-VOLATILE ORGANIC COMPOUNDS
10. PCBs = POLYCHLORINATED BIPHENYLS
11. ND = NOT DETECTED, NE = NO EXCEEDANCE
12. J = ANALYTE DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT, BUT BELOW THE REPORTING LIMIT.

Regulatory Comparison Criteria	NYSDEC TOGS AWQS Class GA
VOCs	
Benzene	1
Naphthalene	10
SVOCs (ug/L)	
2,4-Dimethylphenol	2
Phenol	2
Benzo(b)fluoranthene	0.002
Benzo(ghi)perylene	~
Benzo(k)fluoranthene	0.002
Chrysene	0.002
Indeno(1,2,3-cd)Pyrene	0.002
Naphthalene	10
Metals (ug/L)	
Aluminum	2000
Beryllium	3
Iron	600
Lead	50
Magnesium	35000
Manganese	600
Mercury	1.4

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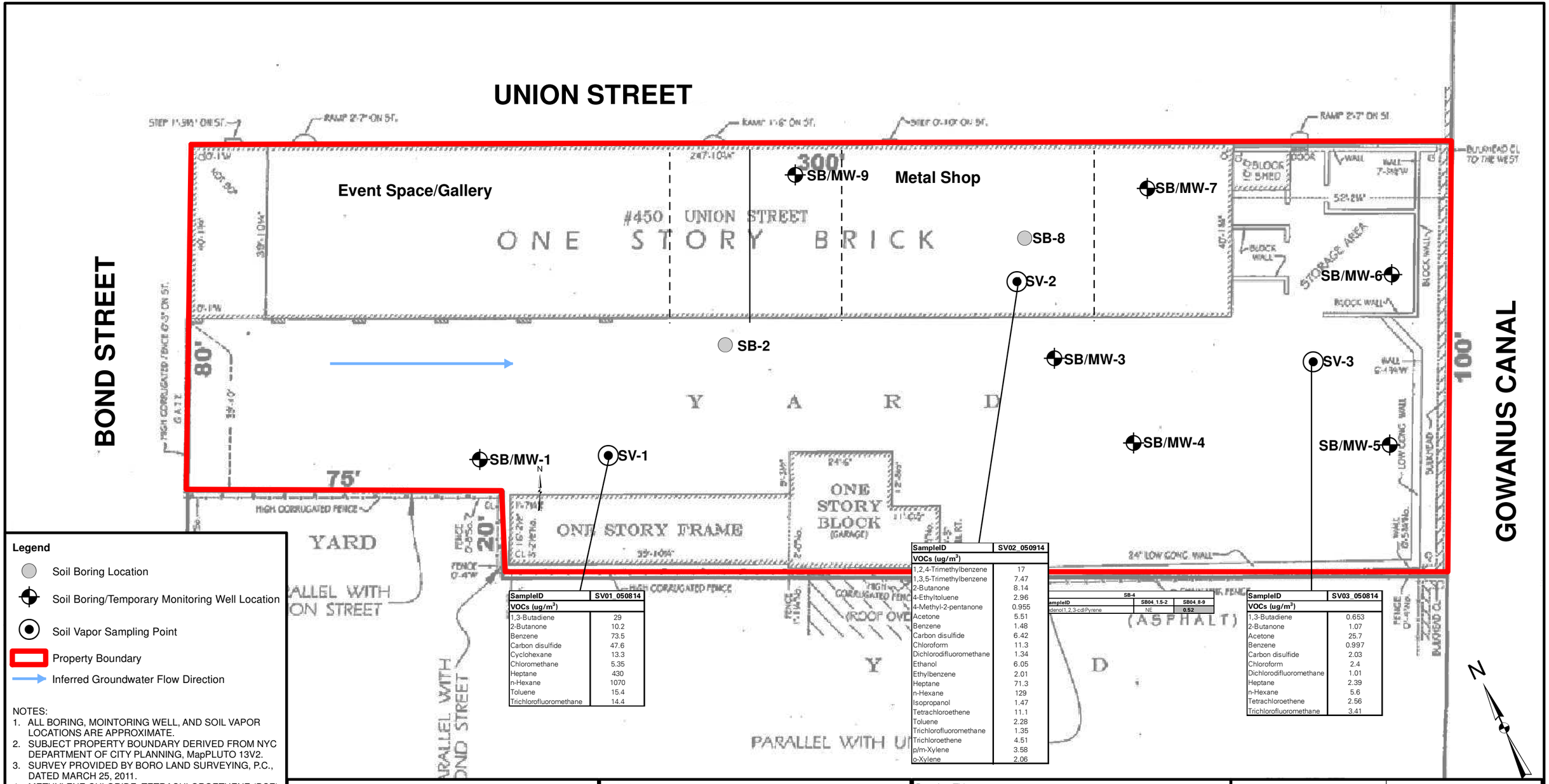
Drawing Title

GROUNDWATER SAMPLE ANALYTICAL RESULTS VOCs, SVOCs, METALS, PESTICIDES, AND PCBs

Project No. 170301201	Figure 4
Date 6/5/2014	
Scale Not to Scale	
Drawn By MLN	
Submission Date **June 2014**	Sheet 5 of 6

Path: \\langan.com\data\NY\data2\170301201\ArcGIS\ArcMap_Documents\Figure 4 GW.mxd Date: 6/5/2014 User: MNG Time: 1:59:41 PM



SampleID	SV01_050814
VOCs (ug/m^3)	
1,3-Butadiene	29
2-Butanone	10.2
Benzene	73.5
Carbon disulfide	47.6
Cyclohexane	13.3
Chloromethane	5.35
Heptane	430
n-Hexane	1070
Toluene	15.4
Trichlorofluoromethane	14.4

SampleID	SV02_050914
VOCs (ug/m^3)	
1,2,4-Trimethylbenzene	17
1,3,5-Trimethylbenzene	7.47
2-Butanone	8.14
4-Ethyltoluene	2.96
4-Methyl-2-pentanone	0.955
Acetone	5.51
Benzene	1.48
Carbon disulfide	6.42
Chloroform	11.3
Dichlorodifluoromethane	1.34
Ethanol	6.05
Ethylbenzene	2.01
Heptane	71.3
n-Hexane	129
Isopropanol	1.47
Tetrachloroethene	11.1
Toluene	2.28
Trichlorofluoromethane	1.35
Trichloroethene	4.51
p/m-Xylene	3.58
o-Xylene	2.06

SB-4		
SampleID	SB04_1.5-2	SB04_8-9
denol1,2,3-cd)Pyrene	NE	0.52

SampleID	SV03_050814
VOCs (ug/m^3)	
1,3-Butadiene	0.653
2-Butanone	1.07
Acetone	25.7
Benzene	0.997
Carbon disulfide	2.03
Chloroform	2.4
Dichlorodifluoromethane	1.01
Heptane	2.39
n-Hexane	5.6
Tetrachloroethene	2.56
Trichlorofluoromethane	3.41

Legend

- Soil Boring Location
- Soil Boring/Temporary Monitoring Well Location
- Soil Vapor Sampling Point
- Property Boundary
- Inferred Groundwater Flow Direction

NOTES:
1. ALL BORING, MOINTORING WELL, AND SOIL VAPOR LOCATIONS ARE APPROXIMATE.
2. SUBJECT PROPERTY BOUNDARY DERIVED FROM NYC DEPARTMENT OF CITY PLANNING, MapPLUTO 13V2.
3. SURVEY PROVIDED BY BORO LAND SURVEYING, P.C., DATED MARCH 25, 2011.
4. METHYLENE CHLORIDE, TETRACHLOROETHENE (PCE), AND TRICHLOROETHENE (TCE) WERE NOT DETECTED IN SOIL VAPOR AT CONCENTRATIONS ABOVE THE NEW YORK STATE DEPARTMENT OF HEALTH AIR GUIDELINE VALUES (AGVs).
5. RESULTS ARE PRESENTED IN MICROGRAMS PER CUBIC METER (ug/m^3).
6. VOC = VOLATILE ORGANIC COMPOUNDS
7. ONLY DETECTED CONSTITUENTS ARE PRESENTED IN THIS FIGURE.

Regulatory Comparison Criteria	NYSDOH AGVs
Tetrachloroethene	30
Trichloroethene	5

LANGAN

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Langan Engineering & Environmental Services, Inc.

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

Langan International LLC

Collectively known as Langan

Project

450 UNION STREET

BLOCK No. 438, LOT No. 7

BROOKLYN NEW YORK

Drawing Title

SOIL VAPOR SAMPLE ANALYTICAL RESULTS

Project No. 170301201

Date 6/5/2014

Scale Not to Scale

Drawn By MLN

Submission Date **June 2014**

Figure 5

Sheet 6 of 6

Path: \\langan.com\data\NY\data2\170301201\ArcGIS\ArcMap_Documents\Figure 5 Soil Vapor.mxd Date: 6/5/2014 User: MNG Time: 3:34:22 PM

TABLES

Table 1
Comprehensive Sample Summary
450 Union Street
Brooklyn, NY
Langan Project No. 170301201

Sample Location	Sample ID	Sample Date	Sample Matrix	Sampling Interval (ft bgs)	Analyses
SB-1	SB01_1-1.5	5/8/2014	Soil	1 to 1.5	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB01_8-8.5	5/8/2014		8 to 8.5	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
SB-2	SB02_0.5-1	5/7/2014		0.5 to 1	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB02_8-8.5	5/7/2014		8 to 8.5	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
SB-3	SB03_0-0.5	5/7/2014		0 to 0.5	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB03_7-7.5	5/7/2014		7 to 7.5	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
SB-4	SB04_1.5-2	5/7/2014		1.5 to 2	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB04_8-9	5/7/2014		8 to 9	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
SB-5	SB05_1.5-2	5/7/2014		1.5 to 2	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB05_8.5-9	5/7/2014		8.5 to 9	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
SB-6	SB06_1-1.5	5/7/2014		1 to 1.5	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB06_8-9	5/7/2014		8 to 9	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
SB-7	SB07_0.5-1	5/8/2014		0.5 to 1	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB07_7-7.5	5/8/2014		7 to 7.5	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
SB-8 (Refusal at 5.5 ft bgs)	SB08_1-2	5/8/2014		1 to 2	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
SB-9	SB09_1.5-2	5/8/2014		1.5 to 2	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals
	SB09_8-8.5	5/8/2014		8 to 8.5	TCL VOCs, TCL SVOCs, PCBs, TAL Metals
MW-1	MW01_051214	5/12/2014	Groundwater	5 to 15	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals (total and dissolved)
MW-3	MW03_050814	5/8/2014		5 to 15	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals (total and dissolved)
MW-4	MW04_051214	5/12/2014		5 to 15	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals (total and dissolved)
MW-5	MW05_051214	5/12/2014		5 to 15	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals (total and dissolved)
MW-6	MW06_051214	5/12/2014		5 to 15	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals (total and dissolved)
MW-7	MW07_051214	5/12/2014		5 to 15	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals (total and dissolved)
MW-9	MW09_051314	5/13/2014		5 to 15	TCL VOCs, TCL SVOCs, Pesticides/PCBs, TAL Metals (total and dissolved)
SV-1	SV01_050814	5/8/2014	Soil Vapor	7	VOCs
SV-2	SV02_050914	8/9/2014		7	VOCs
SV-3	SV03_050814	5/8/2014		7	VOCs

Notes:

TCL = Target Compound List
TAL = Target Analyte List
VOC = Volatile Organic Compounds
SVOC = Semivolatile Organic Compounds
PCB = Polychlorinated Biphenyls
ft bgs = feet below grade surface

Table 2
Soil Sampling Analytical Results
450 Union Street,
Brooklyn, NY
Langan Project No. 170301201

SampleID	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use SCOs - Residential	SB01_1-1.5		SB01_8-8.5		SB02_0.5-1		SB02_8-8.5		SB03_0-0.5	
AlphaID			L1409899-03		L1409899-04		L1409899-09		L1409899-08		L1409764-01	
Sampling Date			5/8/2014		5/8/2014		5/7/2014		5/7/2014		5/7/2014	
VOCs (mg/kg)												
1,2,4,5-Tetramethylbenzene	~	~	0.0059	U	0.0054	U	0.005	U	0.0064	U	0.005	U
Acetone	0.05	100	0.013	J	0.053		0.024		0.041		0.013	
Methylene chloride	0.05	100	0.015	U	0.014	U	0.012	U	0.016	U	0.012	U
Naphthalene	12	100	0.0074	U	0.0068	U	0.0062	U	0.008	U	0.0063	U
Toluene	0.7	100	0.0022	U	0.002	U	0.0018	U	0.0024	U	0.0019	U
SVOCs (mg/kg)												
2-Methylnaphthalene	~	~	0.14	J	0.94	J	0.26	J	0.23	U	0.44	U
3-Methylphenol/4-Methylphenol	~	~	0.27	U	1.9		0.54	U	0.28	U	0.52	U
Acenaphthene	20	100	0.23		3.8		0.79		0.054	J	0.2	J
Acenaphthylene	100	100	0.5		1.1		0.48		0.098	J	0.31	
Anthracene	100	100	0.91		8.9		1.8		0.15		0.71	
Benzo(a)anthracene	1	1	**3.5**		**17**		**6.8**		0.68		**2.6**	
Benzo(a)pyrene	1	1	**3.4**		**12**		**6.4**		0.66		**2.8**	
Benzo(b)fluoranthene	1	1	**3.8**		**13**		**8.6**		0.68		**3.9**	
Benzo(ghi)perylene	100	100	1.7		6		4.2		0.42		2.1	
Benzo(k)fluoranthene	0.8	3.9	**1.7**		**6.8**		**3.6**		0.46		**1.4**	
Bis(2-Ethylhexyl)phthalate	~	~	0.19	U	0.93	U	0.1	J	0.19	U	0.21	J
Carbazole	~	~	0.32		3.5		1		0.12	J	0.35	J
Chrysene	1	3.9	**4**		**16**		**8.2**		0.74		**2.9**	
Dibenzo(a,h)anthracene	0.33	0.33	**0.84**		**2.3**		**1.5**		0.16		**0.42**	
Dibenzofuran	7	-	0.17	J	2.4		0.56		0.19	U	0.12	J
Fluoranthene	100	100	6.7		35		16		1.6		5.8	
Fluorene	30	100	0.19	U	4.5		0.72		0.066	J	0.18	J
Indeno(1,2,3-cd)Pyrene	0.5	0.5	**2**		**8**		**4.6**		0.46		**2.4**	
Naphthalene	12	100	0.22		1.6		0.66		0.15	J	0.36	U
Phenanthrene	100	100	4.2		28		12		0.86		3.3	
Pyrene	100	100	7.5		29		15		1.3		5.1	
Total Detected SVOCs	~	~	43.63		230.44		103.45		11.448		42.74	
PCBs (mg/kg)												
Aroclor 1242	0.1	1	0.0377	U	0.0362	U	0.028	J	0.039	U	0.036	U
Aroclor 1254	0.1	1	0.0377	U	0.0362	U	0.0516		0.039	U	0.036	U
Aroclor 1260	0.1	1	0.0377	U	0.0362	U	0.0322	J	0.039	U	0.0102	J
PCBs, Total	0.1	1	0.0377	U	0.0362	U	**0.112**	**J**	0.039	U	0.0102	J
Pesticides (mg/kg)												
4,4'-DDD	0.0033	13	0.00184	U	NA		0.00177	U	NA		0.00166	U
4,4'-DDE	0.0033	8.9	0.00184	U	NA		**0.0123**		NA		0.00216	
4,4'-DDT	0.0033	7.9	0.00345	U	NA		0.00332	U	NA		**0.00875**	
Chlordane	~	~	0.0149	U	NA		0.0144	U	NA		0.0135	U
cis-Chlordane	0.094	4.2	0.0023	U	NA		0.00221	U	NA		0.00208	U
Dieldrin	0.005	0.2	0.00115	U	NA		0.00111	U	NA		0.00104	U
Heptachlor	0.042	2.1	0.00092	U	NA		0.000885	U	NA		0.00083	U
trans-Chlordane	~	~	0.0023	U	NA		0.00221	U	NA		0.00208	U
Metals (mg/kg)												
Aluminum	~	~	4000		5000		9500		4300		5300	
Antimony	~	~	5		4.4	U	80		4.6	U	2.3	J
Arsenic	13	16	11		3.4		13		6.3		11	
Barium	350	400	67		30		53		42		54	
Beryllium	7.2	72	0.4	J	0.28	J	0.6		0.29	J	0.24	J
Cadmium	2.5	4.3	0.72	J	0.88	U	**14**		0.93	U	0.68	J
Calcium	~	~	2600		3100		6300		2300		31000	
Chromium	~	~	11		9.4		23		8.9		16	
Cobalt	~	~	9.5		4.2		6.7		4.8		4.2	
Copper	50	270	**88**		17		**77000**		41		**1600**	
Iron	~	~	16000		9500		15000		26000		16000	
Lead	63	400	**140**		57		**3800**		42		**180**	
Magnesium	~	~	1100		1900		1400		1200		5800	
Manganese	1600	2000	170		210		210		160		220	
Mercury	0.18	0.81	**1.8**		0.15		**0.38**		**0.28**		**0.31**	
Nickel	30	310	27		16		**370**		19		**40**	
Potassium	~	~	870		680		370		710		740	
Selenium	3.9	180	1.1	J	0.96	J	1.5	J	1.5	J	1.7	U
Silver	2	180	0.9	U	0.88	U	**22**		0.93	U	0.8	J
Sodium	~	~	100	J	93	J	160	J	270		340	
Vanadium	~	~	16		12		14		12		19	
Zinc	109	10000	**760**		34		**20000**		82		**550**	

Notes:
1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYCDEC) title 6 of the official compilation of Nev
York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCO).
2. Only compounds with one or more detections are shown in the table
3. Soil concentrations that exceed NYSDEC Part 375 Unrestricted Use SCO are bold
4. Soil concentrations that exceed NYSDEC Part 375 Restricted Residential Use SCO are bold and highlighted
5. VOCs = Volatile Organic Compounds
6. SVOCs = Semivolatile Organic Compounds
7. PCBs = Polychlorinated Biphenyls
8. mg/kg = milligrams per kilogram
9. NA = Sample not analyzed for constituent.
10. ~ = No regulatory limit has been established for this analyte

Qualifiers:
1. J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimate
2. U = Analyte not detected at or above the level indicatec

Table 2
Soil Sampling Analytical Results
450 Union Street,
Brooklyn, NY
Langan Project No. 170301201

SampleID	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use SCOs - Residential	SB03_7-7.5		SB04_1.5-2		SB04_8-9		SB05_1.5-2	
AlphaID			L1409764-02		L1409764-03		L1409764-04		L1409764-07	
Sampling Date			5/7/2014		5/7/2014		5/7/2014		5/7/2014	
VOCs (mg/kg)										
1,2,4,5-Tetramethylbenzene	~	~	0.025	J	0.0056	U	0.0076	U	0.0042	U
Acetone	0.05	100	1.1	U	0.038		0.028		0.0083	J
Methylene chloride	0.05	100	1.1	U	0.0054	J	0.019	U	0.01	U
Naphthalene	12	100	4.9		0.0071	U	0.0095	U	0.0053	U
Toluene	0.7	100	0.082	J	0.0021	U	0.0029	U	0.0016	U
SVOCs (mg/kg)										
2-Methylnaphthalene	~	~	78		1.3	U	0.42	U	0.16	J
3-Methylphenol/4-Methylphenol	~	~	71	U	1.5	U	0.5	U	0.25	U
Acenaphthene	20	100	**54**		0.84	U	0.28	U	0.93	
Acenaphthylene	100	100	70		0.84	U	0.23	J	0.11	J
Anthracene	100	100	98		0.2	J	0.18	J	1.3	
Benzo(a)anthracene	1	1	**160**		0.66		0.66		**2.3**	
Benzo(a)pyrene	1	1	**130**		0.63	J	0.64		**2.2**	
Benzo(b)fluoranthene	1	1	**170**		0.85		0.86		**2.8**	
Benzo(ghi)perylene	100	100	55		0.5	J	0.52		1.6	
Benzo(k)fluoranthene	0.8	3.9	**64**		0.25	J	0.39		**0.92**	
Bis(2-Ethylhexyl)phthalate	~	~	50	U	1	U	0.34	U	0.18	U
Carbazole	~	~	72		1	U	0.34	U	0.74	
Chrysene	1	3.9	**170**		0.76		0.76		**2.4**	
Dibenzo(a,h)anthracene	0.33	0.33	**17**	J	0.63	U	0.1	J	0.28	
Dibenzofuran	7	-	**90**		1	U	0.34	U	0.46	
Fluoranthene	100	100	**470**		1.2		1.2		6.3	
Fluorene	30	100	**120**		1	U	0.34	U	0.62	
Indeno(1,2,3-cd)Pyrene	0.5	0.5	**70**		0.42	J	**0.52**		**1.7**	
Naphthalene	12	100	**210**		1	U	0.34	U	0.37	
Phenanthrene	100	100	**640**		0.68		0.8		6.8	
Pyrene	100	100	**370**		1.3		1.2		5.4	
Total Detected SVOCs	~	~	3938		8.45		9.42		40.35	
PCBs (mg/kg)										
Aroclor 1242	0.1	1	0.0496	U	0.0336	U	0.0339	U	0.0359	U
Aroclor 1254	0.1	1	0.0496	U	0.0153	J	0.0339	U	0.0359	U
Aroclor 1260	0.1	1	0.0496	U	0.0244	J	0.0339	U	0.0359	U
PCBs, Total	0.1	1	0.0496	U	0.0397	J	0.0339	U	0.0359	U
Pesticides (mg/kg)										
4,4'-DDD	0.0033	13	NA		0.00167		NA		0.000911	J
4,4'-DDE	0.0033	8.9	NA		0.00167	U	NA		0.00172	U
4,4'-DDT	0.0033	7.9	NA		0.00254	J	NA		0.00323	U
Chlordane	~	~	NA		0.0136	U	NA		0.014	U
cis-Chlordane	0.094	4.2	NA		0.00209	U	NA		0.00215	U
Dieldrin	0.005	0.2	NA		0.00104	U	NA		0.00108	U
Heptachlor	0.042	2.1	NA		0.000837	U	NA		0.000861	U
trans-Chlordane	~	~	NA		0.00209	U	NA		0.00252	
Metals (mg/kg)										
Aluminum	~	~	11000		4200		2700		1800	
Antimony	~	~	6	U	4	U	4.1	U	4.2	U
Arsenic	13	16	9.7		6.1		**18**		12	
Barium	350	400	66		40		22		17	
Beryllium	7.2	72	0.43	J	0.11	J	0.5		0.41	J
Cadmium	2.5	4.3	1.2	U	0.12	J	0.83	U	0.84	U
Calcium	~	~	41000		40000		3100		930	
Chromium	~	~	16		12		3.2		4.1	
Cobalt	~	~	13		4.8		4.9		1.8	
Copper	50	270	29		**470**		34		28	
Iron	~	~	23000		13000		13000		9400	
Lead	63	400	37		**88**		**66**		**140**	
Magnesium	~	~	10000		20000		1000		690	
Manganese	1600	2000	560		180		120		100	
Mercury	0.18	0.81	**0.22**		0.12		0.13		0.11	
Nickel	30	310	26		15		6.9		4.1	
Potassium	~	~	1400		690		1100		830	
Selenium	3.9	180	2.4	U	1.6	U	1.6	U	3.2	
Silver	2	180	1.2	U	0.21	J	0.83	U	0.84	U
Sodium	~	~	520		180		570		100	J
Vanadium	~	~	21		31		5.4		6.9	
Zinc	109	10000	**110**		**130**		98		93	

Notes:
1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYCDEC) title 6 of the official compilation of Nev York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCO).
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Table 2
Soil Sampling Analytical Results
450 Union Street,
Brooklyn, NY
Langan Project No. 170301201

SampleID	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use SCOs - Residential	SB05_8.5-9		SB06_1-1.5		SB06_8-9		SB07_0.5-1	
AlphaID			L1409764-08		L1409764-05		L1409764-06		L1409899-01	
Sampling Date			5/7/2014		5/7/2014		5/7/2014		5/8/2014	
VOCs (mg/kg)										
1,2,4,5-Tetramethylbenzene	~	~	0.0044	U	0.0054	U	0.0057	U	0.0048	U
Acetone	0.05	100	0.0055	J	0.0085	J	0.027		0.045	
Methylene chloride	0.05	100	0.011	U	0.013	U	0.0036	J	0.006	J
Naphthalene	12	100	0.003	J	0.0067	U	0.0071	U	0.006	U
Toluene	0.7	100	0.0017	U	0.002	U	0.0021	U	0.0018	U
SVOCs (mg/kg)										
2-Methylnaphthalene	~	~	0.14	J	0.21	U	0.24	U	0.57	
3-Methylphenol/4-Methylphenol	~	~	0.27	U	0.25	U	0.29	U	0.27	U
Acenaphthene	20	100	0.65		0.14	U	0.16	U	2	
Acenaphthylene	100	100	0.23		0.036	J	0.16	U	0.13	J
Anthracene	100	100	1.4		0.1		0.04	J	2	
Benzo(a)anthracene	1	1	**3.8**		0.29		0.11	J	**5.7**	
Benzo(a)pyrene	1	1	**3.3**		0.27		0.1	J	**5.3**	
Benzo(b)fluoranthene	1	1	**4.3**		0.37		0.14		**7.2**	
Benzo(ghi)perylene	100	100	2.1		0.18		0.077	J	3.1	
Benzo(k)fluoranthene	0.8	3.9	**1.5**		0.13		0.05	J	**2.8**	
Bis(2-Ethylhexyl)phthalate	~	~	0.1	J	0.18	U	0.2	U	0.19	U
Carbazole	~	~	0.48		0.039	J	0.2	U	1.2	
Chrysene	1	3.9	**3.9**		0.29		0.12		**6**	
Dibenzo(a,h)anthracene	0.33	0.33	**0.55**		0.045	J	0.12	U	**1.4**	
Dibenzofuran	7	-	0.23		0.18	U	0.2	U	1.5	
Fluoranthene	100	100	9.5		0.62		0.26		21	
Fluorene	30	100	0.54		0.18	U	0.2	U	1.4	
Indeno(1,2,3-cd)Pyrene	0.5	0.5	**2.4**		0.21		0.09	J	**3.4**	
Naphthalene	12	100	0.19		0.18	U	0.2	U	1.2	
Phenanthrene	100	100	6.5		0.43		0.23		19	
Pyrene	100	100	7.1		0.51		0.23		17	
Total Detected SVOCs	~	~	53.93		4.24		1.647		105.05	
PCBs (mg/kg)										
Aroclor 1242	0.1	1	0.0372	U	0.0326	U	0.0377	U	0.0378	U
Aroclor 1254	0.1	1	0.0229	J	0.0326	U	0.0377	U	0.0378	U
Aroclor 1260	0.1	1	0.0337	J	0.0169	J	0.0377	U	0.0378	U
PCBs, Total	0.1	1	0.0566	J	0.0169	J	0.0377	U	0.0378	U
Pesticides (mg/kg)										
4,4'-DDD	0.0033	13	NA		**0.0151**		NA		0.00177	U
4,4'-DDE	0.0033	8.9	NA		**0.0727**		NA		0.00177	U
4,4'-DDT	0.0033	7.9	NA		**0.0234**		NA		0.00331	U
Chlordane	~	~	NA		0.122		NA		0.0144	U
cis-Chlordane	0.094	4.2	NA		0.0336		NA		0.00221	U
Dieldrin	0.005	0.2	NA		**0.0061**		NA		0.0011	U
Heptachlor	0.042	2.1	NA		0.00186		NA		0.000883	U
trans-Chlordane	~	~	NA		0.0226		NA		0.00221	U
Metals (mg/kg)										
Aluminum	~	~	8000		7100		4500		5600	
Antimony	~	~	3.9	J	1.7	J	4.8	U	1.1	J
Arsenic	13	16	12		8.1		**77**		7.7	
Barium	350	400	58		42		33		73	
Beryllium	7.2	72	0.35	J	0.3	J	1.8		0.3	J
Cadmium	2.5	4.3	1.2		0.19	J	0.4	J	0.9	U
Calcium	~	~	9100		6900		4500		6700	
Chromium	~	~	41		25		45		12	
Cobalt	~	~	6.6		4.1		17		5.8	
Copper	50	270	**2100**		**170**		**280**		41	
Iron	~	~	18000		11000		130000		14000	
Lead	63	400	**330**		**150**		**670**		**150**	
Magnesium	~	~	3100		2300		800		**2200**	
Manganese	1600	2000	210		200		520		**230**	
Mercury	0.18	0.81	**0.36**		**0.18**		0.06	J	**1**	
Nickel	30	310	**48**		13		**36**		17	
Potassium	~	~	690		570		950		970	
Selenium	3.9	180	0.48	J	1.7	U	2.1		0.71	J
Silver	2	180	0.66	J	0.18	J	0.97	U	0.9	U
Sodium	~	~	110	J	86	J	470		150	J
Vanadium	~	~	20		18		48		18	
Zinc	109	10000	**1000**		**190**		**210**		85	

Notes:
1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYCDEC) title 6 of the official compilation of Nev York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCO).
2. Only compounds with one or more detections are shown in the table
3. Soil concentrations that exceed NYSDEC Part 375 Unrestricted Use SCO are bold
4. Soil concentrations that exceed NYSDEC Part 375 Restricted Residential Use SCO are bold and highlighted
5. VOCs = Volatile Organic Compounds
6. SVOCs = Semivolatile Organic Compounds
7. PCBs = Polychlorinated Biphenyls
8. mg/kg = milligrams per kilogram
9. NA = Sample not analyzed for constituent.
10. ~ = No regulatory limit has been established for this analyte

Qualifiers:
1. J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimate
2. U = Analyte not detected at or above the level indicatec

Table 2
Soil Sampling Analytical Results
450 Union Street,
Brooklyn, NY
Langan Project No. 170301201

SampleID	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use SCOs - Residential	SB07_7-7.5		SB08_1-2		SB09_1.5-2		SB09_8-8.5	
AlphaID			L1409899-02		L1409958-01		L1409899-06		L1409899-07	
Sampling Date			5/8/2014		5/8/2014		5/8/2014		5/8/2014	
VOCs (mg/kg)										
1,2,4,5-Tetramethylbenzene	~	~	0.0047	U	0.0061	U	0.0041	U	0.0041	U
Acetone	0.05	100	0.017		0.024		0.016		0.022	
Methylene chloride	0.05	100	0.0032	J	0.015	U	0.0049	J	0.0061	J
Naphthalene	12	100	0.0059	U	0.0076	U	0.0052	U	0.0051	U
Toluene	0.7	100	0.0018	U	0.0023	U	0.0016	U	0.0015	U
SVOCs (mg/kg)										
2-Methylnaphthalene	~	~	0.21	U	0.11	J	0.2	U	0.2	U
3-Methylphenol/4-Methylphenol	~	~	0.25	U	0.26	U	0.25	U	0.24	U
Acenaphthene	20	100	0.14	U	0.44		0.14	U	0.14	U
Acenaphthylene	100	100	0.14	U	0.29		0.14	U	0.14	U
Anthracene	100	100	0.071	J	1.1		0.1	U	0.1	U
Benzo(a)anthracene	1	1	0.13		**4.6**		0.1	U	0.071	J
Benzo(a)pyrene	1	1	0.16		**3.4**		0.14	U	0.074	J
Benzo(b)fluoranthene	1	1	0.19		**4**		0.1	U	0.063	J
Benzo(ghi)perylene	100	100	0.12	J	2.2		0.14	U	0.054	J
Benzo(k)fluoranthene	0.8	3.9	0.058	J	**1.7**		0.1	U	0.057	J
Bis(2-Ethylhexyl)phthalate	~	~	0.17	U	0.18	U	0.17	U	0.17	U
Carbazole	~	~	0.17	U	0.46		0.17	U	0.17	U
Chrysene	1	3.9	0.12		**4.8**		0.1	U	0.08	J
Dibenzo(a,h)anthracene	0.33	0.33	0.09	J	**0.65**		0.1	U	0.1	U
Dibenzofuran	7	-	0.17	U	0.26		0.17	U	0.17	U
Fluoranthene	100	100	0.36		9		0.1	U	0.12	
Fluorene	30	100	0.17	U	0.39		0.17	U	0.17	U
Indeno(1,2,3-cd)Pyrene	0.5	0.5	0.18		**2.5**		0.14	U	0.049	J
Naphthalene	12	100	0.17	U	0.31		0.17	U	0.17	U
Phenanthrene	100	100	0.26		6.3		0.1	U	0.057	J
Pyrene	100	100	0.28		9.6		0.1	U	0.11	
Total Detected SVOCs	~	~	2.529		55.09		0		0.735	
PCBs (mg/kg)										
Aroclor 1242	0.1	1	0.0349	U	0.0354	U	0.0331	U	0.0325	U
Aroclor 1254	0.1	1	0.0349	U	0.0354	U	0.0331	U	0.0325	U
Aroclor 1260	0.1	1	0.0349	U	0.0354	U	0.0331	U	0.0325	U
PCBs, Total	0.1	1	0.0349	U	0.0354	U	0.0331	U	0.0325	U
Pesticides (mg/kg)										
4,4'-DDD	0.0033	13	NA		0.00166	U	0.00166	U	NA	
4,4'-DDE	0.0033	8.9	NA		0.00166	U	0.00166	U	NA	
4,4'-DDT	0.0033	7.9	NA		0.00312	U	0.00311	U	NA	
Chlordane	~	~	NA		0.0135	U	0.0135	U	NA	
cis-Chlordane	0.094	4.2	NA		0.00208	U	0.00208	U	NA	
Dieldrin	0.005	0.2	NA		0.00104	U	0.00104	U	NA	
Heptachlor	0.042	2.1	NA		0.000832	U	0.00083	U	NA	
trans-Chlordane	~	~	NA		0.00208	U	0.00208	U	NA	
Metals (mg/kg)										
Aluminum	~	~	2300		3900		2300		2000	
Antimony	~	~	1	J	4.2	U	4.1	U	4	U
Arsenic	13	16	5		4.5		3.1		3.6	
Barium	350	400	15		48		17		14	
Beryllium	7.2	72	0.9		0.3	J	0.52		0.36	J
Cadmium	2.5	4.3	0.1	J	0.76	J	0.82	U	0.81	U
Calcium	~	~	2200		2400		2200		960	
Chromium	~	~	3.7		9.4		2		1.7	
Cobalt	~	~	1.2	J	4.2		1.2	J	1	J
Copper	50	270	6.8		**67**		3.5		3.4	
Iron	~	~	7200		11000		6300		5200	
Lead	63	400	20		**130**		19		11	
Magnesium	~	~	1100		1600		1200		910	
Manganese	1600	2000	140		210		130		110	
Mercury	0.18	0.81	0.05	J	**3.2**		0.03	J	0.02	J
Nickel	30	310	1.4	J	14		1.1	J	0.77	J
Potassium	~	~	1500		740		1500		1300	
Selenium	3.9	180	1.7	U	0.38	J	1.6	U	1.6	U
Silver	2	180	0.84	U	0.84	U	0.82	U	0.81	U
Sodium	~	~	140	J	140	J	98	J	68	J
Vanadium	~	~	6.1		16		6		4.7	
Zinc	109	10000	48		**210**		27		26	

Notes:
1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYCDEC) title 6 of the official compilation of Nev York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCO).
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5. VOCs = Volatile Organic Compounds
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7. PCBs = Polychlorinated Biphenyls
8. mg/kg = milligrams per kilogram
9. NA = Sample not analyzed for constituent.
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Qualifiers:
1. J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimate
2. U = Analyte not detected at or above the level indicatec

Table 3
Groundwater Sampling Analytical Results
450 Union Street
Brooklyn, New York
Langan Project No. 170301201

SampleID	NYSDEC TOGS AWQA CLASS GA	MW01_051214		MW03_050814		MW04_051214		MW05_051214		MW06_051214		MW07_051214		MW09_051314	
AlphaID		L1410118-03		L1409899-05		L1410118-02		L1410118-04		L1410118-01		L1410149-03		L1410149-01	
Sampling Date		5/12/2014		5/8/2014		5/12/2014		5/12/2014		5/12/2014		5/12/2014		5/13/2014	
Dilution Factor		1		1		1		1		1		1		1	
VOCs (ug/L)															
Acetone	50	6.9		5	U	5	U	5	U	5	U	4.1	J	2.5	J
Benzene	1	0.5	U	**10**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyl tert butyl ether	10	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	0.99	J
Naphthalene	10	4.6		**61**		2.5	U	2.5	U	2.5	U	2.5	U	1.1	J
o-Xylene	5	2.5	U	1.1	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p/m-Xylene	5	2.5	U	1.7	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Toluene	5	2.5	U	3.8		2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Xylenes, Total	~	2.5	U	2.8	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
SVOCs (ug/L)															
2,4-Dimethylphenol	2	5	U	**510**		5	U	5	U	5	U	5	U	5	U
2-Methylphenol	~	5	U	540		5	U	5	U	5	U	5	U	5	U
3-Methylphenol/4-Methylphenol		5	U	1800		5	U	5	U	5	U	5	U	5	U
Bis(2-Ethylhexyl)phthalate	5	4.4	B	60	U	3	U	3.7	B	3	U	1.6	JB	3	U
Phenol	2	5	U	**970**		5	U	5	U	5	U	5	U	5	U
2-Chloronaphthalene	10	0.2	U	1	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-Methylnaphthalene	~	0.69		5.6		0.12	J	0.2	U	0.2	U	0.2	U	0.44	
Acenaphthene	20	1.7		3.3		0.22		0.13	J	0.2	U	0.22		0.97	
Acenaphthylene	~	0.3		2.2		0.2	U	0.2	U	0.2	U	0.08	J	0.11	J
Anthracene	50	0.42		1.4		0.11	J	0.1	J	0.2	U	0.13	J	0.33	
Benzo(a)anthracene	0.002	0.3		1	U	0.06	J	0.25		0.2	U	0.3		0.15	J
Benzo(a)pyrene	~	0.29		1	U	0.2	U	0.26		0.2	U	0.3		0.18	J
Benzo(b)fluoranthene	0.002	**0.31**		1	U	**0.07**	J	**0.32**		0.2	U	**0.41**		**0.17**	**J**
Benzo(ghi)perylene	~	0.13	J	1	U	0.2	U	0.15	J	0.2	U	0.19	J	0.07	J
Benzo(k)fluoranthene	0.002	**0.12**	**J**	1	U	0.2	U	**0.12**	J	0.2	U	**0.14**	**J**	0.2	U
Chrysene	0.002	**0.31**		1	U	0.2	U	**0.26**		0.2	U	**0.3**		**0.13**	**J**
Fluoranthene	50	1.3		1.6		0.2		0.64		0.2	U	0.73		0.68	
Fluorene	50	1		3.7		0.17	J	0.06	J	0.2	U	0.12	J	0.66	
Indeno(1,2,3-cd)Pyrene	0.002	**0.24**		1	U	0.2	U	**0.25**		0.2	U	**0.3**		**0.18**	**J**
Naphthalene	10	2.6		**39**		0.44		0.11	J	0.2	U	0.16	J	1.1	
Phenanthrene	50	2.5		7.9		0.48		0.32		0.2	U	0.52		1.8	
Pyrene	50	1.1		1		0.18	J	0.59		0.2	U	0.75		0.59	
Pesticides/PCBs (ug/L)															
		ND		ND		ND		ND		ND		ND		ND	

Table 3
Groundwater Sampling Analytical Results
450 Union Street
Brooklyn, New York
Langan Project No. 170301201

SampleID	NYSDEC TOGS AWQS CLASS GA	MW01_051214		MW03_050814		MW04_051214		MW05_051214		MW06_051214		MW07_051214		MW09_051314	
AlphaID		L1410118-03		L1409899-05		L1410118-02		L1410118-04		L1410118-01		L1410149-03		L1410149-01	
Sampling Date		5/12/2014		5/8/2014		5/12/2014		5/12/2014		5/12/2014		5/12/2014		5/13/2014	
Dilution Factor		1		1		1		1		1		1		1	
Turbidity		**15.1**		**416.4**		**339.2**		**5.4**		**554**		**1**		**22.7**	
TAL Metals, Dissolved (ug/L)															
Aluminum	2000	8.34	J	3.72	J	4.59	J	5.89	J	4.55	J	16.8		34.4	
Antimony	6	1.3		4.37		1.26	J	2.39		2.99		2		1.003	
Arsenic	50	6.22		7.29		2.64		3.23		2.31		8.61		18.25	
Barium	2000	49.7		274.8		183.2		103.9		31.61		41.58		213.9	
Beryllium	3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Cadmium	10	0.2	U	0.2	U	0.2	U	0.2	U	0.11	J	0.07	J	0.2	U
Calcium	~	65300		228000		178000		176000		201000		83700		140000	
Chromium	100	0.55	J	0.49	J	0.54	J	0.72	J	0.89	J	4.01		0.53	J
Cobalt	~	0.34		0.46		0.97		0.59		0.22		0.3		3.02	
Copper	1000	1.2	J	0.35	J	0.33	J	0.2	J	3.96		1.22	J	0.71	J
Iron	600	**862**		**6450**		**12100**		532		39.6	J	61.1		**3390**	
Lead	50	1	U	1	U	1	U	1	U	0.3	J	0.41	J	1	U
Magnesium	35000	18400		21300		**57600**		**153000**		**76000**		**35700**		30800	
Manganese	600	506.2		**2030**		**1751**		**828**		3.4		155		**2014**	
Mercury	1.4	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Nickel	200	4.89		3.94		7.43		4		6.23		3.51		3.04	
Potassium	~	13400		32100		39000		60700		34400		28500		29000	
Selenium	20	5	U	5	U	0.32	J	1.35	J	8.73		6.03		0.56	J
Silver	100	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Sodium	~	94400		432000		693000		941000		716000		333000		441000	
Thallium	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.04	J	0.5	U	0.5	U
Vanadium	~	0.97	J	0.61	J	0.49	J	4.3	J	1.03	J	2.36	J	0.8	J
Zinc	5000	6	J	6.51	J	17.15		11.7		42.06		6.91	J	4.43	J
TAL Metals, Total (ug/L)															
Aluminum	2000	1500		**27700**		66.5		1380		98		843		170	
Antimony	6	1.04	J	1.04	J	1.04	J	2.84	J	2.05	J	1.6	J	0.61	J
Arsenic	50	7.36		39.35		2.59		4.95		1.96		9.52		19.5	
Barium	2000	64.74		877		178.9		122.8		27.23		51.86		216.8	
Beryllium	3	0.15	J	**3.21**		0.5	U	0.17	J	0.5	U	1	U	1	U
Cadmium	10	0.2	U	1.86		0.05	J	0.22		0.16	J	0.4	U	0.4	U
Calcium		70600		441000		228000		214000		171000		88800		146000	
Chromium	100	3.42		55.9		0.67	J	3.07		1.32		7.75		0.96	J
Cobalt		1.94		21.93		0.99		1.45		0.35		1		2.83	
Copper	1000	5.58		258.5		5.74		141.8		5.57		9.4		10.29	
Iron	600	**3920**		**55800**		**11300**		**2340**		299		**1260**		**3520**	
Lead	50	10.15		**1448**		8.42		**113.8**		5.64		20.34		5.28	
Magnesium	35000	19100		**86400**		**74000**		**151000**		**61900**		34000		**50200**	
Manganese	600	**616**		**6754**		**2064**		**921.6**		6.91		169.6		**1948**	
Mercury	1.4	0.2	U	**5.6**		0.2	U	0.31		0.2	U	0.15	J	0.2	U
Nickel	200	11.82		85.35		6.77		8.52		5.92		6.87		4.6	
Potassium		13000		36500		36400		58900		30500		27000		26900	
Selenium	20	0.32	J	7.03	J	0.33	J	1.58	J	8.32		7.72	J	2.7	J
Silver	100	0.4	U	0.71	J	0.4	U	0.4	U	0.4	U	0.8	U	0.8	U
Sodium		88800		446000		791000		1090000		585000		316000		424000	
Thallium	0.5	0.5	U	0.44	J	0.5	U	0.03	J	0.5	U	1	U	1	U
Vanadium		5.54		82.15		0.63	J	9.27		0.8	J	4.28	J	1.47	J
Zinc	5000	21.21		710		24.58		144.7		43.45		27.42		17.52	J

Table 3
Groundwater Sampling Analytical Results
450 Union Street
Brooklyn, New York
Langan Project No. 170301201

Notes:

1. Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYCDEC) Technical & Operational Guidance Series (TOGS) Ambient Water Quality Standards (AWQS) for Class GA.
2. Only compounds with one or more detections are shown in the table.
3. Concentrations exceeding AWQS are in bold and highlighted.
4. VOCs = Volatile Organic Compounds
5. SVOCs = Semivolatile Organic Compounds
6. PCBs = Polychlorinated Biphenyls
7. ug/L = micrograms per liter
8. ~ = No regulatory limit has been established for this analyte.
9. ND = not detected

Qualifiers:

1. J = Analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated.
2. U = Analyte not detected at or above the level indicated.
3. B = Method blank concentration above the reporting limit.

Table 4
Soil Vapor Analytical Results
450 Union Street
Brooklyn, New York
Langan Project No. 170301201

SampleID AlphaID Sampling Date	NYSDOH AGVs	SV01_050814 L1410060-01 5/8/2014	SV02_050914 L1410060-03 5/9/2014	SV03_050814 L1410060-02 5/8/2014
Volatile Organic Compounds (µg/m³)				
1,2,4-Trimethylbenzene	~	9.83 U	17	0.983 U
1,3-Butadiene	~	29	0.442 U	0.653
1,3,5-Trimethylbenzene	~	9.83 U	7.47	0.983 U
2-Butanone	~	10.2	8.14	1.07
4-Ethyltoluene	~	9.83 U	2.96	0.983 U
4-Methyl-2-pentanone	~	8.2 U	0.955	0.82 U
Acetone	~	23.8 U	5.51	25.7
Benzene	~	73.5	1.48	0.997
Carbon disulfide	~	47.6	6.42	2.03
Chloroform	~	9.77 U	11.3	2.4
Cyclohexane	~	13.3	0.688 U	0.688 U
Chloromethane	~	5.35	0.413 U	0.413 U
Dichlorodifluoromethane	~	9.89 U	1.34	1.01
Ethanol	~	47.1 U	6.05	4.71 U
Ethylbenzene	~	8.69 U	2.01	0.869 U
Heptane	~	430	71.3	2.39
n-Hexane	~	1070	129	5.6
Isopropanol	~	12.3 U	1.47	1.23 U
Tetrachloroethene	30	13.6 U	11.1	2.56
Toluene	~	15.4	2.28	0.754 U
Trichlorofluoromethane	~	14.4	1.35	3.41
Trichloroethene	5	1.07 U	4.51	1.07 U
p/m-Xylene	~	17.4 U	3.58	1.74 U
o-Xylene	~	8.69 U	2.06	0.869 U

Notes:

1. Soil vapor sample analytical results are compared to the New York State Department of Health (NYSDOH) Air Guideline Values (AGVs).
2 µg/m³ = micrograms per cubic meter
3. ~ = This indicates that no NYSDOH Soil Vapor Decision Matrix concentration has been established for this analyte.
4. Only constituents detected in one or more samples are presented on this table.

Qualifiers

U = Analyte not detected at or above the level indicated

APPENDIX A

PHASE I ENVIRONMENTAL SITE ASSESSMENT

for

450 Union Street
Brooklyn, New York

Prepared For:

450 Union Street LLC
20 Jay Street, Suite 1003
Brooklyn, New York

Prepared By:

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
21 Penn Plaza
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DRAFT

Michael Burke, CHMM, LEED AP
Senior Associate

May 2, 2014
Langan Project No. 170301201

LANGAN

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EXECUTIVE SUMMARY

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) was retained by 450 Union Street LLC to prepare a Phase I Environmental Site Assessment (ESA) for the property located at 450 Union Street in Brooklyn, New York ("Subject Property"). The Subject Property is identified as New York City Tax Block 438, Lot 7 in the Gowanus neighborhood of Brooklyn. The legal addresses for the lot are 307-309 Bond Street and 450-482 Union Street. The Subject Property is located on the city block bordered by Union Street to the north, the Gowanus Canal to the east, President Street to the south, and Bond Street to the west. This Phase I ESA has been completed for due diligence associated with a potential real estate transaction involving the Subject Property.

The approximately 28,500-square-foot (SF) Subject Property contains a 9,880 SF, one-story commercial building and two storage sheds. The exterior portion of the property contains an enclosed area for social events, a parking lot and driveway, and storage areas. A bulkhead consisting of a 12-foot high headwall supported by timber cribbing separates the property from the Gowanus Canal. The site building is currently divided for use as a private event space, art gallery, and commercial metal working facility. The Subject Property has been utilized for commercial and manufacturing operations since at least 1886, and historically contained a garage (1918 – 1930), foundry (1930 – 2007), and fuel company (1931). The existing building was constructed in approximately 1920.

Based on historical documentation and Langan's experience in this area of Brooklyn, we estimate that the minimum depth of bedrock is 100 feet below surface grade. The property is covered entirely with impervious surfaces (i.e., concrete floor slabs and asphalt and concrete paving), with the exception of an area of exposed soil on the southeastern portion of the property. Sub-surface soil is comprised of historic fill and native soil consisting of silt and sand. Based on the general topography of the surrounding area, inferred groundwater flow is to the east towards the adjoining Gowanus Canal. The depth to groundwater is about 8 feet below surface grade.

This Phase I ESA was conducted in general conformance with the American Society for Testing Materials (ASTM) Standard Practice for Environmental Site Assessments E1527-13 and the United States Environmental Protection Agency's (EPA's) All Appropriate Inquiry (AAI) Rule, for the purpose of identifying Recognized Environmental Conditions (RECs) in connection with the Subject Property. The Phase I ESA identified the following RECs, de minimis conditions, and other environmental concerns associated with the Subject Property:

REC 1 – Petroleum-Contaminated Soil

A Phase II ESI conducted in 2002 revealed that sub-surface soil on the eastern portion of the Subject Property contained SVOCs at concentrations above the NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives and indicative of a potential petroleum spill.

REC 2 – Underground Vault

An approximately 10-ft by 20-ft, steel plate-covered, underground vault is located in the metal working area in the eastern portion of the site building. The interior of the vault was inaccessible during the site reconnaissance. The vault may have been used historically for the storage of hazardous materials.

REC 3 – Historical Site Usage and Abandoned Gasoline Tank

Historical use of the Subject Property included a garage (1918 – 1930), foundry (1930 - 2007), and fuel company (1931), which may have resulted in unreported leaks or spills of petroleum, solvents, and other hazardous substances. The foundry was also listed as Large Quantity Generator of hazardous waste in 1984. In addition, an inactive gasoline UST registered under NYSDEC PBS No. 2-611519 was located on the eastern exterior portion of the Subject Property between at least 1938 and 2007. The location of the tank was confirmed by geophysical methods during a 2002 Phase II ESI. Potential unreported leaks or spills may be associated with the UST.

REC 4 –Current and Historical Surrounding Property Use

The following current and historical uses of surrounding properties may have adversely impacted soil, groundwater, and soil vapor at the Subject Property:

- Large-scale commercial fuel storage facility (Bayside Fuel Oil Depot Corp.) on the northern adjoining property at 505-517 Union Street (1928 – present).
- Private garage with two gasoline tanks on northern adjoining property at 487-501 Union Street (1950 - 2007).
- Automotive repair (1950 – 2007) and auto wrecking facility (1969 – 2007) on the southern adjoining property at 315 Bond Street. The wrecking facility was also listed as a CERCLIS NFRAP site and Conditionally Exempt Small Quantity Generator of hazardous waste in 1998.
- Scrap metal facility (1965 – 1970) on the western adjoining property at 320 Bond Street.

- Automotive repair (1969 – 2007) at 326 Bond Street approximately 50 feet southwest of the Subject Property.
- Electroplating operation (Regency Service Carts) located 390 feet southwest and up-gradient of the Subject Property at 337-361 Carroll street. The facility was listed as a generator of hazardous waste in 1996 and 2006.

REC 5 – Spills on Surrounding Properties

The following spills on nearby sites may have adversely impacted soil, groundwater, and/or soil vapor on the Subject Property:

- Petroleum spill (NYSDEC Spill No. 0902825) resulting in dissolved-phase groundwater and free-phase petroleum product contamination on the northern adjoining Bayside Fuel Oil Depot Corp. property.
- Petroleum-contaminated soil (NYSDEC Spill No. 0706319) near the western approach to the Union Street Bridge, which adjoins the Subject Property to the north.
- Petroleum spill (NYSDEC Spill No. 0102612) resulting in contaminated soil on the western adjoining property at 316 Bond Street.
- Federal CERCLIS NPL (i.e., Superfund) site consisting of the Gowanus Canal, which adjoins the Subject Property to the east.

Non-ASTM Environmental Concerns and De Minimis Conditions

- Multiple sumps and floor drains at the Subject Property represent potential pathways for contaminants to migrate from surface run-off into sub-surface soil.
- Based on the age of the site building, building materials may contain asbestos-containing material, lead-based paint, or polychlorinated biphenyls (PCBs).
- The current FEMA Advisory Base Flood Elevation Maps include new advisory flood zone boundaries and advisory base flood elevations. This map indicates that the site falls within the advisory limit of the 0.2% Annual Chance Flood Hazard Area.

No controlled or historical RECs (CRECs or HRECs) were identified. Additional information related to the above listed RECs can be found within the body of this report.

1.0 INTRODUCTION

Langan was retained by 450 Union Street LLC to prepare a Phase I Environmental Site Assessment (ESA) for the property located at 450 Union Street in Brooklyn, New York ("Subject Property"). The Subject Property consists of one lot identified as New York City Tax Block 438, Lot 7 in the Gowanus neighborhood of Brooklyn. This Phase I ESA has been completed for due diligence associated with a potential transaction involving the Subject Property, and in general accordance with the ASTM 1527-13 (Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process) and the United States Environmental Protection Agency's (EPA) All Appropriate Inquires (AAI) Rule.

The purpose of this ESA is to accomplish the following:

> (1) Identify Recognized Environmental Conditions (REC) in connection with the Subject Property, as defined in The Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E1527-13, which states: The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.
>
> (2) Satisfy the criteria of United States Environmental Protection Agency 40 CFR Part 312 Subpart C Standards and Practices §312.20 All Appropriate Inquiries.

1.1 Scope of the ESA

This ESA was conducted utilizing a standard of good commercial and customary practice that is consistent with ASTM E1527-13. Any significant scope-of-work additions, deletions, or deviations to ASTM E1527-13 are noted in Section 8.0 of this report. In general, the scope of this assessment consisted of obtaining information from the User; reviewing reasonably ascertainable information and environmental data relating to the Subject Property; reviewing maps and records maintained by federal, state, and local regulatory agencies; interviewing persons knowledgeable about the Subject Property; and conducting a site inspection. The specific scope of this assessment included the following:

1. A site reconnaissance to inspect on-site conditions and assess the Subject Property and surrounding property uses and natural surface features. Photographs taken as part of the site reconnaissance are provided in Appendix A.
2. A review of the responses to the User/Client Questionnaire. The completed questionnaire is provided in Appendix B.
3. A review of an available previous report completed for the Subject Property. A copy of the report is included in Appendix C.
4. A review of environmental databases maintained by the USEPA, state, and local agencies within the approximate minimum search distance. The environmental database report was provided by Environmental Data Resources, Inc. (EDR), and is included in Appendix D.
5. Filing of Freedom of Information Act (FOIA) requests with federal, state, and local agencies. Copies of the FOIA requests are included in Appendix E.
6. A review of New York City Department of Buildings (NYCDOB) records and a Planning Commission Zoning Map. Available NYCDOB records and the Zoning Map are included in Appendices F and G, respectively.
7. A review of physical characteristics of the Subject Property through a review of referenced sources for topographic, geologic, soils and hydrologic data.
8. A review and interpretation of aerial photographs, Sanborn Fire Insurance Maps (Sanborn Maps), historical topographic maps, and city directories to identify previous activities on and in the vicinity of the Subject Property. Copies are included in Appendices H, I, J and K, respectively.
9. A review of an Environmental Lien search for the Subject Property. A copy of the environmental lien search report is included as Appendix L.
10. A review of published radon occurrence maps to evaluate whether the Subject Property is located in an area with a propensity for elevated radon levels.

1.2 Assumptions, Limitations, and Exceptions

This Phase I ESA report was prepared for 450 Union Street LLC for the Subject Property located at 450 Union Street (Block 438, Lot 7) in Brooklyn, New York. The report is intended to be used in its entirety. Excerpts taken from this report are not necessarily representative of the assessment findings. Langan cannot assume responsibility for use of this report for any property other than the Subject Property addressed herein, or by any other third party without a written authorization from Langan.

Langan's scope of services, which is described in Section 1.1, was limited to that agreed to with 450 Union Street LLC and no other services beyond those explicitly stated are implied. The services performed and agreed upon for this effort comports to those prescribed in the ASTM Standard E1527-13. Intrusive sampling (i.e., soil borings and groundwater sampling) was not performed as part of this Phase I ESA.

This Phase I ESA was not intended to be a definitive investigation of possible environmental impacts at the Subject Property. The purpose of this investigation was limited to determining if there is reason to suspect the possibility of RECs at the Subject Property. It should be understood that even the most comprehensive Phase I ESA might fail to detect environmental liabilities at particular Subject Property. Therefore, Langan cannot "insure" or "certify" that the Subject Property is free of environmental impacts. No expressed or implied representation or warranty is included or intended in this report, except that our services were performed, within the limits prescribed by our client, with the customary standard of care exercised by professionals performing similar services under similar circumstances within the same jurisdiction.

The conclusions, opinions, and recommendations provided in this report are based solely on the specific activities as required for the performance of ASTM E1527-13 and are intended exclusively for the purpose stated herein, at the specified Subject Property, as it existed at the time of our site visit.

2.0 SITE DESCRIPTION

2.1 Location and Description

The Subject Property occupies approximately 28,500 square feet (SF) in the Gowanus neighborhood of Brooklyn. The Subject Property contains a 9,880 SF commercial building and two storage sheds. The exterior portion of the property contains an enclosed area for social events, a parking lot and driveway, and storage areas. A bulkhead consisting of a 12-foot high headwall supported by timber cribbing separates the property from the Gowanus Canal. The site building is currently divided for use as a private event space, art gallery, and commercial metal working facility. The Subject Property has been utilized for commercial and manufacturing operations since at least 1886, and historically contained a garage (1918 – 1930), foundry (1930 – 2007), and fuel company (1931). The existing building was constructed in approximately 1920.

The Subject Property is located on the city block bordered by Union Street to the north, the Gowanus Canal to the east, President Street to the south, and Bond Street to the west. Mixed-use industrial, manufacturing, commercial, retail, and residential buildings characterize the surrounding area. A Site location Map is included as Figure 1. Site reconnaissance photographs are presented in Appendix A.

2.2 Description of Site Improvements

Improvements at the Subject Property are summarized in the following table:

SITE IMPROVEMENTS	
Size of the Subject Property	Approximately 28,500 square feet
Buildings/Spaces/Structures	• 1-story masonry commercial building • Two storage sheds • Exterior parking lot, driveway, storage area, and enclosed space for social events.
Surface Water	Surface water is not located on the Subject Property.
Potable Water Source	New York City
Sanitary and Storm Sewer Utilities	New York City
Electrical Utilities	Con Edison
Construction Completion Date	1920
General Construction Type	Brick and concrete masonry
Cooling and Ventilation System Type	Forced air

SITE IMPROVEMENTS	
Heating System Type	Forced air (natural gas-supplied)
Emergency Power	None

2.3 Title Records

Langan researched ownership records for the Subject Property at the Automated City Register Information System (ACRIS) website (http://www.nyc.gov/html/dof/html/jump_/acris.shtml). Deed and other conveyance information for Block 438, Lot 7 is summarized in the following tables.

Block 438, Lot 7			
Date	**Document Type**	**First Party**	**Second Party**
12/7/2004	Deed	Venetian, LLC	Union Street Development, LLC and Meadow Street Partners, LLC
12/23/2003	Deed, other	Regency Service Carts, Inc	Venetian, LLC
9/19/1994	Deed	Thomas Paulson & Son, Inc	Regency Service Carts, Inc
2/21/1990	Lease	Thomas Paulson & Son, Inc	Regency Service Carts, Inc

Langan's review of ownership records revealed that Thomas Paulson & Son, Inc., a brass foundry, was present at the property until at least 1990. Based on the potential for uncontrolled solvent and chemical spills associated with operations at the foundry, the former metal foundry is considered a REC.

3.0 USER PROVIDED INFORMATION

3.1 User Questionnaire

As per ASTM E1527-13, a questionnaire was provided to the User in order to obtain specialized User knowledge. The User questionnaire was completed by AJ Pires, agent on behalf of 450 Union Street LLC. Mr. Pires stated that he is not aware of any environmental cleanup liens, land use limitations, or spills at the Subject Property. He believes that the purchase price of the properties reasonably reflects the fair market value and knows the past uses of the property. He is not aware of chemical releases. The completed questionnaire is included in Appendix B.

3.2 Previous Environmental Reports

Phase II Site Investigation Report (460 Union Street), dated May 2002, prepared by AKRF, Inc.

AKRF, Inc. prepared a Phase II Site Investigation Report (SIR) of the Subject Property on behalf of The Corcoran Group in May 2002. The report included review of an October 2001 Phase I Environmental Site Assessment and June and July 2001 Phase II Subsurface Investigation Report prepared by New York Petroleum & Drilling Corp (NYP&D). The NYP&D reports identified the following environmental concerns:

- The site building historically housed metal working and refining, suggesting possible metals contamination in the on-site soil.
- The north-adjacent property was listed as a large fuel oil depot facility with a total capacity in excess of 1,500,000 gallons.
- Elevated levels of semi-volatile organic compounds (SVOCs) above the applicable regulatory standards at the time [TAGM 4046 Recommended Soil Cleanup Objectives]) were detected in two on-site and two off-site soil borings immediately north of the Subject Property.

AKRF reviewed regulatory databases and historical fire insurance maps, and conducted a geophysical survey and soil and groundwater investigation. The investigation consisted of soil sampling from five on-site and two off-site soil borings and groundwater sampling from one on-site and one off-site monitoring well. All borings were completed to 12 feet below surface grade, with the exception of two that were extended to 16 feet below surface grade to accommodate monitoring well installation. The report provided the following findings:

- The property was listed in the New York State Department of Environmental Conservation (NYSDEC) SPILLS database for No. 2 fuel oil-contaminated soil that was discovered during the NYP&D investigation. The site was also listed as a Toxic Release Inventory site with no further information, a permanently closed Air Discharge Facility,

and a Large Quantity Generator with no hazardous waste activity reported to New York State.

- The northern adjacent property, Bayside Fuel Oil Company at 285 Bond Street, was listed as a Petroleum Bulk Storage (PBS) facility with 14 550-gallon underground storage tanks (USTs) containing kerosene and diesel fuel. The Bayside site was listed in the NYSDEC SPILLS database for a 1998 spill of approximately 20 gallons of diesel fuel.
- Historical Sanborn maps indicated that a gasoline tank was located south of the former foundry building between 1950 and 2001.
- Magnetic anomalies indicative of a 550-gallon UST were identified adjacent to a stained and cracked concrete pad located on the southeastern portion of the Subject Property.
- Analytical laboratory analytical results revealed the presence of volatile organic compounds (VOCs), SVOCs, metals and pesticides in soil at the site. SVOCs were detected in soil samples throughout the site at concentrations exceeding the TAGM RSCOs (and current Part 375 Unrestricted Use Soil Cleanup Objectives). The highest SVOC concentrations (i.e., > 100 parts per million) were detected in the sample collected from a depth of 3 to 5 feet below surface grade near the suspected UST. AKRF concluded that the highest detected SVOC concentrations in the vicinity of the tank were indicative of a potential petroleum release. The moderate SVOC concentrations in other samples were attributed to background conditions in the historic urban fill. Metals and pesticides were detected at concentrations that moderately exceeded the TAGM RSCOs (and Part 375 Unrestricted Use SCOs), but were within the range commonly observed in historic fill. PCBs were not identified in any of the soil samples.
- Groundwater samples did not contain compounds at concentrations above the NYSDEC Class GA (drinking) water standards.

Langan's regulatory database review did not confirm the existence of a historical spill reported at the Subject Property in 2001. A 2001 spill ascribed to the site address appears to be associated with an apartment building west of the Subject Property on Bond Street (discussed below). The presence of VOCs and elevated concentrations of SVOCs in soil samples indicates a potential petroleum release at the site, and therefore constitutes a REC.

Draft Gowanus Canal Remedial Investigation Report, dated January 2011, prepared by Henningson, Durham, & Richardson Architecture & Engineering, P.C. (HDR) and CH2M Hill

And

Gowanus Canal Superfund Site Potentially Responsible Party (PRP) Search Status – October 2012

A Remedial Investigation (RI) was conducted on behalf of the United States Environmental Protection Agency (USEPA) Region 2 to investigate the Gowanus Canal Superfund Site, which was placed on the USEPA National Priorities List (NPL) of hazardous waste in March 2010. The RI was conducted in 2010 and included field sampling and data collection from the canal and nearby properties that represented potentially responsible parties (PRPs), i.e., possible historical contributors of contamination to the canal. The RI was conducted in three phases and consisted of multiple surveys (e.g., bathymetric and combined sewer outfalls), sediment coring, and sampling and analysis of surface sediment, surface water, air, combined sewer overflow, groundwater, and fish and shellfish tissue.

No sampling or data collection was conducted on the Subject Property. The nearest sampling locations consisted of (1) three sediment cores collected adjacent to the Subject Property in a lateral traverse across the canal, (2) a surface sediment sample and surface water sample collected in the center of the canal adjacent to the Subject Property, and (3) a groundwater sample collected from a monitoring well (MW-3) installed on the northern adjoining property (Bayshore Fuel Depot) near Sackett Street. The analytical results indicated elevated concentrations of polynuclear aromatic hydrocarbons (PAHs) (i.e., 84,300 µg/kg), no detected polychlorinated biphenyls (PCBs), and a comparatively low lead concentration (i.e., 230 mg/kg) in the adjacent surface sediment sample. No evidence of non-aqueous phase liquid (NAPL) (i.e., free-phase petroleum product) was observed in the shallow soft sediment samples collected from the two cores adjacent to the Subject Property. However, the same two cores contained NAPL-saturated soil within samples of deeper native sediment. A minimum of two VOCs (1,2,4-trichlorobenzene and 1,3-dichlorobenzene) were detected in the adjacent surface water sample, and multiple VOCs, SVOCs, and dissolved metals were detected in the groundwater sample collected from the northern adjoining property; of these, one SVOC and one dissolved metal were detected at concentrations above the ecological and human health screening values.

Neither the existing Subject Property owner nor the previous owners listed in the above title search were named in the October 2012 PRP list. USEPA sent an information request letter with response pending to Regency Service Carts, Inc., which owned the property between 1994 and 2003, in December 2011. Regency Service Carts also appears to have operated an electroplating facility approximately 400 feet southwest of the Subject Property at 337-361 Carroll Street between at least 1994 and 2007 (discussed further in Section 4.0). As such, operations at the Carroll Street facility are the probable reason for USEPA's request. Bayside Fuel Oil Corp., which operates the northern adjoining property, was named as a PRP. Based on the absence of the Subject Property on the PRP list and the presence of PRPs in the vicinity

(i.e., Bayside Fuel Oil Corp. and the Fulton Former MGP Site), historical operations at the Subject Property likely did not contribute significantly to contamination in the Gowanus Canal. The presence of contaminated sediment within the canal is considered a REC, due to the potential for migration of contaminated water from the canal onto the Subject Property through breaches in the bulkhead.

4.0 ENVIRONMENTAL RECORDS

A regulatory database search was provided by Environmental Data Resources, Inc. (EDR) and is included in Appendix D. The EDR report provides a listing of sites identified on select federal and state standard source environmental databases within the approximate search radius specified by ASTM E1527-13. Langan reviewed each environmental database on a record-by-record basis to evaluate whether the identified sites represent a potential for environmental impact to the Subject Property. Langan also reviewed "Orphan Sites" listed within the report. Orphan Sites are those sites that could not be mapped due to inadequate address information. Any Orphan Sites that were identified by Langan within the ASTM search radii, either during the site reconnaissance or by cross-referencing to mapped listings, are addressed in the discussion below.

The following table lists the number of sites identified in standard and additional environmental record databases, within the prescribed search radius and appearing in the EDR Report.

DATABASE RECORD SUMMARY			
Database Reviewed (Date of government version)	**Minimum Search Area**	**Subject Property listed**	**Number of Sites Within Minimum Search Area**
USEPA DATABASES			
National Priorities List (NPL) (10/25/2013)	1 Mile Radius	No	1
Delisted NPL (10/25/2013)	1 Mile Radius	No	0
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and CERCLIS-NFRAP (10/25/2013)	1/2 Mile Radius	No	3
Resource Conservation and Recovery Act (RCRA) Corrective Reports (CORRACTS) (9/10/2013)	1 Mile Radius	No	1
RCRA Treatment, Storage, and Disposal Facilities (TSDF) (9/10/2013)	1/2 Mile Radius	No	0
RCRA Generators (RCRA-LQG, RCRA-SQG, RCRA-CESQG) (9/10/2013)	¼ Mile Radius	No	9
Facility Index System (FINDS) (11/18/2013)	Subject Property	Yes	1
Environmental Response Notification System (ERNS) (9/30/2013)	Subject Property	No	0
Engineering Controls (ENG) Sites Lists (12/17/2013)	Subject Property	No	0

DATABASE RECORD SUMMARY			
Database Reviewed (Date of government version)	**Minimum Search Area**	**Subject Property listed**	**Number of Sites Within Minimum Search Area**
Institutional Controls (INST) Sites Lists (12/17/2013)	Subject Property	No	0
NYSDEC DATABASES			
Hazardous Waste Disposal Sites (SHWS) and delisted SHWS (2/17/2014)	1 Mile Radius	No	8
Solid Waste or Landfill Facilities (SWF/LF) (12/12/2013)	1/2 Mile Radius	No	9
Registered Recycling Facility (SWRCY) (12/12/2013)	1/2 Mile Radius	No	2
Leaking Storage Tanks (LTANKS) (2/17/2014)	1/2 Mile Radius	No	39
SPILLS Information Database (NY SPILLS) (2/17/2014) (N/A)	1/8 Mile Radius	Yes	44
NY Voluntary Cleanup Program (VCP) (2/17/2014)	1/2 Mile Radius	No	1
Brownfields (2/17/2014)	1/2 Mile Radius	No	7
Engineering Control (EC) Sites (2/17/2014)	Subject Property	No	1
Institutional Control (IC) Sites (2/17/2014)	Subject Property	No	1
Chemical Bulk Storage (CBS) Underground storage tank (UST) and aboveground storage tanks (AST) (12/30/2013)	Subject Property and Adjoining	No	1
Major Oil Storage Facilities (MOSF) UST and AST Databases (12/30/2013) (N/A)	1/2 Mile Radius	No	1
Registered and Historical Drycleaners (DRYCLEANERS) (1/21/2014)	1/4 Mile Radius	No	3
Petroleum Bulk Storage Facilities (PBS) UST and AST Databases (12/30/2013)	1/4 Mile Radius	Yes	36
E-Designation (12/10/2013) (N/A)	1/4 Mile Radius	No	3
EDR (PROPRIETARY) DATABASES			
EDR Former Manufactured Gas Plant (MGP) Sites (N/A)	1 Mile Radius	No	5
EDR US Historical Auto Stations (N/A)	¼ Mile Radius	No	22
EDR US Historical Cleaners (N/A)	¼ Mile Radius	No	2

USEPA – United States Environmental Protection Agency

NYSDEC – New York State Department of Environmental Conservation
N/A – Not Applicable; databases are reviewed as part of the Phase I ESA but not required as per ASTM E1527-13.

A description of the reviewed databases is provided in the EDR Report (Appendix D). A summary of sites identified within the prescribed search area is presented below.

4.1 Federal Agency Database Findings

NPL Database

The National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The Subject Property was not listed on the NPL database. The following adjoining site was identified in the NPL database within the minimum search criteria:

- **Site Name: Gowanus Canal**
  Site Address: N/A
  Location: Adjoins the site to the east; hydraulically down-gradient of the Subject Property.
  Description: The Gowanus Canal runs through a highly developed area in Brooklyn, New York and is impacted by contaminated sediments, principally due to the activities of former Manufactured Gas Plants (MGPs). Surface sediments contain PCBs at levels up to 350 ppm, and coal tar residue up to 23% by weight of sample. Based on the potential for migration of contaminated water from the canal onto the Subject Property through breaches in the bulkhead, the canal is considered a REC.

CERCLIS and CERCLIS NFRAP Database

The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites that are either proposed or on the NPL and sites which are in the screening assessment phase for possible inclusion on the NPL. CERCLIS NFRAP sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived sites indicates that, to the best of USEPA's knowledge, assessment at a site has been completed and that USEPA had determined no further steps will be taken to list this site on the NPL, unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The Subject Property was not listed in the CERCLIS or CERCLIS NFRAP databases. One CERCLIS site (eastern adjoining property) and two

CERCLIS-NFRAP sites, including the southern adjoining property, were identified within the minimum search distance, and are described below:

- **Site Name: Gowanus Canal**
  Site Address: N/A
  Location: Adjoins the Subject Property to the east; hydraulically down-gradient of the Subject Property.
  Description: The site is considered a REC and discussed above as an NPL listing.

- **Site Name: VIDAN Auto Salvage**
  Site Address: 327-321 Bond Street
  Location: Adjoins the Subject Property to the south; hydraulically up-gradient/cross-gradient of the Subject Property.
  Description: The site has been assigned NFRAP status and was historically listed as a Conditionally Exempt Small Quantity Generator. A preliminary and removal assessment were completed in September 1991. Following a site assessment in 1998, the site was categorized as an NFRAP site. Based on its distance from the site and the potential for chemical and petroleum spills associated with the salvage operations, the site is considered a REC.

- **Site Name: Brooklyn Union Gas/Citizens Gate Station**
  Site Address: 6th Street and 2nd Avenue
  Location: Approximately 1,951 feet southwest and hydraulically down-gradient of the Subject Property.
  Description: Based on its NFRAP status and distance from the Subject Property, the site is not considered a REC.

RCRA CORRACTS Database

The RCRA CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity. The Subject Property was not listed in the RCRA CORRACTS database; however, one surrounding property was identified and is described below:

- **Site Name: Patterson Chemical Co., Inc.**
  Site Address: 102 3rd Street
  Location: Approximately 1,182 feet southwest and hydraulically up-gradient of the Subject Property.

Description: The site is listed as a treatment, storage, or disposal facility for hazardous waste. On December 21 and 22, 1982 a total of 3,355 gallons and 825 gallons of K078-unknown waste were disposed in a dump truck and 15 drums, respectively. On April 11, 1983, 215 gallons of F006 listed wastewater sludge from electroplating operations were disposed in 5 drums. On December 18, 1984, 110 gallons of D001 non-listed ignitable wastes were disposed in 2 drums. On September 9, 2013, 16,583 liters of an unreported waste type were disposed in a tank truck. Based on its CORRACTS status as low corrective action priority and distance from the Subject Property, the site is not considered a REC.

RCRA Generators Database

The RCRA generators/transporters database is USEPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites that generate, transport, store, treat and/or dispose of hazardous waste as defined by RCRA. RCRA Databases include Large Quantity Generators (LQG), Small Quantity Generators (SQG), Conditionally Exempt Small Quantity Generators (CESQG), and Non Generators (NonGen). The Subject Property was listed in the RCRA NonGen/NLR database, as described below:

- **Site Name: Thomas Paulson & Son, Inc.**
  Site Address: 450 Union Street
  Description: The site was listed as a RCRA-LQG in 1984. No manifests were available for review that would indicate the type of RCRA waste(s) generated at the Subject Property. No violations were associated with the listing. According to the EPA RCRIS Facility Detail Report, the facility was categorized as an aluminum foundry. The historical on-site handling of hazardous waste constitutes a REC.

Nine surrounding properties were also listed in the RCRA database. Seven of the properties were either located more than 850 feet from the Subject Property or east of the Gowanus Canal, and are therefore not considered RECs. The remaining site is described below:

- **Site Name: Regency Service Carts**
  Site Address: 337-361 Carroll Street
  Site Location: Approximately 390 feet southwest and hydraulically up-gradient of the Subject Property
  Description: This facility was listed as a CESQG in 1994, a LQG in 1996, a SQG in 2006, and a Non-Gen in 2007. Waste types included spent cyanide plating bath solutions from electroplating operations (F007) from as early as January 1995 through

September 2012. Two violations (one "general" and one related to manifests) were issued in July 1995; subsequent compliance was achieved for both violations in September 1995. Based on the up-gradient location and potential for metal impacts associated with operations at the site, the facility is considered a REC.

Four RCRA-CESQG are located within ¼ mile of the Subject Property. The facilities are either located more than 800 feet from the Subject Property or east of the Gowanus Canal, and are therefore not considered RECs.

FINDS Database

The Facility Index System (FINDS) database contains both facility information and "pointers" to other sources that contain more detail. The Subject Property was listed in the FINDS database and described below:

- **Site Name: Thomas Paulson & Son Incorporated**
  Site Address: 450 Union Street
  Description: The FINDS status corresponds to the property's listing as a RCRA-LQG in 1984, which is considered a REC and discussed above, and listing in the US EPA Toxics Release Inventory System (TRIS). The TRIS contains facility information related to toxic chemicals that can be released into air, water, and land, or are transported off site. No additional information regarding the TRIS listing was provided.

Unlisted Databases

No Delisted NPL, RCRA TSDF, ERNS, ENG, or INST sites were listed within the respective minimum search distances as specified by ASTM E1527-13.

4.2 State Agency Database Findings

SHWS Database

The State Hazardous Waste Sites (SHWS) records are the states' equivalent to CERCLIS and may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The Subject Property was not listed in the SHWS database. Seven SHWS sites and one delisted SHWS site were identified within the minimum search distance of one mile. All but one of the listed sites were either located more than 2,000 feet from the Subject Property or down-gradient, and are therefore not considered RECs. The eastern adjacent Gowanus Canal was also listed and is considered a REC, based on its EPA NPL listing, as discussed above.

NY SWF/LF Database

The Solid Waste Facility/Landfill (SWF/LF) database is a comprehensive listing of State permitted/recorded solid waste facilities. The Subject Property was not listed in the SWF/LF database; however, nine SWF/LF sites were identified within 1/2 mile of the Subject Property. One active SWF/LF facility, the Gowanus Canal Conservancy, Inc., is located 1,528 feet south-southwest and down-gradient of the Subject Property. The remaining sites are inactive SWF/LF facilities. The nearest site is located 384 feet down-gradient of the Subject Property and all other inactive sites are located greater than 800 feet from the Subject Property. Based on the regulatory status, distances and locations of these sites relative to the Subject Property, the facilities are not considered RECs.

NY SWRCY Database

The Solid Waste Recycling (SWRCY) database is a comprehensive listing of State registered recycling facilities. The Subject Property was not listed in the SWRCY database. Two NY SWRCY sites are located within ½ mile of the Subject Property. Based on their distance of more than 1,600 feet from the Subject Property, the facilities are not considered RECs.

NY LTANKS Database

The leaking storage tanks database contains an inventory of reported leaking storage tank incidents, including leaking USTs and ASTs. The primary causes of the LTANK incidents include tank test failures, tank failures, and tank overfills. As per ASTM E1527-13, the approximate minimum search distance required for LTANK incidents is within ½ mile of the Subject Property.

Thirty-nine LTANK incidents were identified at surrounding properties within a ½-mile radius of the Subject Property. Thirty-seven of these LTANK incidents are closed to the satisfaction of NYSDEC and are not considered RECs. The nearest open LTANK case (473 President Street) is located approximately 480 feet southeast of the Subject Property across the Gowanus Canal, which would act as a barrier to contamination originating from that site. As such, the site is not considered a REC.

NY SPILLS Database

The Spills database, maintained and updated by NYSDEC, is an inventory of sites where spills have been identified and reported to the NYSDEC. The Subject Property was listed in the SPILLS database as described below:

- **Site Name: Vacant Apartment Building**
  Site Address: 450 Union Street

Description: Spill No. 0102612 was reported on June 8, 2001 after soil testing at the property indicated contamination was present. The spill was closed on December 17, 2009, due to insufficient information. Information entered by NYSDEC indicates that the site address has been inaccurately ascribed to the Subject Property. The spill was associated with an apartment building that is likely located at 316 Bond Street, which adjoins the Subject Property to the west across Bond Street. Based on the absence of sampling information related to the incident, contaminants originating from the spill may have migrated on the Subject Property. The spill is therefore considered a REC.

Forty-three NY SPILLS incidents were identified at surrounding properties within 1/8-mile of the Subject Property. Thirty-nine of the SPILLS incidents were closed by the NYSDEC. Bayside Fuel Oil Depot Corp., the northern adjoining property, is associated with six historic spills that are administratively closed. The most recent spill is described below.

- **Site Name: Bayside Fuel Oil Depot Corp.**
  Site Address: 510 Sackett Street
  Location: Adjoins the Subject Property to the north; hydraulically cross-gradient from the Subject Property.
  Description: Spill No. 0902825 was reported on June 9, 2009 following detection of petroleum contamination in soil and groundwater. Contamination included free-phase petroleum product and dissolved-phase petroleum compounds in groundwater. Cleanup of the site was administered under a Remedial Action Plan, and included product removal. The spill was closed on February 6, 2012 following completion of two years of gauging of five on-site monitoring wells. During the monitoring period, observations of free-phase product were limited to a trace (<0.01 foot) detected in March 2011 in one of the wells. Based on the potential for off-site migration of dissolve-phase contamination associated with the spill, the listing is considered a REC.

In addition, a historic spill was reported in the vicinity of the western approach to the adjoining Union Street bridge. Details are provided below.

- **Site Name: Union Street Bridge**
  Site Address: Western approach to Union Street Bridge
  Location: Adjoins the Subject Property to the north; hydraulically cross-gradient from the Subject Property.
  Description: Spill No. 0706319 was reported on September 5, 2007 following the detection of elevated levels of VOCs in soil encountered during a geotechnical investigation associated with refurbishing of the bridge. NYSDEC noted that the boring was adjacent to the Bayside Fuel Depot, which was a possible source for the impacts.

The spill was closed in August 2011, based on evidence for an off-site source and exemption of the site as a utility. Based on the proximity of the spill to the Subject Property and the unresolved origin and extent of the spill, the incident is considered a REC.

The remaining open spills are either located more than 600 feet from the Subject Property or east of the Gowanus Canal, and are therefore not considered RECs.

NY VCP

Voluntary Cleanup Program (VCP) sites are properties at which redevelopment or re-use may be complicated by the presence or potential presence of hazardous substances, pollutants, or contamination. The Subject Property was not listed in the VCP database. One VCP site, K-Citizens MGP-Carroll Gardens, was identified within 1/2 mile of the Subject Property. The VCP site is located more than 2,000 feet from the Subject Property and is therefore not considered a REC.

Brownfield Sites

Brownfield sites are properties at which redevelopment or re-use may be complicated by the presence or potential presence of hazardous substances, pollutants, or contamination. The Subject Property was not listed as a Brownfield site. Seven Brownfield sites were identified within 1/2 mile of the Subject Property. Six of the brownfield sites are either located more than 400 feet from the Subject Property, cross-gradient from the Subject Property, or east of the Gowanus Canal. One site is listed on the northern adjoining property and is discussed below.

- **Site Name: Bayside Fuel Oil Depot Corp.**
  Site Address: 510 Sackett Street
  Description: The site was a Major Oil Storage Facility (MOSF) with a 1,500,000 gallon fuel oil capacity that was enrolled in the BCP on May 12, 2005. Past operations include coal storage, a lumber yard, a box factory, an automotive and truck repair garage, warehousing, and a motor freight station. The site is associated with fuel oil contamination and multiple spill cases. Based on the potential for migration of contaminants associated with the above operations as well as historic spills related to the site (discussed above), the facility is considered a REC.

NY PBS TANKS, UST and AST Database

The Petroleum Bulk Storage (PBS) TANKS, UST and AST database contains records of registered USTs and/or ASTs. A registered petroleum bulk storage tank, UST and/or AST does not constitute a REC, in and of itself. However, properties listed on the TANKS, UST and/or

AST lists with a reported leak, spill, or release could constitute a REC with respect to the Subject Property. As per ASTM E1527-13, the minimum search distance required for USTs and ASTs is the Subject Property and adjoining properties. The Subject Property was listed in the PBS UST database and is described below.

- **Site Name: 450-460 Union Street**
  Site Address: 450-460 Union Street
  Description: The PBS facility No. 2-611519 corresponds to a 550-gallon steel gasoline UST encased in concrete. The tank is labeled as an inactive site (i.e., tank out of service). Meadow Street Partners, LLC are listed as the current owners of 450 Union Street in the PBS record. The probable location of the UST was identified during a geophysical investigation conducted by AKRF in 2002 (discussed above). Based on the potential for unreported spills, the UST is considered a REC.

The following adjoining property was identified in the PBS database and is described below.

- **Site Name: Bayside Fuel Oil**
  Site Address: 498-502 Sackett Street
  Location: Northern adjoining site
  Description: Tank ID 27067 corresponds to a 4,000-gallon steel gasoline UST installed on June 1, 1979 and closed-removed on December 30, 2009. Tank ID's 27068 and 27069 correspond to two 275-gallon steel lube oil AST's installed on June 1, 1985 that are closed-removed. Tank ID's 227669 and 227670 correspond to two 275-gallon steel #2 fuel oil AST's installed on January 1, 1985 that are both in service. Based on the presence of historic petroleum spills associated with the tanks (discussed above), the facility is considered a REC.

NY MOSF Database

The NY Major Oil Storage Facility (MOSF) database contains records from facilities that have the capacity to store at least 400,000 gallons of petroleum product. The Subject Property was not listed in the NY MOSF database. One MOSF site was identified within 1/2 mile, and is described below.

- **Site Name: Bayside Fuel Oil Depot, Corp.**
  Site Address: 510 Sackett Street
  Site Location: Northern adjoining property
  Description: This facility (NYSDEC Facility ID No. 2-1220) is administratively closed. The site was a Major Oil Storage Facility (MOSF) with a 1,500,000 gallon fuel oil capacity that was enrolled in the BCP on May 12, 2005. Based on the presence of

historic petroleum spills associated with the tanks (discussed above), the facility is considered a REC.

NY Drycleaners Database

The NY Drycleaners database includes registered dry cleaning facilities in the State of New York. The Subject Property was not listed in the NY Drycleaners database; however, three dry cleaners (All-Brite Cleaners, Klor-De Cleaners, and Chatham Cleaners) were identified within 1/4-mile of the Subject Property. The Klor-De Cleaners and Chatham Cleaners are located east of the Subject Property across the Gowanus Canal, which acts as a barrier to potential contaminants. All-Brite cleaners is located more than 875 feet north and cross-gradient from the Subject Property. Based on distance and location relative to the Subject Property, the sites are not considered RECs.

E-Designation Database

This database includes lots designated with an "E" on the Zoning Maps of the City of New York for potential hazardous material contamination, air and/or noise quality impacts. The Subject Property and adjacent properties were not identified on the NY E-Designation database.

Unlisted Databases

No EC, IC, CBS UST, or CBS AST sites were listed within their respective minimum search distances as specified by ASTM E1527-13.

4.3 Other Database Findings

Manufactured Gas Plant (MGP) Sites

The Manufactured Gas Plant (MGP) Sites database is a proprietary database that includes records of historical manufactured coal gas plants compiled by EDR. The Subject Property was not listed in the MGP database. Five MGP sites were identified within a one-mile radius of the Subject Property. Three of the sites are located more than 2,000 feet (hydraulically up-gradient) from the Subject Property, and two are located more than 500 feet east of the Gowanus Canal. Based on distance and/or location relative to the Subject Property, the listed sites are not considered RECs.

U.S. Historical Auto Stations

The U.S. Historical Auto Stations database is a proprietary database that includes records of historical auto stations compiled by EDR. The Subject Property was not listed in the U.S. Historical Auto Stations database. Twenty-two U.S. Historical Auto Stations sites were

identified within a ¼-mile radius of the Subject Property. The property identified at 510 Sackett Street is listed as a historical auto station owned by the Bayside Fuel Oil Corp in 2001 and 2002. The Bayside facility is a REC, based on historic spills associated with fuel storage operations, as discussed above.

The remaining sites are either located east of the Gowanus Canal or more than 800 feet from the Subject Property. Based on distance and/or location relative to the Subject Property, the remaining listed sites are not considered RECs.

U.S. Historical Dry Cleaners

The U.S. Historical Dry Cleaners database is a proprietary database that includes records of historical dry cleaners compiled by EDR. The Subject Property was not listed in the U.S. Historical Dry Cleaners database. Two U.S. Historical Dry Cleaners sites were identified within a ¼-mile radius of the Subject Property. One property, the Glen Street Laundry, Inc., was identified in 2007 and 2008 at 470 Sackett Street, located 360 feet northwest and cross-gradient of the Subject Property. The second site was located east of the Gowanus Canal. Based on distance and/or location relative to the Subject Property, the listed sites are not considered RECs.

4.4 Local Regulatory Agency Findings

FOIA Requests

Freedom of Information Act (FOIA) requests were submitted during the week of April 14, 2014 to the following federal, state, and local agencies via written correspondence:

- New York City Department of Environmental Protection (NYCDEP);
- New York City Department of Health (NYCDOH);
- New York City Fire Department (FDNY);
- New York State Department of Health (NYSDOH);
- NYSDEC; and
- USEPA, Region 2.

Responses have not yet been received. Should future responses alter the conclusions of this Phase I ESA, an addendum will be issued. Copies of the FOIA requests are included in Appendix E.

NYCDOB

Langan conducted a records search through the New York City Department of Buildings (NYCDOB) online query system on April 14, 2014. Lot 7 has a Department of Finance classification of E9 – Warehouse. A Certificate of Occupancy (CO) dated June 1918 identifies a single-story garage with steam heating and storage. A second CO dated October 25, 1930 identifies a change in occupancy of the premises from a garage to a foundry shop and office owned by Thomas Paulson and Son, Inc. A third CO dated July 9, 1931 identifies a garage, wood yard, and office owned by Sitron Fuel Corp. Two open Environmental Control Board (ECB) violations related to construction activities on the property occurred in July 2009. No boiler records were available. Historical use of the property by a garage (1918 – 1930), foundry (1930), and fuel company (1931) may have resulted in unreported leaks or spills of petroleum and other compounds. Historical usage of the property is therefore considered a REC. Copies of the relevant NYCDOB database records are included in Appendix F.

Zoning Department

According to the New York City Planning Commission Zoning Map 16c, the Subject Property is located in a M2-1 manufacturing district. M2-1 districts are mapped mainly in the city's older industrial areas along the waterfront. Except when M2 uses border a residential district, higher levels of noise and vibration are allowed, smoke is permitted and industrial activities need not be entirely enclosed. A copy of the zoning map is provided in Appendix G.

4.5 Physical Setting Sources

4.5.1 Topography

Based on the United States Geological Survey (USGS) 7.5 min Digital Elevation Model, the elevation at the Subject Property is approximately 10 feet above sea level. The Subject Property is located along the Gowanus Canal, and is therefore lower than surrounding properties to the west. The general topographic gradient of the Subject Property and surrounding properties to the west slopes east towards the Gowanus Canal, which adjoins the Subject Property to the east.

4.5.2 Geology

Historical soil borings completed at the Subject Property by AKRF, Inc. revealed that the site is underlain by fill consisting of fine to medium sand, with varying amounts of silt, gravel, brick, concrete, coal, wood, and glass across the property. Predominant geological surface features were not observed on the Subject Property. Soil and bedrock stratigraphy throughout Brooklyn typically consists of a layer of historical fill that overlies glacial till, decomposed unconsolidated

bedrock, and bedrock. The USGS "Geologic Map of New York City and Adjacent Part of New Jersey" indicates the bedrock underlying the Subject Property is part of the Hartland Formation. The Hartland Formation is comprised of mica schist and quartz-feldspar granulite, with localized intrusions of granite and pegmatite. Based on a geotechnical investigation completed by Langan in the vicinity of the Subject Property, the minimum depth of bedrock is expected to be 100 feet bgs.

4.5.3 Hydrology

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 hydrogeologic 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.

Based on the general topography of the surrounding area, inferred groundwater flow is to the east towards the Gowanus Canal, which adjoins the Subject Property to the east. AKRF's 2002 Phase II ESI indicated that groundwater is present at about 8 feet below grade beneath the Subject Property. According to the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) effective September 5, 2007, the Subject Property is located within Zone X, "Areas of moderate flood risk within the 0.2% annual chance floodplain; or areas of 1% annual chance flooding where average depths are less than 1 foot, where the drainage area is less than 1 square mile, or areas protected from this flood level by a levee". The base flood elevation is not currently available for the Subject Property. The current FEMA Advisory Base Flood Elevation (ABFE) Maps include new advisory flood zone boundaries and advisory base flood elevations. This map indicates that the site falls within the advisory limit of the 0.2% Annual Chance Flood Hazard Area.

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 surface impoundments in the Croton, Catskill, and Delaware watersheds.

4.6 Historical Use Information

Langan reviewed available historic resources (including aerial photographs, Sanborn and topographic maps, and city directories) dated 1886 to 2011. Findings of the review are presented below.

4.6.1 Aerial Photographs

Langan reviewed aerial photographs of the Subject Property and surrounding areas for the years 1924, 1943, 1954, 1966, 1975, 1984, 1994, 2006, 2009, and 2011. The photographs indicate that the Subject Property was located in a densely developed urban area and improved with buildings as early as 1924. Surrounding properties have been improved with buildings and the Gowanus Canal has adjoined the Subject Property to the east since at least 1924. Commercial/manufacturing facilities (also noted during the Sanborn map review) have occupied properties to the north, east, and south. Historical commercial and manufacturing usage of the site and surrounding properties is considered a REC, as discussed in other sections of this report. Copies of aerial photographs are included in Appendix H.

4.6.2 Sanborn Fire Insurance Maps

Langan reviewed Sanborn Maps for the Subject Property for the years 1886, 1904, 1915, 1928, 1938, 1950, 1969, 1977, 1979, 1980, 1981, 1982, 1986, 1987, 1988, 1991, 1992, 1993, 1995, 1996, and 2001-2007. Sanborn Maps constitute a database of prior site uses of real property for many cities and towns in the United States. A summary of the Sanborn Maps is presented on the following table with environmental concerns in bold. Copies of the maps are provided in Appendix I.

SANBORN MAP SUMMARY	
YEAR	**COMMENTS**
1886	**Subject Property:** The Subject Property is developed with several one-story structures. A large cement pipe runs though the property from west to east. Portions of the lot are labeled "cord wood". Storage operations on the lot appear to be contiguous with those of the southern adjoining property. **Surrounding Area:** Adjoining properties include several 1- to 2-story buildings that are part of Dykman's Box Factory and Schmadeke Coal Yard and lumber yard to the north, the Gowanus Canal to the east, Lidford's Coal and Wood Yard with one 1-story structure to the south, and 3-story apartment dwellings to the west. Surrounding properties include a blacksmith at 326 Bond Street, located about 50 feet west of the Subject Property, lumber yards, coal yards, and lime, brick, and lath yards.

SANBORN MAP SUMMARY	
YEAR	**COMMENTS**
1904	**Subject Property:** The Subject Property is developed with several 1-story structures for coal, and hay and feed storage. Storage operations on the lot appear to be contiguous with those of the southern adjoining property. **Surrounding Area:** Surrounding properties include the J.F. Schmadeke Coal Yard with multiple structures and coal storage comprising the entire block to the north, the Gowanus Canal to the east, T.H. Lidford Coal and Wood Yard to the south with offices and a repair shop, and 3-story apartment dwellings to the west. A blacksmith, wagon builder, and wagon painting business are located at 306 Bond Street, located about 150 feet northwest of the Subject Property. The greater surrounding area is occupied by properties labeled masonry materials, lumber yards, wagon sheds, and coal yards.
1915	**Subject Property:** The Subject Property is labeled "John Hynes Granite Works", and contains a cutting shed and office. **Surrounding Area:** Adjoining and surrounding property usage appears to be generally consistent with the previous map.
1928	**Subject Property:** The map contains limited detail. The Subject Property occupies the northern portion of the Rubel Coal and Ice Corp.. **Surrounding Area:** The adjoining property to the north is labeled **Commonwealth Fuel Company**, the Gowanus Canal is to the east, and no details are available for properties to the west.
1938	**Subject Property:** The Subject Property consists of a one-story building on the northern half of the lot (current configuration) with a small shed on the southern portion of the lot. The property is labeled "**Thomas Paulson and Son, Inc. Brass Founders and Engineers (foundry)**". Coal bunkers and hoppers appear on the eastern side of the site, a scale is shown in the eastern area of the building, and **an underground gasoline tank** is present outside the southeast area of the building. **Surrounding Area:** The northern adjoining property is labeled **Magnet Fuel Corp**. with coal storage, the Gowanus Canal remains to the east, the southern adjoining property is labeled as vacant, and the western adjoining properties appear the same. Surrounding businesses include Koppers Seaboard Coke Company across the Gowanus Canal to the east, coal yards, a poultry market, and garages. There is a garage with two underground gasoline tanks about 300 feet southwest (cross-gradient) and a facility labeled Pure Oil Co. with several large capacity gasoline storage tanks about 475 feet south (cross-gradient) of the Subject Property.

SANBORN MAP SUMMARY	
YEAR	**COMMENTS**
1950	**Subject Property:** The Subject Property appears generally unchanged. **Surrounding Area:** The northern adjoining properties consist of a 4-story apartment building, and 1- and 2-story buildings labeled office and **private garage with two gasoline underground tanks at 487-501 Union Street**. **Supreme Oil Terminal Corp.** is located at 505-517 Union Street which contains five concrete encased fuel oil tanks covered in dirt. The tank capacities are as follows: one 500,000 gallon, one 400,000 gallon, one 300,000 gallon, one 200,000 gallon, and one 100,000 gallon. To the east of the Subject Property is the Gowanus canal, followed by the coke yard and warehouses. The southern adjoining property consists of two small buildings labeled **auto repair** and a large coal pile, and to the west of the Subject Property are apartments. Further north of the northern adjoining properties and within the same block are a **truck filling station, motor freight station, private garage, and auto repair,** which are all incorporated into the Supreme Oil Terminal Corp. facility and located within about 200 feet north of the Subject Property. There is a gasoline tank present at 497 Sackett Street and wooden box manufacturer further to the north. An iron works is located at 327 Bond Street, and a gasoline underground tank is present at a truck parking facility at 420 President Street, both about 175 feet south of the Subject property. The former blacksmith at 326 Bond Street is now labeled junk. The greater surrounding area consists of warehouses, auto repair facilities, and parking.
1969	**Subject Property:** The Subject Property appears generally unchanged. **Surrounding Area:** The northern adjoining property remains unchanged but is now labeled **Bayside Fuel Oil Corp**. The southern adjoining property contains an **auto wrecking and auto repair facility** with coal pile. An **auto repair shop** is now located at 326 Bond Street and a parking garage is located at 328 Bond Street. The usage of eastern and western adjoining and other surrounding properties appears generally unchanged.
1977, 1979, 1980, 1981, 1982, 1986, 1987, 1988, 1991, 1992, 1993, 1995, 1996, 2001-2007	**Subject Property:** The Subject Property appears generally unchanged. **Surrounding Area:** Surrounding property usage appears generally unchanged.

Langan's Sanborn Map review revealed that several one-story buildings have occupied the Subject Property since at least 1886. The property appeared to be part of a coal and wood storage yard that extended onto the southern adjoining property until about 1904. The Subject Property was labeled as a granite cutting works in 1915, and part of a coal and ice company in 1928. The Subject property was depicted in its current configuration and labeled a brass foundry by 1938. A gasoline UST is depicted at the eastern exterior portion of the Subject Property in all Sanborns between 1938 and 2007. Based on the potential for leaks or spills of petroleum products, solvents, and/or other hazardous materials associated with the presence

of a foundry and gasoline UST at the Subject Property between 1938 and 2007, historical site usage is considered a REC.

Surrounding properties have generally been occupied by commercial and manufacturing businesses since the late 19th century. The following historical uses of surrounding properties constitute RECs:

- Large-scale commercial fuel storage facility on the northern adjoining property at 505-517 Union Street (1928 – 2007);
- Private garage with two gasoline tanks on northern adjoining property at 487-501 Union Street (1950 - 2007);
- Automotive repair (1950 – 2007) and auto wrecking facility (1969 – 2007) on the southern adjoining property at 315 Bond Street; and
- Automotive repair (1969 – 2007) at 326 Bond Street approximately 50 feet southwest of the Subject Property.

4.6.3 Historical USGS Topographic Quadrangles

Langan reviewed historical USGS Topographic Quadrangles obtained from EDR for information regarding past uses of the Subject Property. Quadrangle maps were available for the Subject Property for the years 1900, 1924, 1947, 1956, 1967, 1979, and 1995. Based on a review of the historic topographic maps, the Subject Property was developed within a dense urban area and has adjoined the Gowanus Canal since as early as 1900. The historical topographic quadrangle did not reveal evidence of RECs. Copies of the topographic maps are provided in Appendix J.

4.6.4 City Directories

The City Directory Abstract, which is obtained from EDR, is a review of available business directories, including city, cross-reference, and telephone directories at approximately five-year intervals for the years spanning 1928 through 2013. Commercial and manufacturing businesses were listed at the Subject Property, and are generally categorized as follows:

- 1940 – 1949: Bronco Bronze Corporation and Thomas Paulson & Son, Inc. brass foundry.
- 1960-1973: Ernest Aron Metals and Thomas Paulson & Son, Inc. brass foundry.
- 2013: Model Barbers and 450 Union Incorporated.

Based on the potential for leakage or spillage of hazardous materials associated with metal working on the Subject Property, the historical foundry is considered a REC.

Multiple commercial and professional businesses were listed at surrounding properties. Herbys Scrap Metal was identified at the western adjoining property at 320 Bond Street in 1965 and 1970. Solomon & Sons Commercial Auto Bodies was identified at 303 Bond Street, located approximately 75 feet north of the Subject Property, in 1965, 1970, 1973, 1976, 1985, and 1992, and Paccione Ice Co was identified at the same location in 2008. Based on proximity to the Subject Property and the potential that undetected spills and leaks of chemicals associated with these operations adversely impacted soil and groundwater in the surrounding area, the scrap metal facility is considered a REC. A copy of the City Directory Abstract report is provided in Appendix K.

4.6.5 Environmental Lien Search

Langan contracted EDR to conduct an Environmental Lien search for the Subject Property. The result of the search, which included a compilation of available data and verification of the findings with the appropriate regulatory authorities, revealed that there are no Environmental Liens or other Activity and Use Limitations (AUL) associated with the Subject Property. A copy of the Environmental Lien Search is provided in Appendix L.

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

The site reconnaissance was conducted in a systematic manner focusing on the spatial extent of the Subject Property and then progressing to the adjacent and surrounding properties. The assessment of the adjacent and surrounding properties was limited to identifying, if possible, any indications of past or current use that may involve the use, storage, disposal, or generation of hazardous substances or petroleum products; noting the general type of current use; the general topography of the surrounding area; and providing a general description of adjoining or adjacent structures.

5.2 Date and Time of Inspection

The reconnaissance was performed at 9:30 am on April 11, 2014 by Luke McCartney of Langan. The weather at the time of the inspection was partly sunny and approximately 60°F. Mr. McCartney was not accompanied by representatives of the site operators during the inspection. With the exception of a central art gallery area and a storage closet within a storage shed on the northern portion of the property, Langan was granted access to the entirety of the Subject Property.

5.3 General Site Setting and Reconnaissance Observations

The Subject Property consists of one lot, which is improved with a 9,880 square-foot one-story, slab-on-grade commercial building and two storage sheds. The northern exterior portion of the property contains an enclosed area for social events, and a parking and driveway area occupy the remaining exterior portions of the parcel. A bulkhead consisting of a 12-foot high headwall supported by timber cribbing separates the property from the Gowanus Canal. Access to the Subject Property is via entrances on Bond and Union Streets.

The western portion of the former foundry building is occupied by a private event space that is accessible through a door along Union Street. The event space consists of a large open room, bathrooms, a waiting room, office space in a small loft near the western wall, a kitchen and food preparation area with overhanging storage lofts, and landscaped exterior space with a small storage shed for chairs and tables. Trench drains were noted near the doors to the event space, and a floor drain was observed within the exterior portion of the event space. Air-conditioning ventilation ducts were noted on the ceiling. The central portion of the building is occupied by an art gallery that is accessible via doors along the northern and southern part walls of the building. Although this area was not accessible during the inspection, the gallery was observed through large window panels. No floor drains were noted in the gallery area.

The eastern portion of the building and exterior lot is occupied by a commercial metal working shop, which includes a garage area utilized for equipment storage, a parking and driveway area, and a small storage shed. The eastern portion of the building is accessible through a garage door and doorway along the southern wall. Metal working operations include cutting and welding of metal beams and sheets. Small puddles of water were noted on the floor throughout the metal working area, indicating possible leaks in the roof. An open, circular floor drain and approximately 10 foot by 20 foot, steel plate-covered vault were observed in the metal working shop. The use of the vault was indeterminate, due to overlying metal beams that impeded access. Paint was observed to be flaking off the walls and ceiling in the garage area. The roof was inaccessible during the inspection.

Three solid waste containers, discarded wooden and metal construction debris, miscellaneous plastic containers and buckets, and filled garbage bags were observed on the southeastern portion of the Subject Property. Approximately 15 propane canisters were observed in the exterior storage area near the metal working shop.

Pits, Ponds, Lagoons

Langan did not observe pits, ponds, or lagoons on the Subject Property.

Pools of Liquid

Small pools of water were observed throughout the eastern metal working area. The pools are indicative of possible leaks in the roof.

Storm Drains, Wells, and Cisterns

Storm drains, wells, and cisterns were not observed at the Subject Property.

PCB Transformers and Suspect Equipment

Transformers and other suspect polychlorinated biphenyl (PCB)-containing equipment were not observed at the Subject Property.

Storage Containers, Drums, and Chemical Storage Areas

Three solid waste containers, discarded wooden and metal construction debris, miscellaneous plastic containers and buckets, and filled garbage bags were observed on the southeastern portion of the Subject Property. Approximately 15 propane canisters were observed in the exterior storage area near the metal working shop. Paint storage was observed in the loft above the kitchen/food preparation area that adjoins the event space in the western portion of the

building. A five-gallon container of the carbon and pollution remover, Sure Klean Restoration Cleaner, was stored in the eastern garage area.

Sumps

Collection sumps were observed within the garage area and east of the building in the driveway.

USTs or ASTs

Evidence of ASTs or USTs was not observed at the Subject Property. A metal sheeting and steel beam storage area occupies the suspected location of the historical UST (based on Sanborn maps and AKRF's 2002 investigation). The underlying pavement could therefore not be observed for indications of a tank.

Monitoring Wells or Remedial Activities

Monitoring wells were not observed at the Subject Property.

Stained or Discolored Soil

Stained or discolored soil was not observed at the Subject Property.

Leachate or Seeps

Leachate or seeps were not observed at the Subject Property.

Adjoining and Surrounding Property Uses

The Subject Property is adjoined to the north across Union Street by a multiple-story apartment building, a single-story two-bay garage, a one-story commercial building, and a petroleum storage facility; to the east by the Gowanus Canal; to the south by a bus and automobile parking lot; and to the west across Bond Street by multiple-story residential apartments. The greater surrounding area is primarily comprised of multiple-story commercial and industrial facilities along the Gowanus Canal, and commercial and residential buildings west of Bond Street.

Site Reconnaissance Conclusions

An approximately 10-ft by 20-ft plate-covered, underground vault in the metal working area was potentially historically used to store hazardous materials. The interior of the vault was inaccessible during the site reconnaissance. Based on the potential for impacts associated with the former use of the vault, the structure is considered a REC.

6.0 INTERVIEWS

6.1 Site Owner

The site owner was present during portions of the site reconnaissance. Information provided by the site owner is incorporated into Section 5.0.

6.2 Site Occupants

Site occupants were not interviewed as part of this Phase I ESA.

6.3 Owners/Tenants of Adjacent Properties

Owners/tenants of adjacent properties were not interviewed as part of this Phase I ESA.

7.0 ADDITIONAL SERVICES

7.1 Radon

Radon is a colorless, odorless radioactive gas that results from the natural breakdown of uranium minerals in soil, rock, and water, which subsequently enters the atmosphere. It can concentrate in buildings, entering through cracks and other penetrations of a building foundation. Some areas are more likely to have elevated concentrations of radon than others, reflecting subsurface lithologic conditions.

According to the United States Environmental Protection Agency (USEPA) Radon Zone Map, the Subject Property is located in Zone 3, which indicates a predicted average indoor radon screening level less than 4 pico Curies per Liter (pCi/L). The New York State Department of Health (NYSDOH) maintains a database of radon test results on a local and county level. According to the NYSDOH, 427 radon tests have been conducted in Kings County with results for 9.4% of residential basements and 1.4 % of living areas above 4.0 pCi/L. In addition, the USEPA National Radon Database indicates that of 51 tested sites in Kings County, 100% of living areas and 88% of basements contained radon at concentrations below 4.0 pCi/L. Based on this information, it is unlikely that elevated levels of radon gas are present at the Subject Property.

7.2 ACM, LBP, and PCBs

A formal survey to identify asbestos-containing material (ACM), lead-based paint (LBP) and/or PCB-containing material was not conducted as part of this Phase I ESA. Based on the age of the buildings, ACM, LBP, and PCB-containing materials may be present in building materials, including floor tiles and insulation (ACM) and fluorescent light ballasts and caulking (PCBs).

8.0 DEVIATIONS AND DATA GAPS

8.1 Deviations

Langan performed a Phase I ESA of the Subject Property utilizing a standard of good commercial and customary practice that is consistent with the ASTM E1527-13 and the 40 CFR Part 312 Standards and Practices for AAI. Significant deviations were not made to the above referenced standards.

8.2 Data Gaps

In order to address data gaps, additional sources of information may be consulted. According to AAI, Section 312.20 (g), "to the extent there are data gaps (as defined in section 312.10) in the information developed… that affect the ability of persons (including the environmental professional) conducting the all appropriate inquiries to identify conditions indicative of releases or threatened releases...such persons should identify such data gaps, identify the sources of information consulted to address such data gaps, and comment upon the significance of such data gaps." According to ASTM E 1527-13, Section 8.3.2.3, "historical research is complete when either: (1) the objectives in 8.3.1 through 8.3.2.2 are achieved; or (2) data failure is encountered. Data failure occurs when all standard historical sources that are reasonably ascertainable and likely to be useful have been reviewed and yet the objectives have not been met. If data failure is encountered, the report shall document the failure and, if any of the standard historical sources were excluded, give the reasons for the exclusion."

Data gaps included the inaccessibility of an underground vault in the metal working area, the art gallery and a storage unit within a shed associated with the event space. Due to the absence of information pertaining to the contents or historical use of the vault, the structure is considered a REC. The data gaps are not expected to significantly alter the results of the Phase I ESA. If information becomes available that alters the conclusions of this Phase I, an addendum will be issued.

9.0 FINDINGS, OPINIONS, AND CONCLUSIONS

This Phase I ESA was conducted in accordance with the ASTM Practice E1527-13 (Standard Practice for ESA: Phase I ESA Process) and the USEPA AAI Rule. The objective of this Phase I ESA was to identify the presence or likely presence, use, or release on the Subject Property of hazardous substances or petroleum products as defined in ASTM E1527-13 as a REC. The Phase I ESA identified the following RECs associated with the Subject Property:

REC 1 – Petroleum-Contaminated Soil

A Phase II ESI conducted in 2002 revealed that sub-surface soil on the eastern portion of the Subject Property contained SVOCs at concentrations above the NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives and indicative of a potential petroleum spill.

REC 2 – Underground Vault

An approximately 10-ft by 20-ft, steel plate-covered, underground vault is located in the metal working area in the eastern portion of the site building. The interior of the vault was inaccessible during the site reconnaissance. The vault may have been historically used for the storage of hazardous materials.

REC 3 – Historical Site Usage and Abandoned Gasoline Tank

Historical use of the Subject Property included a garage (1918 – 1930), foundry (1930 - 2007), and fuel company (1931), which may have resulted in unreported leaks or spills of petroleum, solvents, and other hazardous substances. The foundry was also listed as Large Quantity Generator of hazardous waste in 1984. In addition, an inactive gasoline UST registered under NYSDEC PBS No. 2-611519 was located on the eastern exterior portion of the Subject Property between at least 1938 and 2007. The location of the tank was confirmed by geophysical methods during a 2002 Phase II ESI. Potential unreported leaks or spills may be associated with the UST.

REC 4 –Current and Historical Surrounding Property Use

The following current and historical uses of surrounding properties may have adversely impacted soil, groundwater, and soil vapor at the Subject Property:

- Large-scale commercial fuel storage facility (Bayside Fuel Oil Depot Corp.) on the northern adjoining property at 505-517 Union Street (1928 – present).
- Private garage with two gasoline tanks on northern adjoining property at 487-501 Union Street (1950 - 2007).

- Automotive repair (1950 – 2007) and auto wrecking facility (1969 – 2007) on the southern adjoining property at 315 Bond Street. The wrecking facility was also listed as a CERCLIS NFRAP site and Conditionally Exempt Small Quantity Generator of hazardous waste in 1998.
- Scrap metal facility (1965 – 1970) on the western adjoining property at 320 Bond Street.
- Automotive repair (1969 – 2007) at 326 Bond Street approximately 50 feet southwest of the Subject Property.
- Electroplating operation (Regency Service Carts) located 390 feet southwest and up-gradient of the Subject Property at 337-361 Carroll street. The facility was listed as a generator of hazardous waste in 1996 and 2006.

REC 5 – Spills on Surrounding Properties

The following spills on nearby sites may have adversely impacted soil, groundwater, and/or soil vapor on the Subject Property:

- Petroleum spill (NYSDEC Spill No. 0902825) resulting in dissolved-phase groundwater and free-phase petroleum product contamination on the northern adjoining Bayside Fuel Oil Depot Corp. property.
- Petroleum-contaminated soil (NYSDEC Spill No. 0706319) near the western approach to the Union Street Bridge, which adjoins the Subject Property to the north.
- Petroleum spill (NYSDEC Spill No. 0102612) resulting in contaminated soil on the western adjoining property at 316 Bond Street.
- Federal CERCLIS NPL (i.e., Superfund) site consisting of the Gowanus Canal, which adjoins the Subject Property to the east.

Non-ASTM Environmental Concerns and De Minimis Conditions

- Multiple sumps and floor drains at the Subject Property represent potential pathways for contaminants to migrate from surface runoff into sub-surface soil.
- Based on the age of the site building, building materials may contain asbestos-containing material, lead-based paint, or PCBs.
- The current FEMA Advisory Base Flood Elevation Maps include new advisory flood zone boundaries and advisory base flood elevations. This map indicates that the site falls within the advisory limit of the 0.2% Annual Chance Flood Hazard Area.

No controlled or historical RECs (CRECs or HRECs) were identified.

10.0 REFERENCES

The following references were reviewed as part of this Phase I ESA:

1. Environmental Data Resources, Inc. April 9, 2014. Aerial Photo Decade Package.
2. Environmental Data Resources, Inc. April 9, 2014. City Directory Abstract.
3. Environmental Data Resources, Inc. April 10, 2014. Environmental Lien Search.
4. Environmental Data Resources, Inc. April 9, 2014. Historical Topographic Map Report.
5. Environmental Data Resources, Inc. April 8, 2014. Radius Map with GeoCheck.
6. Environmental Data Resources, Inc. April 9, 2014. Sanborn Map Report.
7. Environmental Data Resources, Inc. April 8, 2014. Building Permit Report.
8. Environmental Data Resources, Inc. April 8, 2014. Property Tax Map Report.
9. Environmental Protection Agency, USEPA Map of Radon Zones
10. New York City Department of Buildings, Building Information System, http://www.nyc.gov/html/dob/html/bis/bis.shtml, retrieved April 15, 2014.
11. New York City Planning Commission. Zoning Map 16c.
12. City Online Register, http://www.nyc.gov/html/dof/html/jump/acris.shtml, retrieved April 15, 2014.
13. NYCityMap, http://gis.nyc.gov/doitt/nycitymap/

11.0 STATEMENT OF QUALIFICATIONS AND SIGNATURES

Langan declares that, to the best of its professional knowledge and belief, the personnel who performed this Phase I ESA meet the definition of Environmental Professional as defined in Subsection 312 10 of 40 CFR 312 and that they have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. They have developed and performed the AAIs in conformance with the standards and practices set forth in 40 CFR Part 312. Resumes outlining the qualifications of the Environmental Professionals who performed this Phase I ESA are provided in Appendix M.

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

DRAFT

Michael Burke, CHMM, LEED AP
Senior Associate

APPENDIX B

GEOPHYSICAL ENGINEERING SURVEY REPORT

COMMERCIAL PROPERTY
450 UNION STREET
BROOKLYN, NEW YORK 11231

NOVA PROJECT NUMBER
14-0273

DATED
MAY 13, 2014

PREPARED FOR:
LANGAN
21 Penn Plaza –
360 West 31st Street
New York, NY 10001

PREPARED BY:

NOVA
GEOPHYSICAL
ENGINEERING
Subsurface Mapping Solutions
56-01 Marathon Parkway # 765
Douglaston, New York 11362
347-556-7787 (PHONE)
718-261-1527(FAX)
www.nova-gsi.com

NOVA GEOPHYSICAL SERVICES

SUBSURFACE MAPPING SOLUTIONS
56-01 Marathon Parkway, # 765, Douglaston, New York 11362
Ph. 347-556-7787 Fax. 718-261-1527
www.nova-gsi.com

March 13, 2014

Stuart Knoop, P.G.
Senior Project Manager
LANGAN
21 Penn Plaza –
360 West 31st Street
New York, NY 10001
Direct: 212.479.5461
Mobile: 917.941.2831

Re: Geophysical Engineering Survey (GES) Report
Commercial Property
450 Union Street
Brooklyn, New York 11231

Dear Mr. Knoop:

Nova Geophysical Services (NOVA) is pleased to provide findings of the geophysical engineering survey (GES) at the above referenced project site: 450 Union Street, Brooklyn, New York (the "Site"). Please see attached Site Location and Geophysical Survey maps for more details.

INTRODUCTION TO GEOPHYSICAL ENGINEERING SURVEY (GES)

NOVA performed a Geophysical engineering surveys (GES) consisting of Ground Penetrating Radar (GPR) and Electromagnetic (EM) surveys at the project Site. The purpose of this survey is to locate and identify anomalies, utilities and other substructures and to clear and mark proposed environmental boring areas on May 6th, 2014.

The equipment selected for this investigation was an Electromagnetic Utility Detector (EUD-3) and Noggin's 250 MHz ground penetrating radar (GPR) shielded antenna.

A GPR system consists of a radar control unit, control cable and a transducer (antenna). The control unit transmits a trigger pulse at a normal repetition rate of 250 MHz. The trigger pulse is sent to the transmitter electronics in the transducer via the control cable. The transmitter electronics amplify the trigger pulses into bipolar pulses that are radiated to the surface. The transformed pulses vary in shape and frequency according to the transducer used. In the subsurface, variations of the signal occur at boundaries where there is a dielectric contrast (void, steel, soil type, etc.). Signal reflections travel back to the control unit and are represented as color graphic images for interpolation.

GEOPHYSICAL METHODS

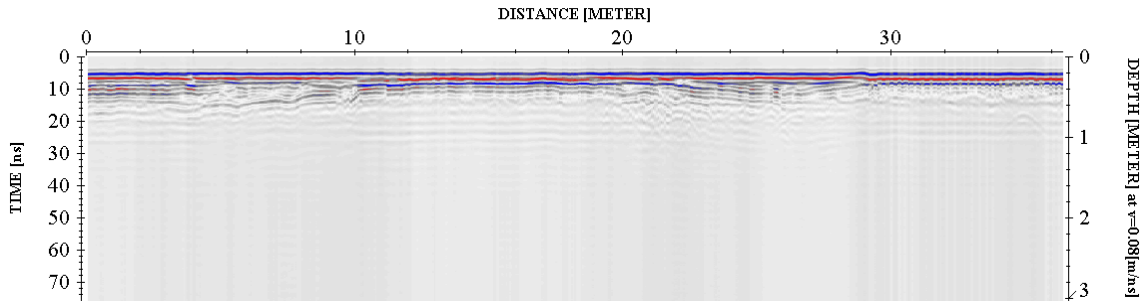
The project site was first screened using the Geonics(tm) electromagnetic detector by carrying the instrument over the project area at the site in 1' x 1' traverses. Finally, GPR profiles were collected over each anomaly and inspected for reflections, which could be indicative of major anomalies and substructures. Nova performed full scale multi-frequency GPR surveys for the targeted depths of approximately 3 to 10 feet below ground surface (bgs) pending quality of the data and sediments settings.

GPR data profiles were collected for the areas of the Site specified by the client. The surveyed areas consisted of paved & unpaved areas.

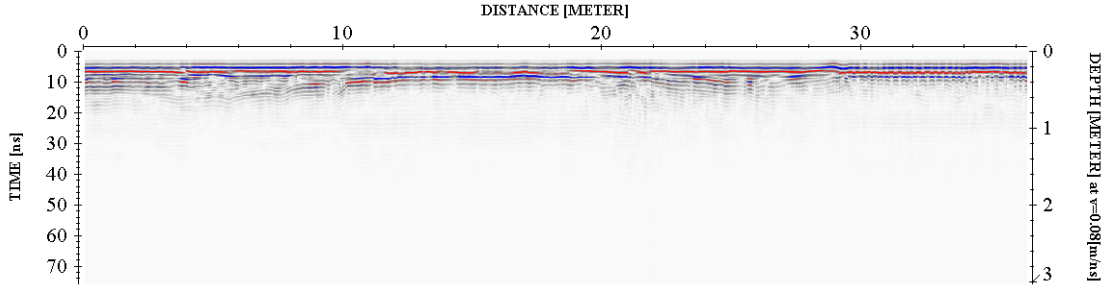
DATA PROCESSING

In order to improve the quality of the results and to better identify subsurface anomalies NOVA processed the collected data. The processes flow is briefly described at this section.

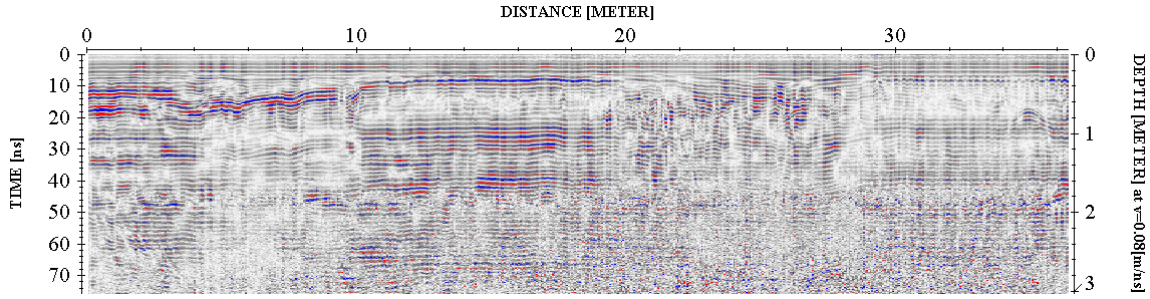
Step 1. Import raw RAMAC data to standard processing format



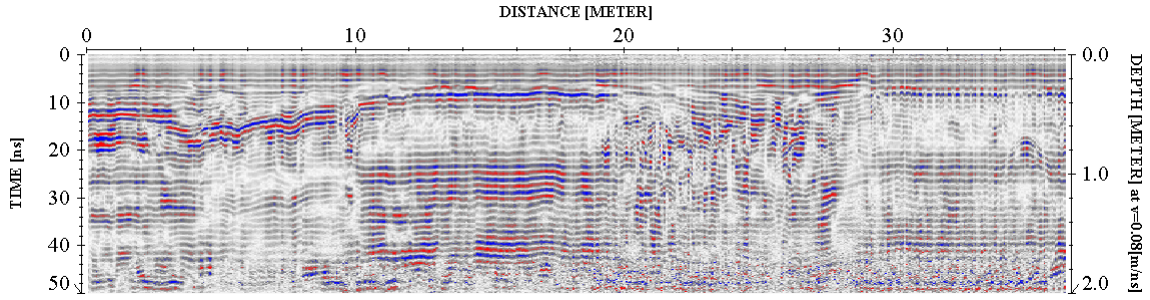
Step 2. Remove instrument noise *(dewow)*



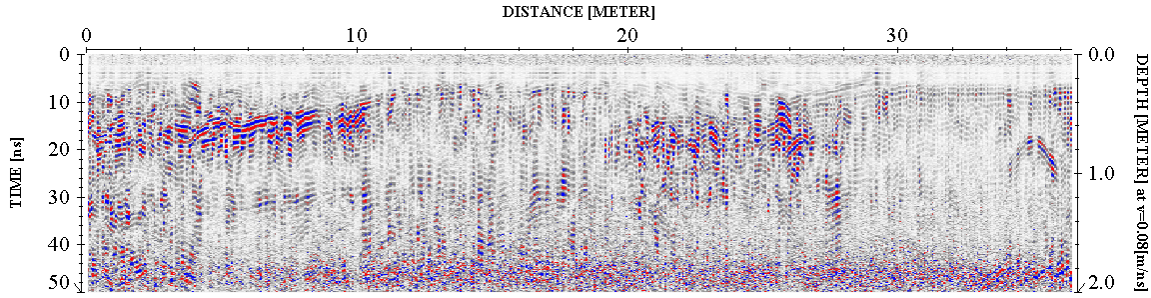
Step 3. Correct for attenuation losses *(energy decay function)*



Step 4. Remove static from bottom of profile *(time cut)*



Step 5. Mute horizontal ringing/noise *(subtracting average)*



The above example shows the significance of data processing. The last image (step 5) has higher resolution than the starting image (raw data – step 1) and describes the subsurface anomalies more accurately.

PHYSICAL SETTINGS

Nova observed following physical conditions at the time of the survey:

The weather: Mostly Cloudy.

Temp: 67 Degrees (F).

Surface: Paved (walkway-asphalt) none paved.

Geophysical Noise Level (GNL): Geophysical Noise Level (GNL) was medium to **high** at the time of the survey due to on-site business activities and on-site storage of metal containing materials, and etc. at the time of the survey.

RESULTS

The results of the geophysical engineering survey (GES) identified following at the project Site:

- GES identified anomalies located throughout of the project area. Based on their reflection rates, these anomalies were consistent with utilities (telephone, gas, electric, sewer line, and water line) and were located approximately 1 feet below ground surface (bgs) to 4 feet below ground surface facing Bond Street and Union Street.
- All anomalies including identified utilities were clearly marked during the field survey.
- Due to excessive geophysical noise identified during the survey, Nova could not verify the existing of underground storage tank (UST) at the project site.
- Nova cleared and marked all of the proposed boring locations at the time of the survey.
- Geophysical Survey Plan portrays the areas investigated during the geophysical survey.

If you have any questions please do not hesitate to contact the undersigned.
Sincerely,

NOVA Geophysical Services

Levent Eskicakit, P.G., E.P.
Project Engineer

Attachments:
Figure 1 Site Location Map
Geophysical Survey Plan
Geophysical Images

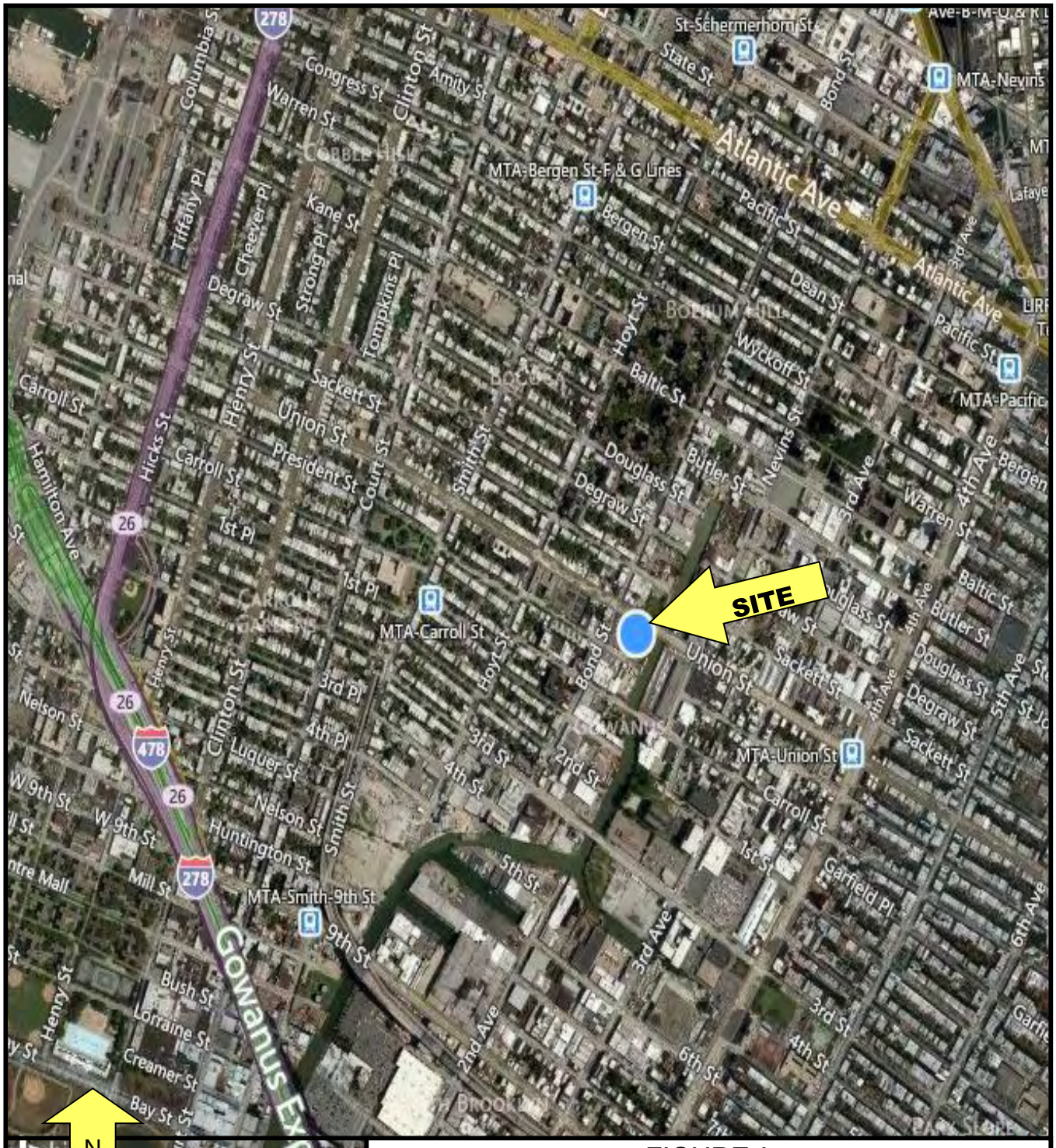


FIGURE 1

SITE LOCATION MAP

NOVA

Geophysical Services

Subsurface Mapping Solutions

56-01 Marathon Pkwy, # 765, Douglaston, NY11362

(347) 556-7787 Fax (718) 261-1528

www.nova-gsi.com

SITE: **Commercial Property**
450 Union Street
Brooklyn, New York 11231

SCALE: See Map

UNION STREET

BOND STREET

CANAL

GOWANUS

N

EVENTS SPACE / GALLERY

METAL SHOP

#450 UNION STREET

ONE STORY BRICK

ONE STORY FRAME

ONE STORY BLOCK (GARAGE)

Y A R D

(ROOF OVER)

(ASPHALT)

SB/MW-9

SB-8

SB/MW-7

SV-2

SB/MW-6

SB-2

SB/MW-3

SV-3

SB/MW-4

SB/MW-5

SB/MW-1

SV-1

300'

100'

80'

75'

225'

20'

BULKHEAD CL TO THE WEST

HIGH CORRUGATED FENCE

CHAIN LINK FENCE

24" LOW CONC. WALL

LEGEND

- SB-2 — SOIL BORING LOCATION
- SB/MW-1 — SOIL BORING / MONITORING WELL LOCATION
- SV-1 — SOIL VAPOR SAMPLE LOCATION
- PROPERTY BOUNDARY

Note: All anomalies were marked in the field.

Proposed Boring Areas

NOVA
Geophysical Services
Subsurface Mapping Solutions
56-01 Marathon Parkway, # 765
Douglaston, New York11362
Phone (347) 556-7787 * Email info@nova-gsi.com
www.nova-gsi.com

GEOPHYSICAL SURVEY

SITE : **Commercial Property**
450 Union Street, Brooklyn New York 11231
CLIENT: Langan Engineering & Environmental Services
DATE: May 6, 2014
Scale See Map

INFORMATION

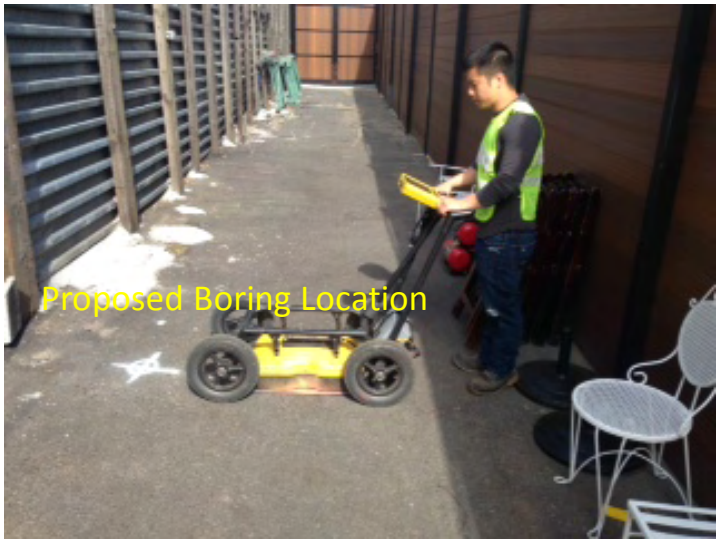
- Project Area
- No GPR/EM Performed
- Scattered Anomalies
- Underground Utilities/Pipes
- Geophysical Noise Areas
- Storm Drains (Observed)

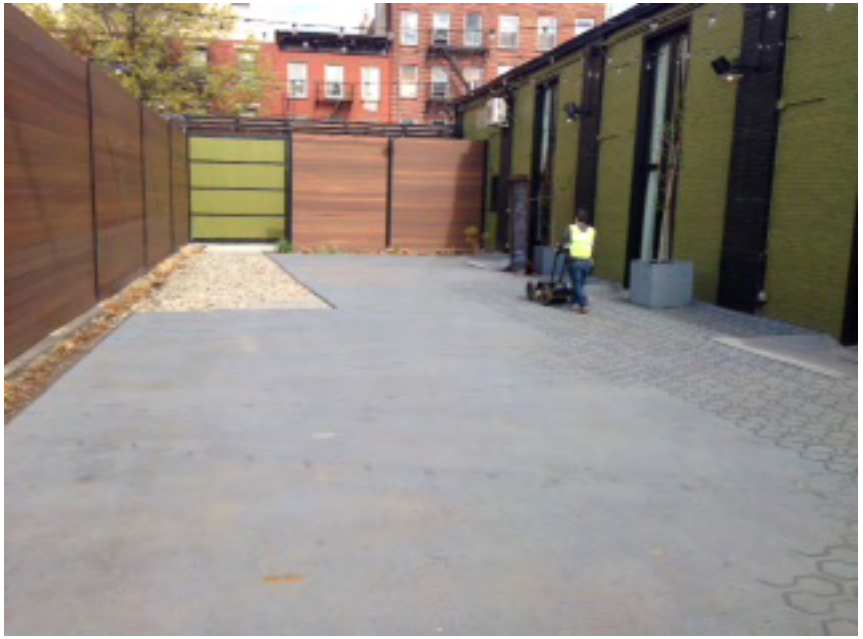
GEOPHYSICAL IMAGES

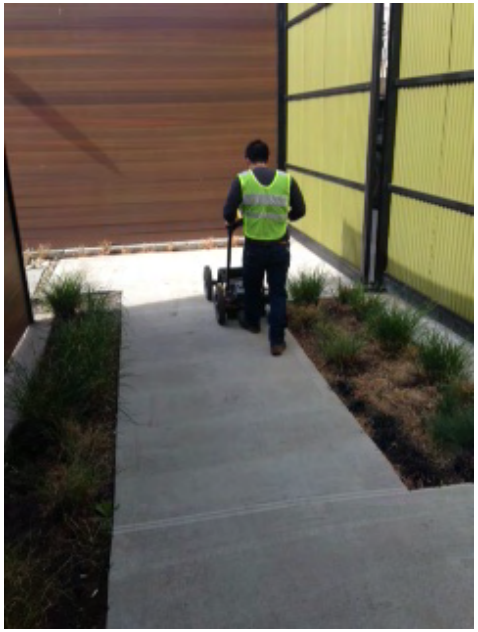
Commercial Property

450 Union Street, Brooklyn, New York

May 6, 2014

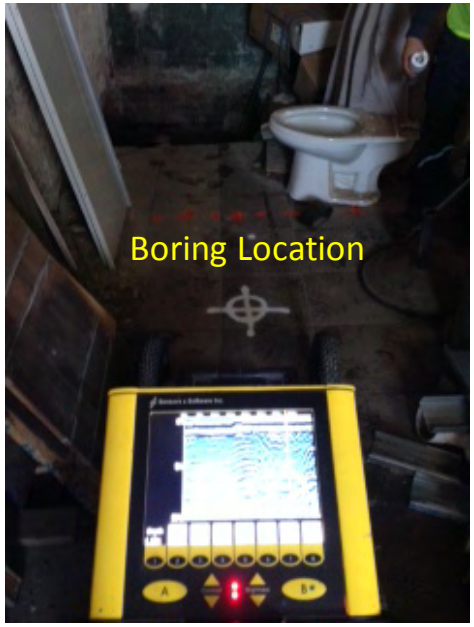


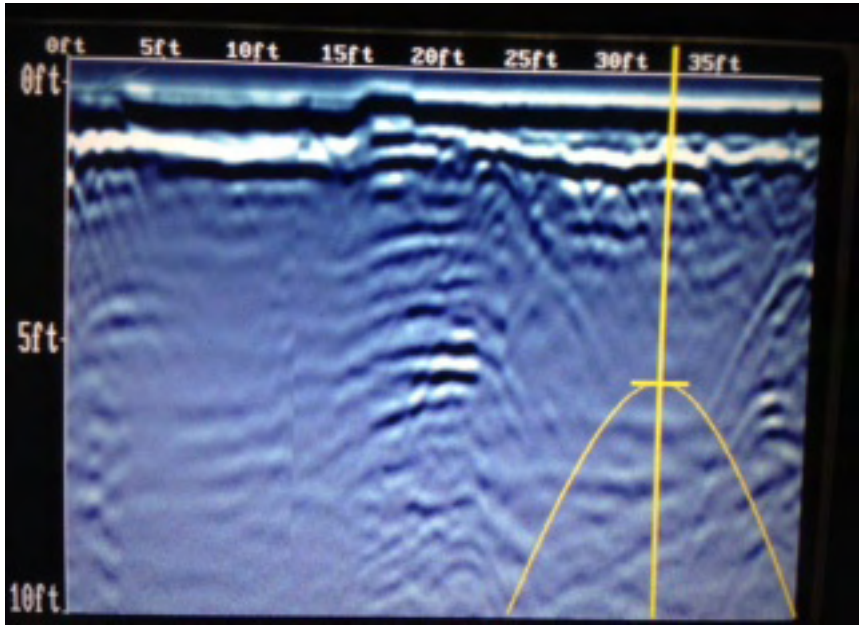




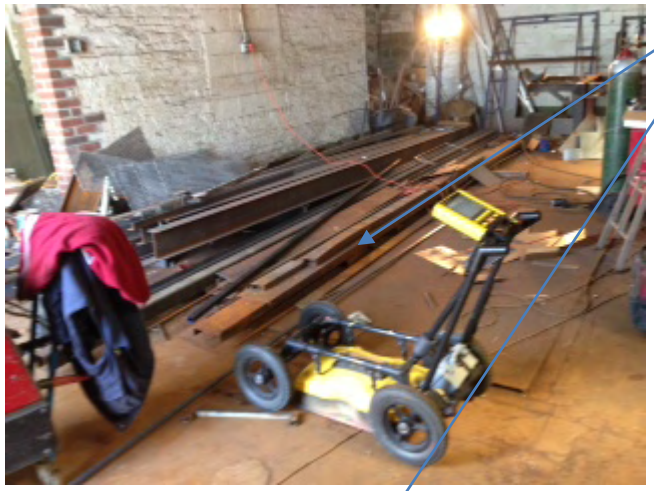
GEOPHYSICAL IMAGES

Commercial Property
450 Union Street, Brooklyn, New York
May 6, 2014





Geophysical Noise Areas



APPENDIX C

LANGAN

Log of Boring **SB/MW-1** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/8/14 — Date Finished: 5/8/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First ▽ 8 — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			3" ASPHALT	0					0.0	
		Class 7	Dark brown and brown silty SAND, some gravel, trace coal, brick and wood (moist) [FILL]	1					0.0	SB01_1'-1.5' 12:30
				2					0.0	
				3	S-1	MACROCORE	28		0.0	
				4						
				5						
				6						
				7					0.0	
				8 ▽	S-2	MACROCORE	36		0.0	SB01_8'-8.5' 13:55
				9					0.0	
				10					0.0	
		Class 7	Brown silty SAND, trace gravel (wet) [FILL]	11						
				12	S-3	MACROCORE	29			
				13					0.0	
				14					0.0	
				15					0.0	Temporary monitoring well installed Screened 5'-15', 1" diameter
			End of boring at 15'	16						
				17						
				18						
				19						
				20						

LANGAN

Log of Boring **SB/MW-3** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/7/14 — Date Finished: 5/7/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First - — Completion - — 24 HR. -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Number	Sample Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
		Class 3b	3" ASPHALT	0						SB03_0'-0.5' 11:00
		Class 3b	Brown SILT, some coarse sand and gravel, trace concrete, brick [FILL]	1					2.3	
			COAL and coal ash [FILL]						1.8	
		Class 3b	Brown SILT, trace wood, brick (dry) [FILL]	2	S-1	MACROCORE	27		2.2	
				3					1.8	
				4						
			BOULDER fragments	5					1.7	
		Class 3b	Brown coarse SAND and some gravel (moist) [FILL]	6					1.8	
		Class 4c	Dark gray CLAY and some coal (wet) [FILL]	7	S-2	MACROCORE	33		1.8	
				8					1.7	SB03_7'-7.5' 11:20
				9					16.4	
		Class 4c	Dark gray CLAY, some beige and red coarse sand (wet) [FILL]	10					2.2	
		Class 3b	Brown coarse SAND and some gravel (moist) [FILL]	11					1.3	
			Gray coarse SAND and some gravel (moist) [FILL]	12	S-3	MACROCORE	33		1.2	
		Class 4c	Dark gray CLAY with coal (moist) [FILL]	13					1.0	
		Class 3b	Brown SAND and some gravel (moist) [FILL]	14					0.8	
			End of boring at 15'	15						Temporary monitoring well installed Screened 5'-15', 1" diameter
				16						
				17						
				18						
				19						
				20						

LANGAN

Log of Boring **SB/MW-4** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/7/14 — Date Finished: 5/7/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First ▽ 8.4 — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			SOIL AND VEGETATION	0					0.0	
		Class 3b	Brown medium SAND, some gravel (dry) Dark brown f-m SAND, trace coal (dry)	1					0.8	
				2	S-1	MACROCORE	48		1.2 0.7	SB04_1.5'-2' 11:50
			Dark gray GRAVEL (dry) Brown f-m SAND, trace fragments						0.9	
			CONCRETE	3					1.0	
		Class 3b	Brown fine SAND with some gravel (dry)						1.0	
		Class 6	Dark gray SILT with some green staining	4						
				5						
				6						
				7	S-2	MACROCORE	30		0.2	
			Brown m-c SAND, some brick, gravel	8					0.5	SB04_8'-9' 12:10
			Tan m-c SAND, some gravel (wet)						0.6	
			Dark gray coarse SAND with some gravel, silt, trace wood [FILL]	9					0.6	
				10					0.4	
		Class 3b		11						
				12	S-3	MACROCORE	22			
				13					0.1	
			Brown GRAVEL (wet) [FILL]	14					0.1	
			Gray silty SAND, some gravel (wet)						0.1	
		Class 6	Dark gray SILT with some gravel (wet)	15						Temporary monitoring well installed Screened 5'-15', 1" diameter
			End of boring at 15'	16						
				17						
				18						
				19						
				20						

LANGAN

Log of Boring **SB/MW-5** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/7/14 — Date Finished: 5/7/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First - — Completion - — 24 HR. -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Brown silty SAND (dry)	0					0.0	
			Brown c-m-f SAND, some gravel (dry)	1					0.0	
			Dark brown silty SAND, some wood						0.0	SB05_1.5'-2' 14:20
			Tan coarse SAND, some wood and gravel [FILL]	2	S-1	MACROCORE	24		0.0	
			Dark gray CLAY with coal, gravel (moist) [FILL]	3					0.0	
			Brown fine SAND with some gravel, brick, trace coal (dry) [FILL]	4						
				5						
				6						
				7	S-2	MACROCORE	36		0.0	
			CONCRETE fragments	8					0.0	
									0.0	SB05_8.5'-9' 14:30
				9					0.0	
			Brown silty SAND, some gravel, wood, trace green staining [FILL]	10					0.0	
				11						
				12					0.0	
			Dark brown coarse SAND, some gravel (wet) [FILL]		S-3	MACROCORE	34		0.0	
			Brown coarse SAND with gravel (wet)	13					0.0	
									0.0	
			Dark gray CLAY, trace wood (wet) [FILL]	14					0.0	
									0.0	
			Dark brown SAND, trace brick, gravel (wet) [FILL]	15					0.0	
			End of boring at 15'							Temporary monitoring well installed Screened 5'-15', 1" diameter
				16						
				17						
				18						
				19						
				20						

LANGAN

Log of Boring **SB/MW-6** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/7/14 — Date Finished: 5/7/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First - — Completion - — 24 HR. -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			CONCRETE	0					0.0	
				1					0.0	SB06_1'-1.5' 12:55
				2					0.0	
			Brown and tan m-f SAND, some silt, trace coal, brick, gravel [FILL]	3	S-1	MACROCORE	30		0.0	
				4					0.0	
				5						
				6						
				7	S-2	MACROCORE	36		0.0	
				8					0.0	SB06_8'-9' 13:10
			Orange coarse SAND, some gravel [FILL]	9					0.0	
			Tan SAND, trace coal, brick [FILL]	10					0.0	
				11					0.0	
				12	S-3	MACROCORE	24		0.0	
			Dark gray CLAY, trace wood (wet)	13					0.0	
			Brown coarse SAND, some clay (wet)	14					0.0	
			Dark gray CLAY, trace wood (wet)	15					0.0	
			End of boring at 15'	16						Temporary monitoring well installed Screened 5'-15', 1" diameter
				17						
				18						
				19						
				20						

LANGAN

Log of Boring **SB/MW-7** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/8/14 — Date Finished: 5/8/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First ▽ 8.5 — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			6" CONCRETE	0						SB07_0.5'-1' 11:45
			Brown and tan f-m SAND with silt, some brick, gravel, coal, trace rust staining (moist) [FILL]	1	S-1	MACROCORE	24		0.0	
				2					0.0	
				3					0.0	
				4					0.0	
				5	S-2	MACROCORE	42			
				6					0.0	
				7					0.0	SB07_7'-7.5' 11:55
			▽	8					0.0	
				9					0.0	
			Dark gray SILT, some wood, some coal (wet) [FILL]	10					0.0	
				11	S-3	MACROCORE	24			
				12					0.0	
				13					0.0	
				14					0.0	
			Brown fine SAND with silt (wet) [FILL]	15					0.0	Temporary monitoring well installed
			End of boring at 15'	16					0.0	Screened 5'-15', 1" diameter
				17						
				18						
				19						
				20						

LANGAN

Log of Boring **SB/MW-9** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/8/14 — Date Finished: 5/8/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First ▽ 9 — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			6" CONCRETE	0					0.0	
			Brown fine SAND, some gravel, coal (moist) [FILL]	1					0.0	
			CONCRETE fragment							
			Dark brown fine SAND, some gravel (moist) [FILL]	2					0.0	SB09_1.5'-2' 14:38
					S-1	MACROCORE	26		0.0	
			Tan medium SAND, some silt, gravel, trace coal, trace rust staining (moist) [FILL]	3					0.0	
				4					0.0	
				5					0.0	
				6					0.0	
				7	S-2	MACROCORE	43		0.0	
				8					0.0	SB09_ 8'-8.5' 14:50
			▽	9					0.0	
				10					0.0	
			Brown silty SAND, some f-m gravel (wet) [FILL]	11					0.0	
				12	S-3	MACROCORE	14		0.0	
				13					0.0	
				14					0.0	
				15					0.0	Temporary monitoring well installed
			End of boring at 15'	16						Screened 5'-15', 1" diameter
				17						
				18						
				19						
				20						

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LANGAN

Log of Boring **SB-2** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/7/14 — Date Finished: 5/7/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 15 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 3 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First ▽ 9 — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			2" ASPHALT	0					1.7	SB02_0.5'-1' 14:50
			Brown silty SAND, some gravel (dry) [FILL]	1					0.5	
				2					0.2	
			Dark brown m-c SAND, some gravel (dry) [FILL]	3	S-1	MACROCORE	31		0.2	
				4					0.0	
				5						
				6						
			CONCRETE FRAGMENTS	7	S-2	MACROCORE	36		0.0	
				8					0.0	
			Dark brown to brown coarse SAND, trace brick (moist) [FILL] ▽	9					0.0	SB02_8'-8.5' 15:30
				10					0.0	
			Tan coarse SAND, some gravel and silt (wet) [FILL]	11	S-3	MACROCORE	60		0.0	
				12					0.0	
			Brown SILT, some gravel (wet) [FILL]	13					0.0	
				14					0.0	
			End of boring at 15'	15					0.0	
				16						
				17						
				18						
				19						
				20						

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LANGAN

Log of Boring **SB-8** Sheet 1 of 1

Project: 450 Union Street	Project No.: 170301201
Location: Brooklyn, N.Y.	Elevation and Datum: NA
Drilling Company: Aquifer Drilling and Testing, Inc.	Date Started: 5/8/14 — Date Finished: 5/8/14
Drilling Equipment: Geoprobe 6620 DT	Completion Depth: 5.5 ft — Rock Depth: -
Size and Type of Bit: 5' Macrocore (2" I.D.)	Number of Samples: Disturbed 1 — Undisturbed - — Core -
Casing Diameter (in): NA — Casing Depth (ft): NA	Water Level (ft.): First - — Completion - — 24 HR. -
Casing Hammer: NA — Weight (lbs): NA — Drop (in): NA	Drilling Foreman: Chris Iodice
Sampler: Acetate Liner In Macrocore Sampler	Inspecting Engineer: Melissa Ng
Sampler Hammer: NA — Weight (lbs): NA — Drop (in): NA	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			5" CONCRETE	0					0.0	
			Dark gray f-m SAND, some fine gravel (dry) [FILL]	1					0.0	SB-8_1'-2' 16:40
			CONCRETE fragments						0.0	
			Brown f-m SAND, some brick, coal (dry)	2	S-1	MACROCORE	24		0.0	
			Beige coarse SAND and gravel (dry) [FILL]	3						
			Brown f-m SAND, some brick, coal, stone (dry)	4						
			Tan m-c SAND with gravel (dry) [FILL]	5						
			End of boring at 5.5'	6						Refusal at 5.5'
				7						
				8						
				9						
				10						
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						
				20						

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APPENDIX D

GROUND WATER SAMPLE FIELD INFORMATION FORM

Site: LSD UNIONST	Well#/Location: SB/MW-9	Job No. 17030201
Date: 5/13/14	Weather: SUNNY, 60s	Sampling Personnel: MN

Well Information

Sample ID	MW09_051314
Well Depth (ft)	15
Screened Interval (ft)	5-15
Casing Elevation (msl)	-
Casing Diameter (in)	1
Depth to Water (ft)	7.72 @ 900
Water Elevation (msl)	-
Casing Volume (gal)	-
PID/FID Reading (ppm)	0.0

Purging Information

Purging Method	LF, PP
Purging Rate (l/m; gpm)	~180 mL/min
Start Purge Time	905
End Purge Time	1005
Volume Purged (gal)	2.5

Sampling Information

Sampling Method	LF, PP
Start Sampling Time	1006
End Sampling Time	1030
Depth Before Sampling (ft)	-
Number Bottles Collected	11

	±0.1SU	±3%	±10%	±10% Parameters	±3%	±10mV	<3Ft	
Sample Time	**pH**	**Conductivity (mS/cm)**	**Turbidity (NTU)**	**Dissolved Oxygen (mg/L)**	**Temp (°C)**	**ORP (mV)**	**Depth to Water (ft)**	**Purged Volume (gallons) CUMULATIVE**
915	8.08	3.276	467.5	1.08	13.45	-83.5	-	0.5
920	8.03	3.294	239.1	1.01	13.44	-140.4	-	0.7
925	7.96	3.297	94.3	0.95	13.39	-174.2	-	0.9
930	7.92	3.297	51.5	0.92	13.50	-152.4	-	1.1
935	7.83	3.306	40.9	0.88	13.47	-115.8	-	1.3
940	7.80	3.316	35.1	0.86	13.47	-125.3	-	1.5
945	7.78	3.316	22.3	0.86	13.45	-121.6	-	1.7
950	7.77	3.319	19.1	0.85	13.45	-126.8	-	1.9
955	7.76	3.319	22.4	0.84	13.40	-128.7	-	2.1
1000	7.74	3.316	18.9	0.84	13.38	-135.9	-	2.3
1005	7.72	3.328	15.1	0.85	13.39	-142.9		2.5
END PURGE								

Notes/Remarks

LF=LOW FLOW, PP=PERI PUMP
COLLECTED VOCs, SVOCs, PCBs, PESTs, METALS (DISS & TOT)
DUE TO WELL DIA., UNABLE TO MEASURE DTW DURING PURGE
1030 SAMPLE TIME

GROUND WATER SAMPLE FIELD INFORMATION FORM

Site: 450 UNION ST	Well#/Location: SB/MW-1	Job No.	170301701
Date: 5/12/14	Weather: SUNNY, 90s	Sampling Personnel:	MN

Well Information

Sample ID	MW01-05
Well Depth (ft)	15
Screened Interval (ft)	5-15
Casing Elevation (msl)	-
Casing Diameter (in)	1
Depth to Water (ft)	7.24 @ 1310
Water Elevation (msl)	-
Casing Volume (gal)	-
PID/FID Reading (ppm)	0.0

Purging Information

Purging Method	LF, PP
Purging Rate (l/m; gpm)	151 mL/min
Start Purge Time	1329
End Purge Time	1340
Volume Purged (gal)	0.2

Sampling Information

Sampling Method	LF, PP
Start Sampling Time	1345
End Sampling Time	1515
Depth Before Sampling (ft)	-
Number Bottles Collected	8

	Parameters							
Sample Time	pH	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	ORP (mV)	Depth to Water (ft)	Purged Volume (gallons)
1335	7.16	0.855	416.4	4.12	17.07	-26.1	-	0.2
1340	DRY	—	—	—	—	—	12.81	—
END PURGE								

Notes/Remarks

LF = LOW FLOW, PP = PERI PUMP
COLLECTED VOCs, SVOCs, PCBs, PESTICIDES, METALS (DISS & TOTAL)
* 1340 WELL DRY, SAMPLE WITHOUT PURGE
1340 SAMPLE TIME

GROUND WATER SAMPLE FIELD INFORMATION FORM

Site: 450 UNION	Well#/Location: SB/MW-3	Job No. 17030120
Date: 5/7/2014	Weather: RAIN, 50s	Sampling Personnel:

Well Information

Sample ID	MW03_050814
Well Depth (ft)	15
Screened Interval (ft)	5-15
Casing Elevation (msl)	-
Casing Diameter (in)	1
Depth to Water (ft)	INITIAL 8.91 / AFTER PURGE
Water Elevation (msl)	-
Casing Volume (gal)	-
PID/FID Reading (ppm)	0.0

Purging Information

Purging Method	LF
Purging Rate (l/m; gpm)	0.05 gpm 227 mL/min
Start Purge Time	927
End Purge Time	1036
Volume Purged (gal)	3.45

Sampling Information

Sampling Method	PP
Start Sampling Time	1040
End Sampling Time	1107
Depth Before Sampling (ft)	-
Number Bottles Collected	11

	Parameters							
Sample Time	pH ± 0.1	Conductivity (mS/cm) ± 3%	Turbidity (NTU) ± 10%	Dissolved Oxygen (mg/L) ±10%	Temp (°C) ± 3%	ORP (mV) ± 10 mV	Depth to Water (ft) <3ft	Purged Volume (gallons) MIN
937	6.93	3.461	702.4	0.94	13.35	-98.2	N/A	0.05
942	6.99	3.400	310.8	0.74	13.29	-113.7	-	0.05
947	7.00	3.360	142.2	0.67	13.29	-116.9	-	0.05
952	7.03	3.339	174.9	0.61	13.29	-121.1	-	0.05
957	6.99	3.305	368.9	0.57	13.28	-120.3	-	0.05
1002	6.96	3.297	572.4	0.55	13.30	-119.1	-	0.05
1007	6.95	3.292	686.9	0.53	13.27	-120.2	-	0.05
1012	6.95	3.277	700.3	0.51	13.30	-121.4	-	0.05
1017	6.96	3.278	573.8	0.50	13.31	-122.6	-	0.05
1023	6.97	3.272	440.0	0.50	13.34	-121.6	-	0.05
1027	6.96	3.269	388.7	0.50	13.32	-120.8	-	0.05
1036	6.94	3.258	339.2	0.56	13.31	-115.0	-	0.05
END PURGE								

Notes/Remarks

SB03_050814 SAMPLE TIME 1040

GROUND WATER SAMPLE FIELD INFORMATION FORM

Site: 420 UNION ST	Well#/Location: SB/MW-4	Job No.	17030201
Date: 5/12/14	Weather: SUNNY, 80s	Sampling Personnel:	MN

Well Information

Sample ID	MW04-051214
Well Depth (ft)	15
Screened Interval (ft)	5-15
Casing Elevation (msl)	-
Casing Diameter (in)	1
Depth to Water (ft)	9.23 @ 1100
Water Elevation (msl)	-
Casing Volume (gal)	-
PID/FID Reading (ppm)	0.0

Purging Information

Purging Method	LF, PP
Purging Rate (l/m; gpm)	~220 ml/min
Start Purge Time	1113
End Purge Time	1215
Volume Purged (gal)	3.65

Sampling Information

Sampling Method	LF, PP
Start Sampling Time	1216
End Sampling Time	1240
Depth Before Sampling (ft)	-
Number Bottles Collected	11

	± 0.1	± 3%	± 10%	± 10%	Parameters ± ~~0.3~~	± 10	<3	
Sample Time	**pH**	**Conductivity (mS/cm)**	**Turbidity (NTU)**	**Dissolved Oxygen (mg/L)**	**Temp (°C)**	**ORP (mV)**	**Depth to Water (ft)**	**Purged Volume (gallons) cumm.**
1120	6.98	5.594	493.9	0.91	15.59	-79.5	-	0.35
1125	6.95	5.619	168.2	0.66	14.81	-94.0	-	0.65
1130	6.94	5.656	88.7	0.60	14.58	-100.6	-	1.00
1135	6.94	5.680	60.4	0.55	14.54	-99.7	-	1.30
1140	6.94	5.703	47.4	0.53	14.47	-100.3	-	1.60
1145	6.94	5.732	37.8	0.52	14.41	-99.4	-	2.00
1150	6.94	5.745	14.1	0.52	14.61	-103.9	-	2.30
1155	6.94	5.780	9.4	0.51	14.78	-100.4	-	2.60
1200	6.94	5.801	10.6	0.50	14.80	-96.6	-	2.90
1205	6.93	5.810	7.3	0.50	14.83	-101.7	-	3.15
1210	6.93	5.843	7.2	0.50	14.77	-43.8	-	3.40
1215	6.93	5.854	5.4	0.50	14.62	-100.1	-	3.65
END PURGE								

Notes/Remarks

LF = LOW FLOW, PP = PERI PUMP

COLLECTED FOR VOCs, SVOCs, PCBs, PESTICIDES, METALS (DISS & TOTAL)

DUE TO WELL DIA., UNABLE TO MEASURE DTW DURING PURGE

1240 SAMPLE TIME

GROUND WATER SAMPLE FIELD INFORMATION FORM

Site: 450 UNION ST	Well#/Location: SB/MW-5	Job No.	170301201
Date: 5/12/14	Weather: SUNNY, 70s	Sampling Personnel:	MN

Well Information

Sample ID	MW05-051214
Well Depth (ft)	15
Screened Interval (ft)	5-15
Casing Elevation (msl)	–
Casing Diameter (in)	1
Depth to Water (ft)	10.84 @ 1017
Water Elevation (msl)	–
Casing Volume (gal)	–
PID/FID Reading (ppm)	0.0

Purging Information

Purging Method	LF/PP
Purging Rate (l/m; gpm)	57 mL/min
Start Purge Time	~~1057 MN~~ 1300
End Purge Time	~~1445 MN~~ 1320
Volume Purged (gal)	0.25

Sampling Information

Sampling Method	LF/PP
Start Sampling Time	1445
End Sampling Time	1545
Depth Before Sampling (ft)	–
Number Bottles Collected	8

	Parameters							
Sample Time	pH ±0.1	Conductivity (mS/cm) ±3%	Turbidity (NTU) ±10%	Dissolved Oxygen (mg/L) ±10%	Temp (°C) ±3%	ORP (mV) ±10	Depth to Water (ft) <3	Purged Volume (gallons)
1315	7.05	7.848	692.2	4.18	17.26	13.5	–	
1320	7.06	7.686	554.0	4.84	17.76	-35.4	–	0.25
1325	END PURGE							

Notes/Remarks

LF= LOW FLOW, PP = PERI PUMP (GEO PUMP)
COLLECTED VOCs, SVOCs, PCBs, PESTICIDES, METALS (TOTAL & DISS)
DUE TO WELL DIA. COULD NOT MEASURE DTW DURING PURGE
*1303 WELL RAN DRY, RESTART PURGE AT 1313 @ 80mL/MIN, 1315 DRY
1450 SAMPLE TIME

GROUND WATER SAMPLE FIELD INFORMATION FORM

Site: 450 UNION ST	Well#/Location: SB/MW-6	Job No.	17030120J
Date: 5/12/2014	Weather: SUNNY, 70s	Sampling Personnel:	MN

Well Information

Sample ID	~~SB~~ MW06-05~~12~~14
Well Depth (ft)	15
Screened Interval (ft)	5-15
Casing Elevation (msl)	–
Casing Diameter (in)	1
Depth to Water (ft)	10.17 @ 930
Water Elevation (msl)	–
Casing Volume (gal)	–
PID/FID Reading (ppm)	0.0

Purging Information

Purging Method	LF/PP
Purging Rate (l/m; gpm)	230mL/min
Start Purge Time	~~936~~ MN 939
End Purge Time	1021
Volume Purged (gal)	3.00

Sampling Information

Sampling Method	LF/PP
Start Sampling Time	1022
End Sampling Time	1050
Depth Before Sampling (ft)	–
Number Bottles Collected	11

	Parameters							
Sample Time	pH ± 0.1	Conductivity (mS/cm) ± 3%	Turbidity (NTU) ± 10%	Dissolved Oxygen (mg/L) ± 10%	Temp (°C) ± 3%	ORP (mV) ±1 cmV	Depth to Water (ft) <3	Purged Volume (gallons) CUMULATIVE
946	6.58	4.095	~~46.6~~ MN	4.97	13.49	234.3	–	0.5
951	6.59	4.078	127.2	5.00	13.23	228.2	–	1.0
956	6.61	4.083	60.6	5.06	13.53	222.6	–	1.3
1001	6.62	4.078	7.5	4.88	13.32	217.4	–	1.7
1006	6.63	4.077	3.5	4.85	13.20	214.1	–	2.1
1011	6.65	4.095	2.2	4.85	13.78	209.7	–	2.5
1016	6.66	4.144	1.2	4.71	13.68	207.7	–	2.75
1021	6.66	4.201	1.0	4.71	13.63	204.7	–	3.00
STOP PURGE								
		MN						

Notes/Remarks

LF = LOW FLOW
PP = PERI PUMP (GEOPUMP)

1050 SAMPLE TIME

COLLECTED VOCs, SVOCs, PCBs, PESTICIDES, METALS (TOT & DISS)
PURGE WATER CLEAR - INITIAL
952 LOWERED PURGE RATE IN ATTEMPT TO BRING DOWN DO & TURB

DUE TO WELL DIAMETER, DTW COULD NOT BE MEASURED DURING PURGE

GROUND WATER SAMPLE FIELD INFORMATION FORM

Site: 450 UNION ST	Well#/Location: SB/MW-7	Job No. 170301201
Date: 5/12/13	Weather: SUNNY, 80s	Sampling Personnel: MN

Well Information

Sample ID	MW07
Well Depth (ft)	15
Screened Interval (ft)	5-15
Casing Elevation (msl)	-
Casing Diameter (in)	1
Depth to Water (ft)	8.23 @1557
Water Elevation (msl)	-
Casing Volume (gal)	-
PID/FID Reading (ppm)	0.0

Purging Information

Purging Method	LF, PP
Purging Rate (l/m; gpm)	180 mL/min
Start Purge Time	1558
End Purge Time	1655
Volume Purged (gal)	2.4

Sampling Information

Sampling Method	LF, PP
Start Sampling Time	1655
End Sampling Time	1725
Depth Before Sampling (ft)	-
Number Bottles Collected	11

	±0.1	± 3%	±10%	Parameters				
Sample Time	pH	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <3	Purged Volume (gallons) CUMULATIVE
1605	8.43	1.709	621.3	3.88	13.79	57.9	-	0.25
1610	8.49	1.757	301.9	3.22	12.84	27.3	-	~~0.75~~ 0.5
1615	8.35	1.855	353.5	4.85	12.97	11.6	-	0.75
1620	8.30	2.001	136.3	4.83	13.02	-7.5	-	1
1625	8.29	2.037	96.9	5.43	13.02	-8.4	-	1.20
1630	8.28	2.114	43.4	4.38	12.92	-12.6	-	1.40
1635	8.22	2.204	36.0	3.95	12.81	-19.6	-	1.60
1640	8.19	2.267	26.2	3.89	12.74	-26.3	-	1.80
1645	8.19	2.308	25.0	4.30	13.14	-26.8	-	2
1650	8.18	2.363	34.5	4.16	12.81	-24.1	-	2.20
1655	8.12	2.403	22.7	4.16	12.75	-29.5	-	2.4
END PURGE								

Notes/Remarks

LF = LOW FLOW, PP = PERI PUMP
COLLECTED VOCs, SVOCs, PCBs, PESTICIDES, METALS (DISS & TOTAL)
DUE TO WELL DIA., UNABLE TO MEASURE DTW DURING PURGE
WATER, CLOUDY - BROWN/CLAY
INITIAL PURGE, 1611 - WELL BEGINNING TO DRY
LOWER TUBING, REDUCE FLOWSPEED
1725 SAMPLE TIME

APPENDIX E

SOIL VAPOR SAMPLING LOG SHEET

Sample Number: SV02-050914

PROJECT: 450 UNION ST	PROJECT NO.: 170301201
LOCATION: ~~SV-2~~ MN 450 UNION ST, BROOKLYN	SURFACE ELEVATION AND DATUM:
DRILLING FIRM OR LANGAN INSTALLER: ADT	INSTALLATION DATE STARTED: 5/8/2014 DATE FINISHED: 5/8/2014
INSTALLATION FOREMAN: CHRIS IODICE	SAMPLE DATE STARTED: 5/9/2014 DATE FINISHED: 5/9/2014
INSTALLATION EQUIPMENT: DPT	TYPE OF SAMPLING DEVICE: VAPOR PROBE
INSPECTOR: MN	SAMPLER: MN
POTENTIAL SAMPLE INTERFERENCES:	WEATHER CONDITIONS (PRECIP., TEMP., PRESS., WIND SPEED AND DIR.): CLOUDY, 50s, 20 in Hg

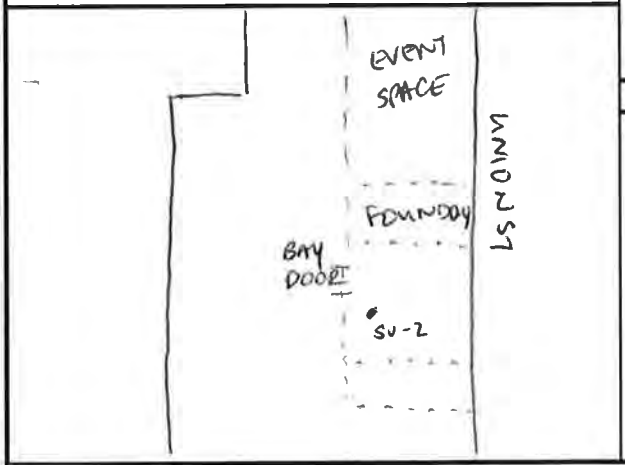
METHOD OF INSTALLATION AND PURGING: DIRECT PUSH OF 2 1/4" CASING TO 7 FT BGS. PROBE W/TUBING INSTALLED THROUGH CASINGS.

TUBING TYPE/DIAMETER: PE / 3/16" ID	TYPE OF MATERIAL ABOVE SEAL:
IMPLANT SCREEN TYPE/LENGTH/DIAMETER: 6" / 1/4" DIA / STAINLESS STEEL	SEAL MATERIAL (Bentonite, Beeswax, Modeling Clay, etc.): BENTONITE
BOREHOLE DIAMETER:	FILTER PACK MATERIAL (Sand or Glass Beads): SAND

PURGE VOLUME (L):	0.42	
PURGE FLOW RATE (ML/MIN):	200 mL/MIN	
PID AFTER PURGE (PPM):	0.8	
HELIUM TEST IN BUCKET(%):	Before Sample: 10.5	After Sample: 9.6
HELIUM TEST IN TUBE (PPM):	Before Sample: 0.0	After Sample: 0.0
SAMPLE START DATE/TIME:	5/9/2014	925
SAMPLE STOP DATE/TIME:	5/9/2014	1130
TOTAL SAMPLE TIME (MIN):	125	
FLOW RATE (L/MIN):	0.05	
VOLUME OF SAMPLE (LITERS):	1	
PID AFTER SAMPLE (PPM):	1.8	
SAMPLE MOISTURE CONTENT:	-	
CAN SERIAL NUMBER:	483	
REGULATOR SERIAL NUMBER:	0401	
CAN START VACUUM PRESS. (" HG):	-29.72	
CAN STOP VACUUM PRESS. (" HG):	-6.28	

IMPLANT/PROBE DETAILS (SEAL, FILTER, ETC.)	DEPTH (FEET FROM SURFACE)	NOTES
SURFACE		
	0-6	BENTONITE
Top of Seal		
Top of Pack		
	6-7	SAND
	7	

SAMPLE LOCATION SKETCH



NOTES

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor, New York, New York 10001-2727

SOIL VAPOR SAMPLING LOG SHEET

Sample Number: SV01_050814

PROJECT: 450 UNION ST	PROJECT NO.: 170301201
LOCATION: 450 UNION ST, BROOKLYN	SURFACE ELEVATION AND DATUM: -
DRILLING FIRM OR LANGAN INSTALLER: ADT	INSTALLATION DATE STARTED: 5/8/2014 DATE FINISHED: 5/8/2014
INSTALLATION FOREMAN: CHRIS IODICE	SAMPLE DATE STARTED: 5/8/2014 DATE FINISHED: 5/8/2014
INSTALLATION EQUIPMENT: DPT	TYPE OF SAMPLING DEVICE: VAPOR PROBE
INSPECTOR: MN	SAMPLER: MN
POTENTIAL SAMPLE INTERFERENCES:	WEATHER CONDITIONS (PRECIP., TEMP., PRESS., WIND SPEED AND DIR.): RAIN, 50s, 29.97in

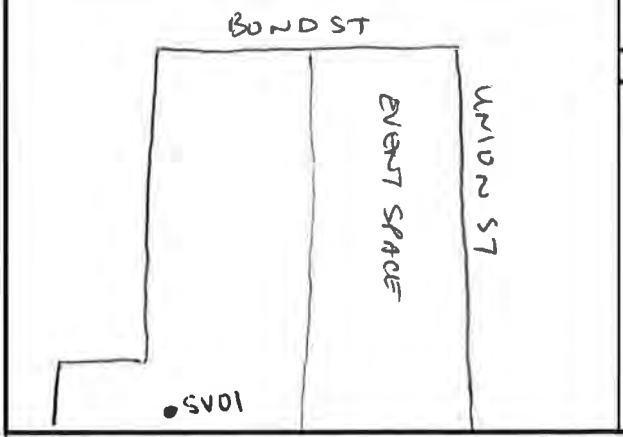
METHOD OF INSTALLATION AND PURGING:
DIRECT PUSH OF 2 1/4" CASING TO 7 FT BGS. PROBE W/TUBING INSTALLED THROUGH CASINGS.

TUBING TYPE/DIAMETER: PE, 3/16" DIA.	TYPE OF MATERIAL ABOVE SEAL: -
IMPLANT SCREEN TYPE/LENGTH/DIAMETER: STAINLESS STEEL, 6" VAPOR PROBE, 1/4" DIA.	SEAL MATERIAL (Bentonite, Beeswax, Modeling Clay, etc.): BENTONITE
BOREHOLE DIAMETER: 2 1/4"	FILTER PACK MATERIAL (Sand or Glass Beads): SAND

PURGE VOLUME (L):	0.42
PURGE FLOW RATE (ML/MIN):	200 ML/MIN
PID AFTER PURGE (PPM):	0.8
HELIUM TEST IN BUCKET(%):	Before Sample: 13.5 / After Sample: 11.6
HELIUM TEST IN TUBE (PPM):	Before Sample: 0.0 / After Sample: 0.0
SAMPLE START DATE/TIME:	5/8/2014 1335
SAMPLE STOP DATE/TIME:	5/8/2014 1550
TOTAL SAMPLE TIME (MIN):	135
FLOW RATE (L/MIN):	0.05
VOLUME OF SAMPLE (LITERS):	6
PID AFTER SAMPLE (PPM):	0.0
SAMPLE MOISTURE CONTENT:	-
CAN SERIAL NUMBER:	155
REGULATOR SERIAL NUMBER:	0627
CAN START VACUUM PRESS. (" HG):	-29.97
CAN STOP VACUUM PRESS. (" HG):	-5.27

IMPLANT/PROBE DETAILS (SEAL, FILTER, ETC.)	DEPTH (FEET FROM SURFACE)	NOTES
SURFACE / SURFACE		
Top of Seal	0-6	BENTONITE
Top of Pack	6-7	SAND
	7'	

SAMPLE LOCATION SKETCH



NOTES

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21 Penn Plaza, 360 West 31st Street, 8th Floor, New York, New York 10001-2727

SOIL VAPOR SAMPLING LOG SHEET

Sample Number: SV03-050814

PROJECT: 450 UNION ST	PROJECT NO.: 170301201
LOCATION: 450 UNION ST, BROOKLYN	SURFACE ELEVATION AND DATUM: -
DRILLING FIRM OR LANGAN INSTALLER: ADT	INSTALLATION DATE STARTED: 5/7/2014 DATE FINISHED: 5/7/2014
INSTALLATION FOREMAN: CHRIS IODICE	SAMPLE DATE STARTED: 5/8/2014 DATE FINISHED: 5/8/2014
INSTALLATION EQUIPMENT: DPT	TYPE OF SAMPLING DEVICE: VAPOR PROBE
INSPECTOR: MN	SAMPLER: MN
POTENTIAL SAMPLE INTERFERENCES:	WEATHER CONDITIONS (PRECIP., TEMP., PRESS., WIND SPEED AND DIR.): RAIN, 50s, 29.97 in. Hg

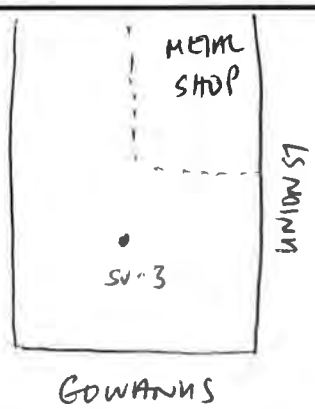
METHOD OF INSTALLATION AND PURGING:
DIRECT PUSH OF 2¼" CASING TO 7 FT BGS. PROBE W/TUBING INSTALLED THROUGH CASING. CASINGS PULLED. FILL WITH 3-4" #2 SAND ABOVE PROBE AND SEALED

TUBING TYPE/DIAMETER: PE / 3/16" ID	TYPE OF MATERIAL ABOVE SEAL:
IMPLANT SCREEN TYPE/LENGTH/DIAMETER: STAINLESS STEEL / 6" / 1¼" DIA	SEAL MATERIAL (Bentonite, Beeswax, Modeling Clay, etc.): BENTONITE
BOREHOLE DIAMETER: 2¼"	FILTER PACK MATERIAL (Sand or Glass Beads): SAND

PURGE VOLUME (L):	0.42	
PURGE FLOW RATE (ML/MIN):	200 mL/MIN	
PID AFTER PURGE (PPM):	2.7	
HELIUM TEST IN BUCKET(%):	Before Sample: 15.6	After Sample: 10.6
HELIUM TEST IN TUBE (PPM):	Before Sample: 0.0	After Sample: 0.0
SAMPLE START DATE/TIME:	5/8/2014	1035
SAMPLE STOP DATE/TIME:	5/8/2014	1235
TOTAL SAMPLE TIME (MIN):	120	
FLOW RATE (L/MIN):	0.05	
VOLUME OF SAMPLE (LITERS):	~6 L	
PID AFTER SAMPLE (PPM):	0.2	
SAMPLE MOISTURE CONTENT:	-	
CAN SERIAL NUMBER:	444	
REGULATOR SERIAL NUMBER:	0174	
CAN START VACUUM PRESS. (" HG):	-30.15	
CAN STOP VACUUM PRESS. (" HG):	-4.88	

IMPLANT/PROBE DETAILS (SEAL, FILTER, ETC.)	DEPTH (FEET FROM SURFACE)	NOTES
SURFACE		
	0-6'	
		BENTONITE
Top of Seal		
Top of Pack		
	6-7'	#2 SAND
	7'	

SAMPLE LOCATION SKETCH



NOTES

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